UNITED STATES
SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM 10-K

(Mark One)

☒ **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the fiscal year ended December 31, 2023

OR

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the transition period from _____ to _____

Commission File Number 001-39323

VAXCYTE, INC.

(Exact name of Registrant as specified in its Charter)

Delaware	**46-4233385**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification No.)**
825 Industrial Road, Suite 300	
San Carlos, California	**94070**
(Address of principal executive offices)	**(Zip Code)**

Registrant's telephone number, including area code: (650) 837-0111

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	**Trading Symbol(s)**	**Name of each exchange on which registered**
Common Stock, $0.001 par value per share	PCVX	The Nasdaq Stock Market

Securities registered pursuant to Section 12(g) of the Act: None

Indicate by check mark if the Registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. YES ☒ NO ☐

Indicate by check mark if the Registrant is not required to file reports pursuant to Section 13 or 15(d) of the Act. YES ☐ NO ☒

Indicate by check mark whether the Registrant: (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the Registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. YES ☒ NO ☐

Indicate by check mark whether the Registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the Registrant was required to submit such files). YES ☒ NO ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer	☒	Accelerated filer	☐
Non-accelerated filer	☐	Smaller reporting company	☐
Emerging growth company	☐		

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report. ☒

If securities are registered pursuant to Section 12(b) of the Act, indicate by check mark whether the financial statements of the registrant included in the filing reflect the correction of an error to previously issued financial statements. ☐

Indicate by check mark whether any of those error corrections are restatements that required a recovery analysis of incentive-based compensation received by any of the registrant's executive officers during the relevant recovery period pursuant to §240.10D-1(b). ☐

Indicate by check mark whether the Registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). YES ☐ NO ☒

The aggregate market value of the voting and non-voting common equity held by non-affiliates of the Registrant, based on the closing price of its Common Stock on the Nasdaq Global Select Market on June 30, 2023, the last business day of the Registrant's most recently completed second fiscal quarter, was approximately $4.1 billion. Shares of the Registrant's common stock held by each executive officer, director and holder of 10% or more of the outstanding common stock have been excluded in that such persons may be deemed to be affiliates. This calculation does not reflect a determination that certain persons are affiliates of the Registrant for any other purpose.

The number of shares of Registrant's Common Stock outstanding as of February 23, 2024 was 108,407,730.

DOCUMENTS INCORPORATED BY REFERENCE

Part III of this Annual Report on Form 10-K incorporates information by reference from the Registrant's definitive proxy statement to be filed with the U.S. Securities and Exchange Commission pursuant to Regulation 14A, not later than 120 days after the end of the fiscal year covered by this Annual Report on Form 10-K, in connection with the Registrant's 2024 annual meeting of stockholders.

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Unless the context otherwise requires, all references in this Annual Report on Form 10-K to "we," "us," "our," "our company" and "Vaxcyte" refer to Vaxcyte, Inc.

"Vaxcyte," "eCRM," and other trademarks of ours appearing in this report are our property. This report contains additional trade names and trademarks of other companies. We do not intend our use or display of other companies' trade names or trademarks to imply an endorsement or sponsorship of us by such companies, or any relationship with any of these companies.

Special Note Regarding Forward-Looking Statements

This Annual Report on Form 10-K contains forward-looking statements about us and our industry that involve substantial risks and uncertainties. All statements other than statements of historical facts contained in this Annual Report on Form 10-K, including statements regarding our future results of operations or financial condition, business strategy and plans and objectives of management for future operations, are forward-looking statements. In some cases, you can identify forward-looking statements because they contain words such as "anticipate," "believe," "contemplate," "continue," "could," "estimate," "expect," "intend," "may," "plan," "potential," "predict," "project," "seek," "should," "target," "will," or "would," or the negative of these words or other similar terms or expressions. Forward-looking statements contained in this Annual Report on Form 10-K include, but are not limited to, statements about:

- our expectations regarding the potential benefits, spectrum of coverage and immunogenicity of our vaccine candidates;
- our expectations regarding our preclinical study results potentially being predictive of clinical study results;
- our belief that our pneumococcal conjugate vaccine candidates could receive regulatory approval based on a demonstration of non-inferiority to the standard-of-care using well-defined surrogate immune endpoints rather than requiring clinical field efficacy studies;
- the timing of the initiation, progress and potential results of our preclinical studies, clinical trials and our research and development programs;
- our ability to advance vaccine candidates into, and successfully complete, preclinical studies and clinical trials;
- the commercialization of our vaccine candidates, if approved;
- estimates of our future expenses, capital requirements and our needs for additional financing;
- our ability to compete effectively with existing competitors and new market entrants;
- our ability to establish and maintain intellectual property protection for our products or avoid claims of infringement;
- our and our third-party manufacturers' manufacturing capabilities and the scalable nature of our manufacturing process;
- potential effects of extensive government regulation;
- the pricing, coverage and reimbursement of our vaccine candidates, if approved;
- our ability to hire and retain key personnel;
- our ability to obtain additional financing; and
- the volatility of the trading price of our common stock.

Actual events or results may differ from those expressed in forward-looking statements. You should not rely on forward-looking statements as predictions of future events. We have based the forward-looking statements contained in this Annual Report on Form 10-K primarily on our current expectations and projections about future events and trends that we believe may affect our business, financial condition and operating results. The outcome of the events described in these forward-looking statements is subject to risks, uncertainties and other factors described in the section titled "Risk Factors" and elsewhere in this Annual Report on Form 10-K. Moreover, we operate in a very competitive and rapidly changing environment. New risks and uncertainties emerge from time to time, and it is not possible for us to predict all risks and uncertainties that could have an impact on the forward-looking statements contained in this Annual Report on Form 10-K. The results, events and circumstances reflected in the forward-looking statements may not be achieved or occur, and actual results, events or circumstances could differ materially from those described in the forward-looking statements.

In addition, statements that "we believe" and similar statements reflect our beliefs and opinions on the relevant subject. These statements are based on information available to us as of the date of this Annual Report on Form 10-K. While we believe that information provides a reasonable basis for these statements, that information may be limited or incomplete. Our statements should not be read to indicate that we have conducted an exhaustive inquiry into, or review of, all relevant information. These statements are inherently uncertain, and investors are cautioned not to unduly rely on these statements.

The forward-looking statements made in this Annual Report on Form 10-K relate only to events as of the date on which the statements are made. We undertake no obligation to update any forward-looking statements made in this Annual Report on Form 10-K to reflect events or circumstances after the date of this Annual Report on Form 10-K or to reflect new information or the occurrence of unanticipated events, except as required by law. We may not actually achieve the plans, intentions or expectations disclosed in our forward-looking statements, and you should not place undue reliance on our forward-looking statements. Our forward-looking statements do not reflect the potential impact of any future acquisitions, mergers, dispositions, joint ventures or investments.

Summary of Risks Affecting Our Business

Our business is subject to numerous risks and uncertainties, including those discussed more fully in the section titled "Risk Factors" in this Annual Report on Form 10-K. These risks include, but are not limited to, the following:

- We are in the clinical or preclinical stages of vaccine development and have a very limited operating history and no products approved for commercial sale, which may make it difficult for you to evaluate the success of our business to date and to assess our future viability.
- We have incurred significant net losses since inception and anticipate that we will continue to incur substantial net losses for the foreseeable future. We currently have no source of product revenue and may never achieve profitability. Our stock is a highly speculative investment.
- We will require substantial additional funding to finance our operations, which may not be available to us on acceptable terms, or at all. If we are unable to raise additional capital when needed, we could be forced to delay, reduce or terminate certain of our development programs or other operations.
- Our approach to the discovery and development of our vaccine candidates is based on novel technologies that are unproven, which may expose us to unforeseen risks, require us to modify processes, and make it difficult to predict the time and cost of vaccine candidate development and the timing to apply for and obtain regulatory approvals.
- Our vaccine candidates are in clinical or preclinical stages of development and may fail in development or suffer delays that materially and adversely affect their commercial viability. If we are unable to complete development of or commercialize our vaccine candidates or experience significant delays in doing so, our business would be materially harmed.
- The U.S. Food and Drug Administration may disagree with our regulatory plan, and we may fail to obtain regulatory approval of our vaccine candidates.
- Our business is highly dependent on the success of our PCV candidates, VAX-24 and VAX-31, both of which are in clinical development. If we are unable to successfully develop, obtain approval for and effectively commercialize VAX-24 or VAX-31, our business would be significantly harmed.
- Our primary competitors have significantly greater resources and experience than we do, which may make it difficult for us to successfully develop and commercialize our vaccine candidates, or may result in others discovering, developing or commercializing products before or more successfully than us.
- We may not be successful in our efforts to use our cell-free protein synthesis platform to expand our pipeline of vaccine candidates and develop marketable products.
- We currently rely on third-party manufacturing and supply partners, including Lonza Ltd. and Sutro Biopharma, Inc., to supply raw materials and components for, and the manufacture of, our preclinical and clinical supplies as well as our vaccine candidates. Our inability to procure necessary raw materials

or to have sufficient quantities of preclinical and clinical supplies or the inability to have our vaccine candidates manufactured, including delays or interruptions at our third-party manufacturers, or our failure to comply with applicable regulatory requirements or to supply sufficient quantities at acceptable quality levels or prices, or at all, would materially and adversely affect our business.

- The FDA regulatory approval process is lengthy and time-consuming, and we may experience significant delays in the clinical development and regulatory approval of our vaccine candidates.
- If we are unable to obtain and maintain patent protection for our technology and products, or if the scope of the patent protection obtained is not sufficiently broad, we may not be able to compete effectively in our markets.

PART I

Item 1. Business.

Overview

We are a clinical-stage vaccine innovation company engineering high-fidelity vaccines to protect humankind from the consequences of bacterial diseases. We are developing broad-spectrum conjugate and novel protein vaccines to prevent or treat bacterial infectious diseases. We are re-engineering the way highly complex vaccines are made through modern synthetic techniques, including advanced chemistry and the XpressCF™ cell-free protein synthesis platform, exclusively licensed from Sutro Biopharma, Inc. ("Sutro Biopharma"). Unlike conventional cell-based approaches, our system for producing difficult-to-make proteins and antigens is intended to accelerate our ability to efficiently create and deliver high-fidelity vaccines with enhanced immunological benefits.

Vaccines are one of the most successful and cost-effective global health interventions and prevent millions of deaths worldwide each year. Routine pediatric vaccinations in the United States are estimated to prevent 20 million cases of disease each year, and it is estimated that every $1 spent on childhood vaccination saves $10 from a societal perspective. Adult vaccination rates are lower than pediatric vaccination rates, but new technologies are driving adult vaccine development, which in turn is fueling the growth of the overall vaccine market. Given the critical role vaccines play in preventing disease from childhood to adulthood, the global vaccine market is large, durable and growing. There are areas of significant unmet medical need, including vaccines that can provide broader protection than currently marketed vaccines and novel vaccines that target pathogens for which there are no currently approved vaccines. We are driven to eradicate or treat invasive bacterial infections, which have serious and costly health consequences when left unchecked.

We carefully select our target disease areas and vaccine candidates based on the following criteria: areas of significant unmet medical need, clear commercial opportunity and efficient market adoption, acceptable biological risk and established or acceptable clinical pathways. We are leveraging our scalable cell-free protein synthesis platform to develop potentially superior and novel conjugate and protein vaccine candidates for adult and pediatric indications using these criteria.

Our pipeline includes:

- Pneumococcal conjugate vaccine ("PCV") candidates that we believe are among the most broad-spectrum PCV candidates currently in development, targeting the approximately $8 billion global pneumococcal vaccine market. Pneumococcal disease is an infection caused by *Streptococcus pneumoniae* ("Pneumococcus") bacteria. It can result in invasive pneumococcal disease ("IPD"), including meningitis and bacteremia, and non-invasive pneumococcal disease, including pneumonia, otitis media and sinusitis. Our broad-spectrum, carrier-sparing PCV candidates, VAX-24 and VAX-31, are designed to improve upon the standard-of-care PCVs for both children and adults by covering the serotypes that are responsible for a significant portion of IPD in circulation and are associated with high case-fatality rates, antibiotic resistance and meningitis, while maintaining coverage of previously circulating strains that are currently contained through continued vaccination practice.
    - Our lead vaccine candidate, VAX-24, is a 24-valent, broad-spectrum, carrier-sparing investigational PCV being developed for the prevention of IPD.
        - VAX-24 Adult Indication:
            - In October 2022, we announced positive topline results from both the Phase 1 and Phase 2 portions of a clinical proof-of-concept study evaluating the safety, tolerability and immunogenicity of VAX-24 in 835 healthy adults aged 18-64. The Phase 1 portion of the study evaluated the safety and tolerability of a single injection of VAX-24 at three dose levels, 1.1mcg, 2.2mcg and 2.2mcg/4.4mcg, and compared to Prevnar 20® ("PCV20"), in 64 healthy adults aged 18-49. The Phase 2 portion evaluated the safety, tolerability and immunogenicity of a single injection of VAX-24 at the same three dose levels and compared to a single injection of PCV20 in 771 healthy adults

aged 50-64. In this study, VAX-24 met the primary safety and tolerability objectives, demonstrating a safety profile similar to PCV20, for all doses studied. In the study, VAX-24 met or exceeded the established regulatory immunogenicity standards for all 24 serotypes at the conventional 2.2mcg dose, which is the dose selected for a potential Phase 3 program. At this dose, VAX-24 met the standard opsonophagocytic activity ("OPA") response non-inferiority criteria for all 20 serotypes common with PCV20, of which 16 achieved higher immune responses. Additionally, at all three doses, VAX-24 met the standard superiority criteria for all four serotypes unique to VAX-24. VAX-24 has the potential to cover an additional 14-26 percent of strains causing IPD in adults over the current standard-of-care PCVs.

- In April 2023, we announced positive results from a Phase 2 study of VAX-24 in adults aged 65 and older, as well as data from the full six-month safety assessment and prespecified pooled immunogenicity analyses from both the Phase 2 study in adults aged 65 and older and the prior Phase 1/2 study in adults aged 18-64. The Phase 2 study in adults aged 65 and older evaluated the safety, tolerability and immunogenicity of a single injection of VAX-24 at three dose levels, 1.1mcg, 2.2mcg and 2.2mcg/4.4mcg, and compared to a single injection of PCV20 in 207 healthy adults aged 65 and older. In this Phase 2 study, VAX-24 demonstrated robust OPA immune responses across all 24 serotypes at all doses studied, confirming the prior Phase 2 adult study results. The VAX-24 2.2mcg dose, which is the dose selected for a potential Phase 3 program, showed an overall improvement in immune responses compared to PCV20 relative to the results from the prior Phase 2 study in adults aged 50-64. The six-month safety data from both adult studies showed safety and tolerability results for VAX-24 similar to PCV20 at all doses studied. Additionally, the prespecified pooled immunogenicity analyses of data from both adult Phase 2 studies showed the VAX-24 2.2mcg dose met the OPA non-inferiority criteria for all 20 serotypes common with PCV20 and the superiority criteria for the four additional serotypes unique to VAX-24.
- The U.S. Food and Drug Administration ("FDA") has granted Fast Track designation and Breakthrough Therapy designation for VAX-24 in adults.
- In October 2023, we completed a successful End-of-Phase 2 meeting with the FDA. The meeting focused on the VAX-24 adult Phase 3 clinical program, including the design of the pivotal, non-inferiority study and other Phase 3 studies needed to support a Biologics License Application ("BLA") submission. Based on the End-of-Phase 2 meeting, we believe there is agreement with the FDA on the clinical design of a potential adult Phase 3 program, including the approximate overall number of subjects, the primary and secondary endpoints for the pivotal, non-inferiority study as well as confirmation that the planned immunogenicity analyses are sufficient to support licensure and a separate efficacy study is therefore not required.
- In January 2024, we announced that we received encouraging input from ongoing discussions with the FDA about the VAX-24 adult program to further inform our chemistry, manufacturing and controls ("CMC") licensure requirements and that we expect to seek additional CMC-focused input from the FDA as we prepare for and potentially conduct our VAX-24 adult Phase 3 program. Following the topline data from the VAX-31 adult Phase 1/2 study, which is expected in the third quarter of 2024, we expect to determine whether to advance VAX-24 or VAX-31 to an adult Phase 3 program. If we move forward with the VAX-24 adult Phase 3 program, we expect to initiate the pivotal, non-inferiority study in adults aged 50 and older in the second half of 2024 and announce topline safety, tolerability and immunogenicity data from this study in the second half of 2025. We would expect to initiate the remaining Phase 3 studies, which are shorter in duration than the non-inferiority study, for VAX-24 in the adult population in 2025 and 2026. If we move forward with the VAX-31 adult Phase 3 program, we expect to initiate the full complement of potential Phase 3 studies in 2025 and 2026. Subject to the results of the adult Phase 3

studies, we would expect to submit a BLA for VAX-24 or VAX-31 shortly following the completion of the last Phase 3 study.

- VAX-24 Pediatric Indication:
  - In March 2023, we announced that the first participants were dosed in the first stage of a Phase 2 study of VAX-24 in healthy infants. The Phase 2 infant study is being conducted in two stages and compares VAX-24 to the broadest-spectrum standard-of-care PCVs currently available. Stage 1 of the study evaluated the safety and tolerability of a single injection of VAX-24 at three dose levels, 1.1mcg, 2.2mcg and 2.2mcg/4.4mcg, and compared to VAXNEUVANCE™ ("PCV15"), the broadest-spectrum standard-of-care PCV at that time, in 48 infants in a dose-escalation approach.
  - In July 2023, we announced that the ongoing Phase 2 study of VAX-24 in healthy infants had advanced to the second and final stage of the study in which we continue to enroll participants. The independent Data Safety Monitoring Board approved advancing to the second stage of the study following the review of the safety and tolerability results from the first stage. Additionally, in agreement with the FDA, we amended the study protocol for Stage 2 of the study, changing the study comparator to PCV20, which became the broadest-spectrum PCV recommended by the Advisory Committee on Immunization Practices ("ACIP") in June 2023. This Phase 2 study is evaluating the safety, tolerability and immunogenicity of VAX-24 in healthy infants at the same three dose levels, 1.1mcg, 2.2mcg and 2.2mcg/4.4mcg, that were evaluated in Stage 1. We expect to share topline data from the primary three-dose immunization series of the study by the end of the first quarter of 2025, followed by topline data from the booster dose by the end of 2025.

- Our second PCV candidate, VAX-31, is the broadest-spectrum PCV to enter the clinic. VAX-31 builds on what has been established with VAX-24 and is designed to expand the breadth of coverage to 31 strains, inclusive of the 24 strains in VAX-24, without compromising immunogenicity due to carrier suppression, and to cover approximately 95% of IPD circulating in the U.S. adult population.
  - In October 2023, we announced the FDA clearance of the investigational new drug ("IND") application for VAX-31 for the prevention of IPD in adults. In November 2023, we announced that the first participants were dosed in a Phase 1/2 clinical study for VAX-31 in adults. The VAX-31 Phase 1/2 clinical study is a randomized, double-blind, active-controlled, dose-finding clinical study designed to evaluate the safety, tolerability and immunogenicity of VAX-31 at three dose levels (low, middle and high) and compared to PCV20 in 1,015 healthy adults aged 50 and older. The Phase 1 portion of the study evaluated the safety and tolerability of a single injection of VAX-31 at three dose levels and compared to PCV20 in 64 healthy adults 50 to 64 years of age. An independent Data Monitoring Committee conducted an assessment of the Phase 1 safety and tolerability results and recommended that the study proceed as planned to Phase 2. Phase 1 participants will also be evaluated for immunogenicity, and the Phase 1 safety, tolerability and immunogenicity data will be pooled with the participants in the Phase 2 portion of the study. The Phase 2 portion of the study will evaluate the safety, tolerability and immunogenicity of a single injection of VAX-31 at the same three dose levels and compared to PCV20 in 951 healthy adults 50 years of age and older. Participants were randomized equally in four separate arms and, 30 days after dosing, serology samples will be collected to assess immunogenicity. The immunogenicity objectives of the study include an assessment of the induction of antibody responses, using OPA and immunoglobulin G ("IgG"), at each of the three VAX-31 doses and compared to PCV20 for the 20 serotypes in common, as well as for the additional 11 serotypes contained in VAX-31, but not in PCV20. Participants in the study are being evaluated for safety through six months after vaccination. The study is being conducted at approximately 25 sites in the United States.

- In January 2024, we announced the completion of enrollment in the Phase 1/2 clinical study evaluating VAX-31 in healthy adults aged 50 and older. We expect to announce topline safety, tolerability and immunogenicity data from the Phase 1/2 study in the third quarter of 2024, following which we expect to determine whether to advance VAX-24 or VAX-31 to an adult Phase 3 program as discussed above.

- VAX-A1, a novel conjugate vaccine candidate designed to prevent disease caused by Group A Streptococcus ("Group A Strep"). Group A Strep is pervasive globally and causes an estimated 800 million cases of illness annually, including pharyngitis, or strep throat, and certain severe invasive infections and sequelae. There is currently no vaccine against Group A Strep, which is one of the leading infectious disease-related causes of death and disability worldwide and a significant contributor to the prescription of antibiotics in the very young. We believe we have demonstrated preclinical proof of concept for VAX-A1, the data for which were published in December 2020. We nominated the final vaccine candidate for VAX-A1 in the first quarter of 2021 and initiated IND-enabling activities in the second half of 2021. We continue to advance the development of VAX-A1 and we intend to provide further information about the anticipated timing of an IND application as the program progresses.
- VAX-PG, a novel protein vaccine candidate targeting the keystone pathogen responsible for periodontitis, a chronic oral inflammatory disease affecting an estimated 65 million adults in the United States. We believe we have generally demonstrated preclinical proof of concept for a periodontitis protein vaccine, the data for which was published in February 2019. We nominated a final vaccine candidate for VAX-PG in 2022 and are conducting large-animal confirmatory studies prior to advancing the program to potential IND-enabling activities. Our initial goal is to develop a therapeutic vaccine to slow or stop disease progression; however, the results from clinical trials may inform the potential adoption of prophylactic immunization.
- VAX-GI, a novel preclinical vaccine candidate being developed as a preventative treatment for dysentery and shigellosis, which is caused by Shigella bacteria. Shigella, a bacterial illness that affects an estimated 188 million people worldwide each year and results in approximately 164,000 deaths annually, mostly among children under five years of age in low- and middle-income settings. The central antigen in VAX-GI is IpaB, a well-appreciated antigen that other developers have been unable to produce in an amount sufficient to enable a commercial product. With our cell-free technology, we believe we can produce this antigen at substantially improved yields, allowing for commercial-scale production. VAX-GI is being developed in collaboration with the University of Maryland, Baltimore as well as with partial funding from two research grants awarded by the National Institutes of Health ("NIH").
- Other discovery-stage programs that leverage our cell-free protein synthesis platform, which, if proven successful in preclinical studies, could also be advanced into IND-enabling activities and clinical studies.

Our modern synthetic techniques, including advanced chemistry and the XpressCF cell-free protein synthesis platform, offer several advantages over conventional cell-based protein expression methods, which we believe enable us to generate superior, novel, more broad-spectrum and/or more immunogenic vaccines. In the context of conjugate vaccines, we believe we can add more antigenic strains without compromising the overall immune response. In particular, our ability to specify the attachment point of antigens, including polysaccharides, on protein carriers represents a significant improvement over the random conjugation that occurs with conventional technologies. This site-specific conjugation is designed to ensure that B-cell and/or T-cell epitopes are optimally exposed, maximizing the immune response, whereas random conjugation blocks these critical immunogenic epitopes, which dampens the immune response and may lead to a phenomenon known as carrier suppression.

We believe this precise control of conjugation chemistry enables us to design broader-spectrum conjugate vaccine candidates using carrier-sparing conjugates that use less protein carrier without sacrificing immunogenicity. We are also able to design novel conjugate vaccine candidates using standard amounts of protein carrier to generate heightened immunogenicity. Beyond conjugate vaccines, we believe we can also design novel protein vaccine candidates based on well-appreciated but highly complex antigens that currently cannot be made using conventional technologies to address diseases for which there are no available vaccines. In addition, our

platform enables us to rapidly screen vaccine candidates, requiring less effort than conventional chemistry which allows us to produce and iterate conjugate candidates, thereby dramatically accelerating the development cycle of designing, producing and testing vaccine candidates.

Our Approach

To address areas of significant unmet medical need, we carefully select the disease areas we target and are developing vaccine candidates based on the following criteria:

- *Clear commercial opportunity and efficient market adoption:* We select vaccine targets that are characterized by an established patient population and significant unmet medical need. Our PCV candidates, VAX-24 and VAX-31, are designed to improve upon the standard-of-care for both children and adults by covering the serotypes that are responsible for a significant portion of IPD in circulation and are associated with high case-fatality rates, antibiotic resistance and meningitis, while maintaining coverage of previously circulating strains that are currently contained through continued vaccination practice. We believe that by providing the broadest coverage of serotypes for PCVs, as well as providing novel vaccines for diseases for which there are no currently approved vaccines, we can leverage the U.S. Centers for Disease Control ("CDC"), ACIP and similar international advisory body recommendations to drive rapid and significant market adoption.

- *Acceptable biological risk:* We choose vaccine targets with well-understood mechanisms of action and strong precedents for positive preclinical study results that we believe will translate to positive clinical trial results. For example, conjugate vaccines have demonstrated effectiveness in both preclinical and clinical trials against a range of bacteria, including Pneumococcus, meningococcus and Haemophilus influenza B. There is consistent evidence that antibodies directed against these bacteria are protective against their respective diseases.

- *Established or acceptable clinical pathways:* We pursue vaccine targets that we believe have established or acceptable clinical development pathways in order to accelerate the potential time to market. For example, we believe that our PCVs would receive regulatory approval based on successful completion of clinical studies utilizing well-defined surrogate immune endpoints, consistent with how other PCVs have obtained regulatory approval in the past, rather than requiring clinical field efficacy studies. Specific to the VAX-24 adult indication, based on our End-of-Phase 2 meeting with the FDA in October 2023, we believe there is agreement with the FDA on the clinical design of a potential adult Phase 3 program, as well as confirmation that the planned immunogenicity analyses are sufficient to support licensure and a field efficacy study is therefore not required. For our novel vaccine candidates, for which we believe clinical field efficacy studies will be necessary, we select disease areas with high attack rates, such as Group A Strep, which may allow for more manageable study sizes. For novel protein-based therapeutic vaccine candidates, such as our periodontitis vaccine candidate, we select disease areas for which we believe clinical efficacy may be evaluated based on disease progression rather than prevention, which could allow for smaller and faster trials relative to preventative vaccines.

Our Platform

We are re-engineering the way highly complex vaccines are made through modern synthetic techniques, including advanced chemistry and the XpressCF cell-free protein synthesis platform to develop potentially superior and novel conjugate and protein vaccine candidates for adult and pediatric indications using the above criteria by taking advantage of the following:

- *Site-Specific Conjugation.* We are able to specify the attachment point of antigens, including polysaccharides, on protein carriers to ensure optimal exposure of B-cell and/or T-cell epitopes, thereby creating protein carriers designed to have enhanced potency. We believe this precise control of conjugation chemistry enables us to create broader-spectrum conjugate vaccine candidates using carrier-sparing conjugates that use less protein carrier without sacrificing

immunogenicity. We are also able to design novel conjugate vaccine candidates using standard amounts of protein carrier to generate heightened immunogenicity.

- *Production of Novel Protein Vaccines*. We can design novel protein vaccine candidates based on well-appreciated but highly complex antigens that currently cannot be made with conventional technologies to address diseases for which there are no available vaccines, and we believe we may be able to leverage our platform to rapidly respond to new or emerging pathogens. We can design and produce these "tough-to-make" antigens that conform to the target pathogens, thereby increasing the likelihood that the vaccine will elicit a protective immune response.

- *Speed, Flexibility and Scalability of the Discovery Engine.* We are able to rapidly screen vaccine candidates and produce conjugates, thereby accelerating the process of making and testing vaccine candidates. Because cell viability is not required for cell-free protein synthesis, we can utilize a broader range of reaction conditions as we seek to optimize proteins. This flexibility enables us to develop novel vaccine candidates unachievable with current technologies. Furthermore, we believe our platform can scale linearly from discovery to commercial scale.

Our Strategy

Our goal is to become a leader in the vaccines industry by using our cell-free protein synthesis platform to develop superior and/or novel vaccines to prevent or treat serious infectious diseases. Key elements of our strategy include:

- *Advance VAX-24 and/or VAX-31 through clinical development and regulatory approval.* Our PCV candidates, VAX-24 and VAX-31, target the pneumococcal vaccine market. We expect to advance these PCV candidates along a well-understood clinical development pathway in an effort to obtain regulatory approval in adults and infants based on successful completion of clinical studies using previously established surrogate immune endpoints, without the need to conduct clinical field efficacy studies, consistent with how other conjugate vaccines have obtained approval.

    - Adult Indication:

        - Following the topline data from the VAX-31 adult Phase 1/2 study, which is expected in the third quarter of 2024, we expect to determine whether to advance VAX-24 or VAX-31 to an adult Phase 3 program. If we move forward with the VAX-24 adult Phase 3 program, we expect to initiate the pivotal, non-inferiority study in adults aged 50 and older in the second half of 2024 and announce topline safety, tolerability and immunogenicity data from this study in the second half of 2025. We would expect to initiate the remaining Phase 3 studies, which are shorter in duration than the non-inferiority study, for VAX-24 in the adult population in 2025 and 2026. If we move forward with the VAX-31 adult Phase 3 program, we expect to initiate the full complement of potential Phase 3 studies in 2025 and 2026. Subject to the results of the adult Phase 3 studies, we would expect to submit a BLA for VAX-24 or VAX-31 shortly following the completion of the last Phase 3 study.

    - Pediatric Indication:

        - In contrast to the adult indication for which we intend to move either VAX-24 or VAX-31 to an adult Phase 3 clinical program and for regulatory approval, for the infant indication, subject to the results of proof-of-concept clinical studies, we may advance VAX-24 followed by VAX-31 to Phase 3 clinical programs and for regulatory approvals.

- *Establish scalable production of VAX-24 and VAX-31.* We believe high-quality and scalable manufacturing is critical to our long-term success. We have designed and developed a proprietary,

scalable and portable manufacturing process that we have scaled to supply clinical volumes and believe can scale to supply initial commercial volumes of VAX-24 and VAX-31 needed to support commercial launch. For our VAX-24 and VAX-31 programs, we have completed the production of clinical trial materials for our Phase 1 and 2 studies in adults and, for our VAX-24 program, we have completed the production of clinical trial materials for our Phase 2 study in infants. For the adult indication, we are conducting scale-up activities to support potential regulatory approval and commercial launch of either VAX-24 or VAX-31. We have access to substantial manufacturing resources through our contract manufacturer, Lonza, that we believe can facilitate an independent path to market. In October 2023, we entered into a new commercial manufacturing agreement with Lonza to support the potential global commercialization of our PCV candidates in both the adult and pediatric populations. This agreement complements our plans to utilize existing Lonza infrastructure to advance clinical development and the anticipated initial U.S. launch of either VAX-24 or VAX-31 for the adult population. In November 2023, we entered into a manufacturing rights agreement with Sutro Biopharma to obtain control over the development and manufacture of cell-free extract, a key component of our PCV franchise. Pursuant to the manufacturing rights agreement, we obtained exclusive rights to independently, or through certain third parties, develop, improve and manufacture cell-free extract for use in connection with our vaccine candidates.

- *Create a long-lasting PCV franchise by offering the broadest-spectrum PCV available.* The two leading pneumococcal vaccine franchises to date, Prevnar and Pneumovax 23 ("PPSV23"), have generated over $100 billion in combined sales, have been on the market for over 20 years and 40 years, respectively, and can attribute their success to being the broadest-spectrum vaccines on the market. If approved, we believe VAX-24 and VAX-31 may obtain ACIP preferred recommendations and potentially replace lesser-valent incumbents for pneumococcal disease prevention in both adult and pediatric populations because of its broader coverage. We designed VAX-24 to address the 24 pneumococcal strains covered by Prevnar and PPSV23 that drive most pneumococcal disease today with the durable, boostable immune response of a conjugate vaccine. Further, we have designed VAX-31 to address these 24 strains plus seven additional epidemiologically significant emerging strains expected to cause increasing pneumococcal disease and antibiotic resistance in the future. With these broad-spectrum vaccine candidates, we believe we are well-positioned to obtain ACIP preferred recommendations and potentially replace the current standard-of-care for pneumococcal disease prevention in both adult and pediatric populations, thereby creating a long-lasting PCV franchise.

- *Advance our novel vaccine candidates and leverage our platform to expand our pipeline.*

    - *Advance VAX-A1 through IND-enabling activities, clinical development and regulatory approval*. VAX-A1 is designed to prevent Group A Strep. Group A Strep is pervasive globally and causes an estimated 800 million cases of illness annually, including pharyngitis, or strep throat, and certain severe invasive infections and sequelae. There is currently no vaccine against Group A Strep, which is one of the leading infectious disease-related causes of death and disability worldwide and a significant contributor to the prescription of antibiotics in the very young. Pharyngitis is highly prevalent in school-age children and a significant source of antibiotic prescriptions, which further exacerbates the growing problem of antibiotic resistance globally. VAX-A1 is a conjugate vaccine candidate designed to confer broad protective immune responses against all subtypes of Group A Strep and be boostable to offer long-lasting protection from infection. We believe our data published in December 2020 demonstrated preclinical proof of concept for VAX-A1. We nominated the final vaccine candidate and initiated IND-enabling activities for VAX-A1 in 2021. We continue to advance the development of VAX-A1 and we intend to provide further information about the anticipated timing of an IND application as the program progresses.

    - *Advance VAX-PG through IND-enabling activities, clinical development and regulatory approval.* VAX-PG is our novel protein vaccine candidate which targets the keystone pathogen responsible for periodontitis, a chronic oral inflammatory disease affecting an estimated 65 million adults in the United States. Our initial goal is to develop a therapeutic

vaccine to slow or stop disease progression; however, the results from clinical trials may inform the potential adoption of prophylactic immunization. We believe we have generally demonstrated preclinical proof of concept for a periodontitis protein vaccine, the data for which was published in February 2019. We nominated a final vaccine candidate for VAX-PG in 2022 and are conducting large-animal confirmatory studies prior to advancing the program to potential IND-enabling activities.

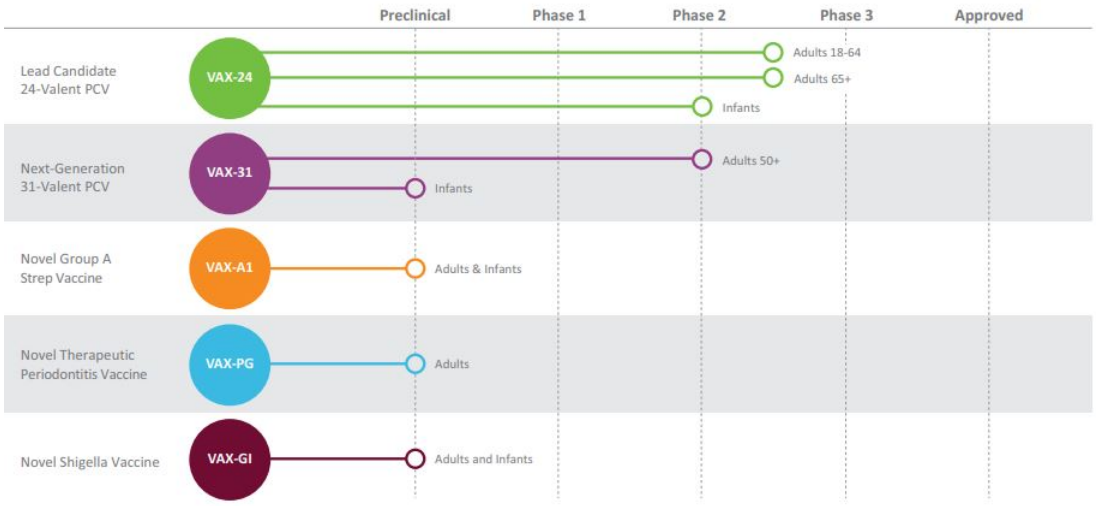
- *Advance VAX-GI program research and development.* VAX-GI is new vaccine program designed to prevent Shigella, a bacterial illness that affects an estimated 188 million people worldwide each year and results in approximately 164,000 deaths annually, mostly among children under five years of age in low- and middle-income settings. The central antigen in VAX-GI is IpaB, a well-appreciated antigen that other developers have been unable to produce in an amount sufficient to enable commercial production. With our cell-free technology, we believe we can produce this antigen at substantially improved yields, allowing for commercial-scale production. VAX-GI is being developed in collaboration with the University of Maryland, Baltimore as well as with partial funding from two research grants awarded by the NIH. We are in the process of identifying additional antigens to include with IpaB and engaged in early-stage process development activities.

- *Leverage our platform for other discovery stage programs.* We are also able to leverage our platform as a discovery engine given our ability to uniquely create building blocks to construct potential novel conjugate and protein vaccine candidates, and we have other discovery-stage programs which leverage this platform.

- *Continue to build a robust intellectual property portfolio.* We have developed and are continuing to develop a comprehensive intellectual property portfolio related to vaccine applications, including manufacturing, formulation and process applications as well as protection for our specific vaccine candidates. We have rights to a robust portfolio of patents and patent applications related to the XpressCF platform through our exclusive license from Sutro Biopharma. We currently have two issued U.S. patents, two issued Eurasian patents, one issued South Korean Patent, three issued Japanese patents, one issued Mexican patent, and multiple pending patent applications in the United States and internationally that cover our vaccine candidates including vaccine formulations, protein-antigen conjugates, methods of making conjugate vaccines with various protein-antigen conjugates and other processes related to vaccine production, enhancements of immunogenicity and methods of use.

Our Pipeline

We have utilized our cell-free protein synthesis platform to generate a pipeline of vaccine candidates that we believe, if approved, may offer important advantages over existing vaccines or for which there are no vaccines available today. The following table summarizes our current pipeline:



Global Vaccine Market (Excluding COVID-19 Vaccines)

The global vaccine market, excluding COVID-19 vaccines, was estimated at approximately $45.3 billion in 2023 and is expected to grow at a CAGR 8.9% from 2023 to approximately $69.4 billion by 2028. The World Health Organization ("WHO") has reported that non-COVID vaccine revenues have grown at nearly twice the rate of therapeutic products over the last two decades. Conjugate vaccines, including PCVs, have historically represented the largest segment – approximately a third – of the global non-COVID vaccine market. The Prevnar franchise from Pfizer Inc. ("Pfizer") comprised of Prevnar 13 ("PCV13") and PCV20, was among the highest selling non-COVID vaccine products in the world in 2023, accounting for approximately 14% of global non-COVID vaccine sales.

The pediatric vaccine market is large and well-established in the United States and European Union and growing in emerging countries. The annual new birth cohort, which in North America and Europe approached approximately 11 million in 2023, drives ongoing sales year after year due to the recommended immunization schedules. In the United States, once a new vaccine is approved by the FDA, the ACIP considers whether to recommend the use of the vaccine. New pediatric vaccines that receive a preferred recommendation from ACIP are nearly universally adopted by pediatricians and parents and are required by many schools, contributing to a national immunization rate for the diseases targeted by such vaccines of approximately 90%.

In addition, the adult vaccine market is undergoing rapid growth. Vaccination rates among adults have historically been lower and vary by disease, though strong initiatives are underway to increase awareness and utilization. Excluding the impact of the COVID-19 pandemic, studies estimate that 40,000 to 80,000 adults in the United States die annually of vaccine-preventable diseases, and hundreds of thousands more are hospitalized. In recent years, manufacturers have started developing more vaccines for the adult market, with Pfizer's PCV13 and PCV20, Merck & Co., Inc.'s ("Merck") Vaxneuvance ("PCV15") and GSK plc's ("GSK") Shingrix each representing successful examples. The U.S. adult pneumococcal market generated estimated annual sales of approximately $1 billion to $2 billion, and Shingrix, a vaccine for shingles (herpes zoster), debuted with over $1 billion in sales in 2018 as it replaced Merck's incumbent vaccine, Zostavax, after receiving an ACIP preferred recommendation, and generated over $4.3 billion in sales in 2023, in part due to increased coverage among eligible U.S. adults. The vaccines to prevent respiratory syncytial virus from Pfizer and GSK that were approved by the FDA

in May 2023 and recommended by ACIP for use in adults over the age of 60 in June 2023 have exceeded $2 billion in global sales within six months.

The complex development and production processes of vaccines create a high barrier to entry and long product lifecycles. In recent history, four multinational companies – GSK, Merck, Pfizer and Sanofi – have been responsible for developing and introducing most new vaccines to the world. As a result of the COVID-19 pandemic, there have been a number of new entrants into the vaccines market, including multinational companies and emerging biopharmaceutical companies.

Pneumococcal Disease

Pneumococcal disease is an infection caused by Pneumococcus bacteria. It can result in IPD, including meningitis and bacteremia, and non-invasive pneumococcal disease, including pneumonia, otitis media and sinusitis. The global incidence of pneumococcal disease is driven by emerging serotypes not covered by currently available vaccines. In the United States, approximately 320,000 people get pneumococcal pneumonia each year, which is estimated to result in approximately 150,000 hospitalizations and 5,000 deaths. Pneumococci also cause over 50% of all cases of bacterial meningitis in the United States. Antibiotics are used to treat pneumococcal disease, but some strains of the bacteria have developed resistance to treatments. The morbidity and mortality due to pneumococcal disease are significant, particularly for young children and older adults, underscoring the need for a more broad-spectrum vaccines.

Evolution of Pneumococcal Vaccines

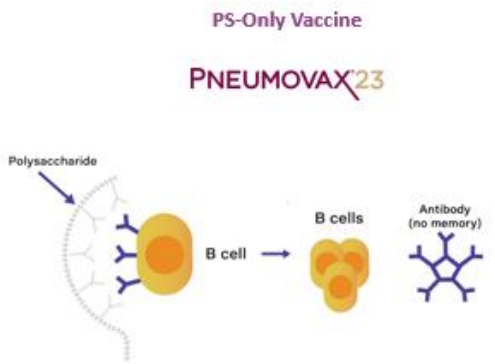
There are currently two types of vaccines targeting pneumococcal disease—polysaccharide-only vaccines and polysaccharide-conjugate vaccines. Polysaccharide vaccines contain polysaccharide antigens, which induce antibodies (B-cell responses) that bind to a bacteria's outer coating of polysaccharides and clear the bacteria. PCVs improve on polysaccharide vaccines by attaching, or conjugating, the polysaccharide antigen to a non-disease specific protein carrier. PCVs induce both an improved B-cell response and a T-cell response, resulting in a stronger and more durable immune response and longer-lasting protection, as compared to polysaccharide vaccines, which only induce a B-cell response.

Pneumococcal Polysaccharide-Only Vaccines

PPSV23, manufactured and marketed by Merck is the only pneumococcal polysaccharide vaccine widely available. PPSV23 is indicated for the prevention of pneumococcal disease in adults and was first approved in the United States in 1977, at which time it contained 14 different strains of pneumococcal bacteria. In 1983, it was replaced by the current version containing 23 different strains. PPSV23 is routinely administered to adults to provide protection against bacteremia and at its peak in 2020 generated sales of over $1.1 billion. After the ACIP recommendation of PCV20 in late 2021 eliminated the need for PPSV23 in a large part of the covered population, PPSV23 has declined from more than 50% of the U.S. adult market share to now less than 10%.

Polysaccharide vaccines induce a B-cell response only and do not induce a T-cell dependent immune response. In the absence of immunological memory responses, the resulting antibody responses are transient and cannot be boosted. Without the ability to provide long-lasting durable immunity, polysaccharide vaccines are not effective in children below two years of age. In addition, the antibody responses primarily consist of immunoglobulin M ("IgM") antibodies that, due to their size, are restricted to blood and are unable to penetrate into lung tissue to protect against pneumonia. Therefore, polysaccharide vaccines such as PPSV23 are only thought to protect against blood-borne infections, such as bacteremia. Figure 1 below illustrates polysaccharide-induced T-cell independent antibody responses.

Figure 1.



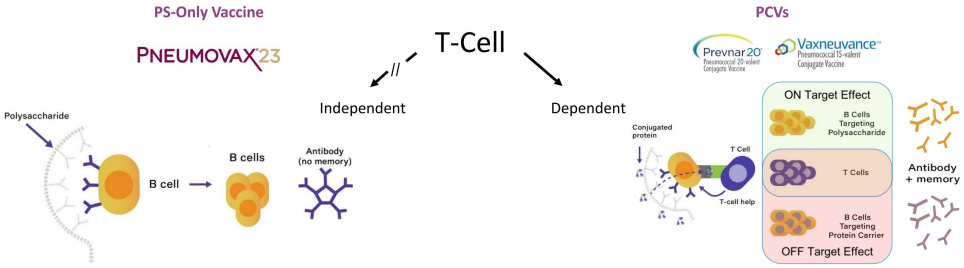
Graphics adapted from Strugnell et al, *Understanding Modern Vaccines*, Vol 1, Issue 1, 61-88.

Polysaccharide vaccines also interfere with optimal use of PCVs, as they create a hyporesponsive immune effect. In particular, absent T-cell inducement, polysaccharide vaccines actually clear the memory B-cells that are formed following primary immunization with a PCV, thereby eliminating the ability to boost with subsequent vaccination. This historically has been a significant drawback of vaccination in older adults, which consisted of the administration of a limited spectrum PCV followed by the administration of a polysaccharide vaccine. Despite these shortcomings, PPSV23 historically has been widely used primarily to provide protection against circulating strains not contained in the currently available PCV. The current routine standard-of-care in adults, which consists of the administration of either PCV20 alone or PCV15 followed by the administration of PPSV23, continues to include the alternative of a polysaccharide vaccine.

Pneumococcal Conjugate Vaccines

PCVs overcome the limitations of polysaccharide vaccines by conjugating the polysaccharide to a more immunogenic protein carrier containing T-cell epitopes. These T-cell epitopes provide $CD4^+$ help, which is critical to the conversion of a traditional B-cell dependent immune response to a more robust combined B-cell and T-cell dependent immune response. The T-cell response causes immediate class switching of the B-cells from more rudimentary IgM antibodies prevalent with polysaccharide vaccines to more refined IgG antibodies. IgG antibodies are refined enough to penetrate into lung tissues to prevent pneumonia. Furthermore, as polysaccharide strands attach to multiple copies of the protein carrier, they create an inter-strand cross-linked matrix structure, which the immune system easily recognizes as foreign. The T-cell dependent immune response also generates memory B-cells that can be re-stimulated, creating a prime-boost immune response and enabling a more robust and durable immune response, enabling the use of PCVs in young children. Figure 2 below illustrates this immune response:

Figure 2.



The first PCV, Prevnar, was a 7-valent vaccine that was launched in the United States in 2000. It included purified capsular polysaccharides of seven serotypes of *S. pneumoniae* (4, 6B, 9V, 14, 18C, 19F and 23F),

each of which was individually conjugated to a T-cell-epitope-containing, nontoxic variant of diphtheria toxin known as CRM_{197} to produce seven separate conjugates. To obtain approval, a large field efficacy study was conducted that demonstrated the vaccine's efficacy in infants. Efficacy correlated with serological immune endpoints, as measured by IgG titers (a measurement of concentration), and a seroconversion threshold (or reference antibody concentration) of protection was defined. Prevnar is credited with tremendous medical and commercial success, having dramatically reduced circulating disease in children. However, after a number of years of widespread use, IPD incidence caused by strains not contained in the vaccine started to opportunistically rise, a phenomenon called serotype replacement, which led to the need for a broader-spectrum version of the vaccine.

In the race to develop a broader-spectrum PCV than Prevnar, two vaccines were successfully developed: Synflorix, a 10-valent PCV from GSK, and PCV13, a 13-valent PCV from Wyeth (subsequently acquired by Pfizer). Based on its broader coverage of then-emerging strains, PCV13 was adopted as the standard-of-care in the United States and Europe. Synflorix continues to be used primarily in emerging countries.

PCV13 contains the seven serotypes originally included in Prevnar plus six more serotypes of *S. pneumoniae* (1, 3, 5, 6A, 7F and 19A) and was approved and launched in the United States in 2010. Each polysaccharide is conjugated to CRM_{197} to produce 13 individual conjugates, which are mixed into a final vaccine formulation and then adsorbed to alum. In 2010, PCV13 obtained FDA approval for the prevention of IPD in infants based on non-inferior IgG antibody responses relative to Prevnar, using the surrogate immune endpoints established by the prior Prevnar field efficacy study. While PCV13 failed to achieve non-inferiority on two of the common seven strains relative to Prevnar, it was granted approval across all 13 strains. Upon receipt of the ACIP preferred recommendation, PCV13 replaced Prevnar in the infant market as the standard-of-care. This also created a "catch-up" population for those children previously vaccinated with Prevnar to provide protection against the incremental serotypes covered by PCV13.

PCV13 also received accelerated approval for the prevention of IPD and pneumonia in adults in the United States based on non-inferior OPA responses as compared to PPSV23. To fulfill a post-marketing commitment, a large-scale field efficacy study of adults in the Netherlands was completed in 2013, which showed protection against community-acquired pneumonia and concordance between OPA and protection from community-acquired pneumonia. Thus, OPA was established as a validated surrogate immune endpoint in adults to support future regulatory approvals. PCV13 subsequently received an ACIP preferred recommendation for adults 65 years and older, and the standard-of-care was amended to first vaccinate with PCV13, and then after a waiting period, PPSV23. This dual vaccine regimen provided some protection against the circulating strains over and above PCV13 but we believe created coverage gaps and patient compliance and convenience challenges.

PCV13 quickly became the highest selling product in the global vaccine market. However, at the time of ACIP's recommendation in 2014, it was determined that the recommendation would be revisited in four years to evaluate the impact of PCV13 on pneumococcal disease burden in older adults. In June 2019, the ACIP downgraded its recommendation of PCV13 for older adults, given the lack of disease caused by the incorporated strains, and instead began directing physicians and patients to decide whether to vaccinate on a case-by-case basis while still recommending universal vaccination with PPSV23 due to its broader coverage.

In an effort to develop even broader-spectrum PCVs than PCV13, two vaccines were successfully developed for the adult population: PCV20, a 20-valent PCV from Pfizer, and PCV15, a 15-valent PCV from Merck.

PCV20 contains the 13 serotypes included in PCV13 plus seven more serotypes of *S. pneumoniae* (8, 10A, 11A, 12F, 15B, 22F and 33F) and was granted regulatory approval and launched in the United States in 2021 for the prevention of IPD and pneumonia (serotypes 1, 3, 4, 5, 6A, 6B, 7F, 9V, 14, 18C, 19A, 19F and 23F) in adults based on non-inferior OPA responses relative to PCV13 without the need for a field efficacy study. While PCV20 failed to achieve non-inferiority on serotype 8 relative to PPSV23, it was still granted approval across all 20 strains.

PCV15 contains the 13 serotypes included in PCV13 plus two more serotypes of *S. pneumoniae* (22F and 33F) and was granted regulatory approval and launched in the United States in 2021 for the prevention of IPD in adults based on non-inferior OPA responses relative to PCV13 without the need for a field efficacy study.

In October 2021, the ACIP voted to recommend universal vaccination for the use of either PCV20 alone or PCV15 with PPSV23 for routine use in adults aged 65 years and older as well as for those between the ages of 19 and 64 years with certain underlying medical conditions or other risk factors. In October 2022, the ACIP voted to recommend a dose of PCV20 for adults aged 65 years and older at least five years after the last pneumococcal vaccine dose for those who haven't previously received PCV20.

PCV15 was granted regulatory approval and launched in the United States in June 2022 for the prevention of IPD in infants. Pfizer's PCV20 was approved for use in infants by the FDA in April 2023, and in June 2023, the ACIP voted to recommend that providers choose either PCV15 or PCV20 for infants.

In November 2023, Merck presented positive results from a Phase 3 study evaluating its investigational 21-valent PCV, V116, in pneumococcal vaccine-naïve adults. Merck reported that V116 elicited non-inferior immune responses compared to PCV20 for the common 10 serotypes and superior responses for 10 of the 11 unique serotypes and that safety and tolerability endpoints were met. In December 2023, Merck announced that based on these Phase 3 results, the FDA accepted for priority review a new BLA for V116 and set a Prescription Drug User Fee Act ("PDUFA"), or target action date, of June 17, 2024.

Drawbacks of Current PCVs

Routine immunization with PCVs has been effective in dramatically lowering the incidence of IPD in both adults and children in the United States and other industrialized nations. However, due to a phenomenon called serotype replacement, strains that are not covered by existing vaccines are increasing in prevalence. As published in 2020, over 71% of IPD incidence in 2017 for both children and adults was caused by strains beyond the 13 strains covered by PCV13. Efforts to improve upon current standard-of-care vaccines center around expanding the valency of PCVs to address the strains driving residual pneumococcal disease. However, limitations due to conventional conjugation chemistry and carrier suppression have complicated those efforts, and notwithstanding the recent approvals of PCV20 and PCV15, there remains a significant need for broader-spectrum PCVs, as evidenced by the fact that despite PCV20's coverage, the combination of PCV15 and PPSV23 remains universally recommended when adults turn 65 in the United States, as an alternative to PCV20 alone, given the broader-spectrum coverage of these two vaccines combined compared to PCV20.

While vaccination with current PCVs has been effective in dramatically lowering the incidence of IPD in both adults and children in the United States and other industrialized nations, current PCVs suffer from the following drawbacks.

Serotype Replacement

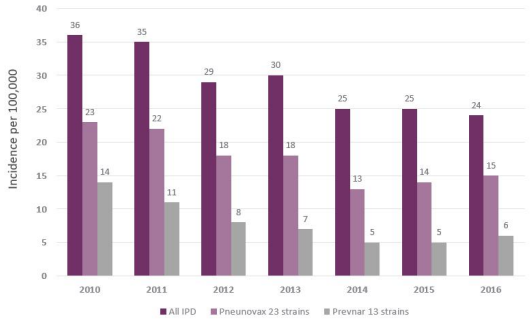
Since the introduction of PCV13, there has been a decrease in incidence of disease attributable to the serotypes included in the vaccine. However there has been a phenomenon called serotype replacement, whereby a void is created when serotypes are taken out of circulation after widespread vaccination. As a result, there has been an increase in incidence caused by the 11 incremental strains that now cause most residual pneumococcal disease. Broader-spectrum PCVs are required to maintain protection against historically pathogenic strains while expanding coverage to address current circulating and emerging strains. This serotype replacement has led to the development of a third generation of conventional PCVs, inclusive of PCV15 and PCV20. Despite these developments, the coverage of these third-generation vaccines address only half of the disease in circulation. VAX-24 and VAX-31, if approved, would increase coverage to approximately 63% and 95% of disease currently circulating in the U.S. adult population, respectively.

To date, the most comprehensive pneumococcal disease surveillance has been conducted by the CDC in the United States and by the UK Health Security Agency. As shown in Figure 3, IPD cases in adults in the United States initially declined after the introduction of PCV13 but have since plateaued. As published in 2020, non-covered serotypes were responsible for over 71% of IPD incidence in 2017 for both children and adults. The rate of serotype replacement has been more pronounced in the United Kingdom. Figure 4 shows the approximate IPD

incidence rates in the United Kingdom caused by the incremental 11 strains over and above those in PCV13, which increased over the last three years of surveillance.

Figure 3.

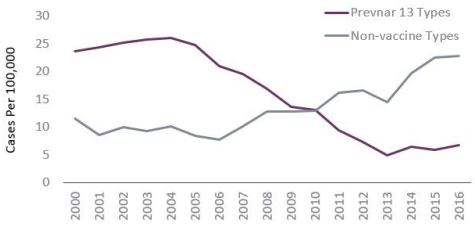
US IPD Incidence in Adults ≥ 65[1]



[1] U.S. CDC Active Bacterial Core Surveillance Annual Reports

Figure 4.

UK IPD Incidence in Adults ≥ 65[2]



[2] Ladhani et al, *Lancet Infectious Disease,* 2018 Apr.; 18(4):441-45 inclusive of unpublished raw data

While these 11 strains are covered by PPSV23, that vaccine only protects against blood-borne infections and not pneumonia, leaving patients vulnerable to infection. Although PCV20 and PCV15 address more disease-causing strains than PCV13, we believe there remains a significant need for even broader-spectrum vaccines to address a greater number of currently circulating and emerging strains.

Carrier Suppression

Technical constraints inherent to conventional conjugation chemistry limit the coverage of current PCVs due to a phenomenon known as carrier suppression. In particular, traditional conjugation methods cannot control where conjugation of the polysaccharide occurs on the protein carrier. The protein carrier used in all versions of Prevnar is CRM_{197}, a diphtheria toxin with a single point mutation rendering it non-toxic. The CRM_{197} protein contains 39 lysines, approximately 20% of which border relevant T-cell epitopes. Conventional conjugation chemistry randomly attaches the polysaccharide to any of the numerous lysines located on the protein carrier. When a polysaccharide is covalently bound to a protein carrier at a lysine residue that is co-resident with a T-cell epitope, it blocks the presentation of the T-cell epitope to the immune system, thus preventing the induction of a T-cell response. The masking of these critical epitopes prevents the conversion to a T-cell dependent immune response and negates the benefit of the protein carrier.

Meanwhile, the B-cell epitopes of both the protein carrier and the antigen are presented to the immune system, causing B-cells to the respective immunogens to compete with one another for the T-cell help engendered by unblocked T-cell epitopes. This competition for T-cell help diminishes the immune response to the polysaccharide antigen of interest, resulting in carrier suppression.

The result of carrier suppression is a decrease in the targeted immune response to the disease-specific polysaccharides, which intensifies with higher cumulative amounts of protein carrier. This phenomenon impedes the ability to expand coverage of current PCVs and has been shown consistently when broader-spectrum versions of conventional PCVs have been compared to lesser-valent versions. When PCV20 was compared to PCV13 in a well-controlled Phase 3 study in infants, the IgG antibody responses directed against the polysaccharides of interest for all thirteen of the common strains in each vaccine were lower for PCV20 (Figure 5). In 2020, Pfizer presented results of a well-controlled Phase 3 study in adults, aged 60 and over, where they compared PCV20 to PCV13. In that study, the OPA responses directed against the polysaccharides of interest for all thirteen of the common strains were lower for PCV20 (Figure 6).

Figure 5.

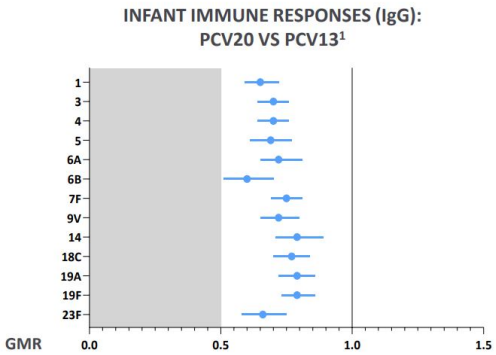
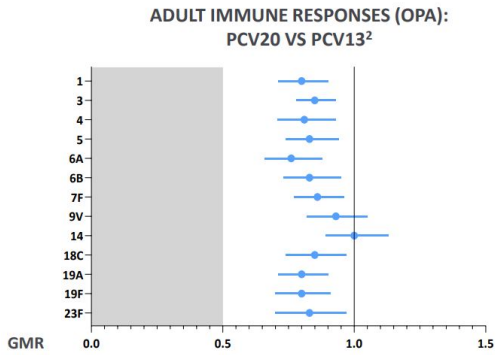


Figure 6.



[1] IgG Geometric Mean Concentrations post-dose 4 – Prevnar 20 BLA Clinical Review Memorandum by FDA (STN: 125731/189). April 27, 2023.

[2] PCV20 BLA Clinical Review Memorandum. STN: 125731/0 June 8, 2021.

GMR = Geometric Mean Ratio

Conventional Chemistry

The problem of carrier suppression is compounded by conventional conjugation chemistry used to make current PCVs, including PCV13, PCV15 and PCV20, which requires a higher amount of CRM_{197} protein carrier than polysaccharide antigen to complete the conjugation reaction, as well as long reaction times and harsh conditions that can damage the critical epitopes on the polysaccharide antigens. This results in a higher ratio of protein carrier to polysaccharide antigen in their monovalent conjugates (approximately 1.1 on average), as well as a much higher amount of cumulative protein carrier in the final formulation compared to the amount of any given polysaccharide antigen. For example, in the marketed PCV20 formulation, there are 51 micrograms of the protein carrier, CRM_{197}, relative to 2.2 micrograms of each polysaccharide (except serotype 6B at 4.4 micrograms). With substantially more protein carrier in the vaccine than polysaccharide antigen, the carrier suppression effect discussed above is exacerbated.

Our Solution

We are leveraging our cell-free protein synthesis platform to develop potentially superior conjugate vaccines for adult and pediatric indications. Our solution to the drawbacks with conventional conjugate vaccine techniques represents the first of three main applications of our platform.

Platform Application One: Creating Superior Conjugate Vaccines

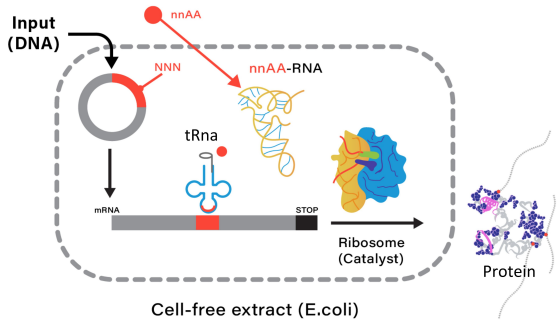
Using our cell-free protein synthesis platform, we are developing superior, novel carrier-sparing PCVs designed to have broader-spectrum coverage in an effort to address current and future residual disease in ways that conventional technologies cannot. We are able to design our investigational PCVs using site-specific conjugation in an effort to ensure optimal exposure of targeted immunogenic T-cell epitopes on protein carriers. This enables us to create broader-spectrum conjugate vaccine candidates using carrier-sparing conjugates designed to minimize carrier suppression while maintaining protective immunogenicity.

Synthesizing proteins outside of a living host cell provides us greater freedom to design and produce specific proteins of interest under optimized conditions. We separate the precise cellular machinery required for transcription, translation and energy production—the critical components for protein production—into an *Escherichia coli* (*E. coli)*-derived extract. We can then optimally express a single protein carrier by adding the plasmid-DNA encoding that protein into the extract mixture.

Site-Specific Conjugation

Within a protein carrier, we can substitute non-native amino acids ("nnAAs") for native amino acids at specific sites. These inserted nnAAs serve as conjugation anchors that permit the attachment of antigens, including polysaccharides, at a specific site on a protein carrier to ensure optimal exposure of B-cell and/or T-cell epitopes to induce the desired immune response. This precise site-specific linkage is not possible using conventional conjugation chemistry with conventional carrier proteins and affords an advantage to our conjugate vaccine candidates. Figure 8 below depicts our method of inserting nnAAs into a protein carrier, where the DNA sequence has been modified to permit nnAA incorporation into the protein at pre-selected sites using a nnAA-RNA permitting transcription and translation of the protein in the ribosome to yield the protein carrier with nnAAs site-specifically incorporated, facilitating site-specific conjugation.

Figure 7.



Most conjugate vaccines available today use a non-disease-specific protein carrier, CRM_{197}, in order to leverage T-cell epitopes to induce a T-cell dependent immune response. This traditional method produces a heterogeneous mixture of conjugates with blocked and unblocked T-cell epitopes in a large immunogenic cross-linked matrix structure. In contrast, the precision and flexibility of cell-free protein expression, together with our ability to insert nnAAs, allow us to construct our proprietary enhanced protein carrier ("eCRM") with pre-determined conjugation sites. Our method produces homogenous conjugates that provide for the consistent exposure of T-cell epitopes and likewise form a large, immunogenic cross-linked matrix structure. By precisely conjugating polysaccharides to eCRM in a way that provides for optimal exposure of T-cell epitopes to the immune system, we can heighten immunogenicity attainable with conjugate vaccines.

The figures below illustrate the site-specific conjugation process. Figure 8 shows site-specific conjugation of the polysaccharide to the protein carrier, avoiding the T-cell epitopes. Figure 9 shows the inter-strand cross-linked matrix, which is the structure of each monovalent conjugate included in the final vaccine.

Figure 8.

Precise, Site-Specific Conjugation Sites on Proprietary eCRM Protein Carrier

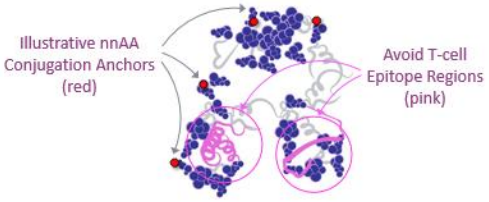
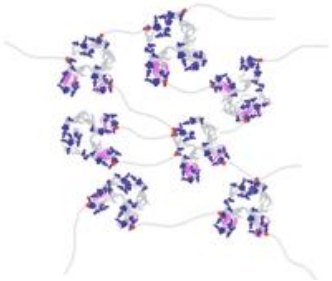


Figure 9.

Final VAX-24 Conjugates in Customary Matrix Form



We believe consistent exposure of T-cell epitopes should translate to higher potency of the protein carrier on a weight-to-weight basis. To harness this potential potency advantage, we have elected to construct conjugates with a lower ratio of protein carrier to polysaccharide than conventional PCVs. Our VAX-24 adult Phase 2 clinical studies validated our carrier-sparing approach to develop broader-spectrum PCVs As a result, we believe we can incorporate more monovalent conjugates to create an even more broad-spectrum vaccine with less protein carrier per conjugate in order to minimize carrier suppression.

Better Chemistry

We also employ a rapid and less harsh chemistry method called copper-free click chemistry to site-specifically conjugate the polysaccharides to eCRM. We believe this distinctive technique is a better controlled, more efficient and faster method of conjugation relative to conventional chemistry used to make traditional PCVs. The click chemistry conjugation reaction is designed to cause less damage to the critical immunogenic epitopes on the protein carrier or the target antigen.

Our PCV Franchise

We are developing broad-spectrum investigational PCVs designed to minimize carrier suppression.

VAX-24

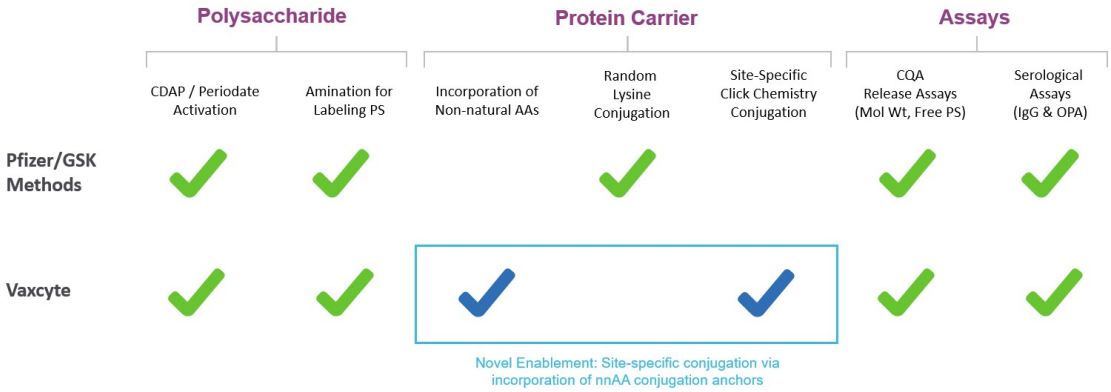
Our lead vaccine candidate, VAX-24, is designed to improve upon the standard-of-care by potentially covering an additional 14-26 percent of strains causing IPD in U.S. adults over the current standard-of-care PCVs. The 24 serotypes that comprise VAX-24 eclipse the coverage of all currently available conjugate and polysaccharide-only vaccines to prevent IPD. The 24 serotypes included in VAX-24 cover a significant portion of the IPD in circulation and are associated with high case-fatality rates, antibiotic resistance and meningitis.

In October 2022, we announced positive topline results from both the Phase 1 and Phase 2 portions of a clinical proof-of-concept study evaluating the safety, tolerability and immunogenicity of VAX-24 in healthy adults aged 18-64. The results from this Phase 1/2 clinical proof-of-concept study were published in the journal The Lancet Infectious Diseases in December 2023. In April 2023, we announced positive results from a Phase 2 study of VAX-24 in adults aged 65 and older, as well as data from the full six-month safety assessment and prespecified pooled immunogenicity analyses from both the Phase 2 study in adults aged 65 and older and the prior Phase 1/2 study in adults aged 18-64. In July 2023, we announced that the ongoing Phase 2 study of VAX-24 in healthy infants was advancing to the second and final stage of the study.

VAX-24 includes 24 purified capsular polysaccharides of *S. pneumoniae* (1, 2, 3, 4, 5, 6A, 6B, 7F, 8, 9N, 9V, 10A, 11A, 12F, 14, 15B, 17F, 18C, 19A, 19F, 20, 22F, 23F and 33F), each of which is conjugated to eCRM to produce 24 monovalent conjugates. These conjugates are mixed into a final vaccine formulation and then adsorbed to alum.

As shown in Figure 10 below, there are critical differences between VAX-24 and other currently available PCVs relating to the protein carrier, particularly the use of site-specific conjugation and the milder reaction conditions. We achieve site-specific conjugation through the insertion of multiple nnAAs, which is not possible with the conventional chemistry used for making other PCVs. The click chemistry we use for site-specific conjugation may also minimize damage to the critical immunogenic epitopes on the protein carrier and the polysaccharides through milder and shorter reactions, while other PCVs use conventional chemistries that involve harsher and longer reaction conditions.

Figure 10.



Furthermore, VAX-24 and VAX-31 improve upon the serotype spectrum of coverage relative to PCV13 and PCV20 yet contain similar aggregate amounts of protein carrier. We believe the resulting decreased carrier burden per conjugate of VAX-24 and VAX-31 are critical for minimizing carrier suppression and producing broader-spectrum pneumococcal vaccines without sacrificing immunogenicity.

Where appropriate, we capitalize on the efficiencies of well-established clinical, manufacturing and regulatory precedents by leveraging conventional methods for the development of VAX-24. For example, our polysaccharide antigens are primarily made using conventional fermentation and purification techniques and activated through conventional methods. They are also labeled through conventional amination methods prior to being conjugated to eCRM. In addition, we use the same critical quality attribute assays for molecular weight and free polysaccharide that have served as the physicochemical measures of conjugates and also serve as predictors of their immunogenicity in vivo. We also use conventional IgG and OPA serological assays to gauge the immunogenicity of our conjugates, which have served as surrogate immunological endpoints in clinical studies that enabled the approval of PCV13, PCV15 and PCV20.

We leveraged the same animal models that were utilized in the development of approved PCVs. In particular, our preclinical studies utilized a recognized rabbit model that Pfizer used in its development of Prevnar, PCV13 and PCV20, that Merck used in its development of PCV15 and that GSK used in its development of Synflorix. We believe the demonstration of conjugate-like immune responses in rabbits that results in killing of bacteria via OPA and induction of IgG antibody responses are key development milestones and are critical readouts for the development of PCVs. In our preclinical studies, the rabbit model showed consistent immunological responsiveness across all strains for which we tested our conjugates and differentiated conjugated versus unconjugated polysaccharide responses (i.e., T-cell dependent versus T-cell independent responses). The rabbit model also provided evidence regarding VAX-24's potential to generate a booster response.

We are pursuing what to date has been a well-characterized clinical development path for VAX-24 and VAX-31, consistent with other PCV developers. We have been able to conduct smaller and shorter clinical trials that target immune endpoints (e.g., OPA and IgG responses) previously recognized by regulatory authorities, and anticipate that we will be able to conduct such studies going forward. Pfizer applied this approach to the development of PCV13 and PCV20 and Merck applied it to the development of PCV15. Based on this standard, as a

prerequisite for regulatory approval, we believe that any investigational PCV will have to be compared to the standard-of-care at the time a clinical trial is initiated. Currently, the standard-of-care for routine use is either PCV20 alone or PCV15 followed by PPSV23 in adults and PCV20 or PCV15 in infants.

Preclinical Data

To obtain preclinical proof of concept, we evaluated VAX-24 compared to the then standard-of-care, PCV13, and assessed the comparative immune responses of VAX-24 using the same rabbit model utilized by other PCV developers. We dosed rabbits in our preclinical studies with 0.11mcg, as measured by the amount of polysaccharide in each conjugate, for each of the 24 conjugates in VAX-24, as well as 0.11mcg for the thirteen conjugates in PCV13 (except serotype 6B at 0.22mcg) and compared both PCVs immunogenically to each other and to PPSV23, where each of the 23 polysaccharides were dosed at 1.1mcg. The doses are representative of body weight differences in humans versus rabbits and roughly correspond to the dose differential between PCVs and polysaccharide-only vaccines. In humans, PCV13 is dosed at 2.2mcg per conjugate (except serotype 6B at 4.4mcg) or approximately one-tenth the dose of PPSV23, where each polysaccharide is dosed at 25mcg. The species of rabbits used were approximately five percent of the average weight of humans in North America, thus 0.11mcg approximates to the 2.2mcg dose for PCVs and the 1.1mcg dose approximates to the 25mcg dose for PPSV23.

We completed multiple preclinical proof-of-concept studies of VAX-24 compared to PCV13 and PPSV23 in rabbits. The endpoints of the studies were to measure, on a serotype-specific basis, IgG antibody responses, the surrogate endpoint for pediatrics, and OPA responses, the surrogate endpoint for adults. Initial proof of concept was obtained with research-grade raw materials and conjugates made at Vaxcyte prior to initiating technology transfer to Lonza and production scale-up. For subsequent preclinical studies, conjugates were made at Vaxcyte at small-scale using optimized processes and procedures using Lonza-produced raw materials, including our proprietary eCRM carrier and all 24 polysaccharides that had already been tech transferred and scaled up. In anticipation of clinical evaluation and potential commercial launch, we further scaled our manufacturing, completing a technology transfer of the optimized processes and procedures for the production of each of the 24 conjugates in VAX-24. The conjugates were then produced at Lonza at an over fifteen-fold scale increase to the prior scale at Vaxcyte. At each stage, all 24 of the conjugates in VAX-24 met the critical quality attributes and the combination vaccine was administered in the rabbit model.

In each of our preclinical studies, VAX-24 showed comparable or superior OPA responses at 1/10th the dose of PPSV23 and comparable OPA responses to an equivalent dose of PCV13 on a serotype-by-serotype basis. Additionally, VAX-24 showed superior IgG antibody responses at 1/10th the dose of PPSV23 and comparable IgG responses to an equivalent dose of PCV13 on a serotype-by-serotype basis.

VAX-24 Clinical Development Plan

To accelerate our time to market, we are pursuing clinical development first for adults and then in the pediatric population. We achieved clinical proof of concept in October 2022 when we announced positive topline results from a Phase 1/2 study evaluating the safety, tolerability and immunogenicity of VAX-24 in healthy adults aged 18-64. The results from this Phase 1/2 clinical proof-of-concept study were published in the journal The Lancet Infectious Diseases in December 2023. In April 2023, we announced positive results from a Phase 2 study of VAX-24 in adults aged 65 and older, as well as data from the full six-month safety assessment and prespecified pooled immunogenicity analyses from both the Phase 2 study in adults aged 65 and older and the prior Phase 1/2 study in adults aged 18-64.

For adults, the FDA has granted VAX-24 Fast Track and Breakthrough Therapy designations which are designed to facilitate the development and expedite the review of drugs, including vaccines, which treat or prevent serious conditions and fill an unmet medical need. In October 2023, we completed a successful End-of-Phase 2 meeting with the FDA. The meeting focused on the VAX-24 adult Phase 3 clinical program, including the design of the pivotal, non-inferiority study and other Phase 3 studies needed to support a BLA submission. Based on the End-of-Phase 2 meeting, we believe there is agreement with the FDA on the clinical design of the adult Phase 3 program, including the approximate overall number of subjects, the primary and secondary endpoints for the pivotal, non-inferiority study as well as confirmation that the planned immunogenicity analyses are sufficient to support licensure

and an efficacy study is therefore not required. Following the successful End-of-Phase 2 meeting with the FDA regarding the VAX-24 adult Phase 3 clinical program, and as part of ongoing CMC-focused discussions, we received encouraging input from the FDA regarding the VAX-24 adult licensure requirements. We were granted these discussions under the VAX-24 adult Breakthrough Therapy designation and expect to seek additional CMC-focused input from the FDA as we prepare for and conduct the VAX-24 adult Phase 3 program.

Following the topline data from the VAX-31 adult Phase 1/2 study described below, which is expected in the third quarter of 2024, we expect to determine whether to advance VAX-24 or VAX-31 to an adult Phase 3 program. If we move forward with the VAX-24 adult Phase 3 program, we expect to initiate the pivotal, non-inferiority study in adults aged 50 and older in the second half of 2024 and announce topline safety, tolerability and immunogenicity data from this study in the second half of 2025. We would expect to initiate the remaining Phase 3 studies, which are shorter in duration than the non-inferiority study, for VAX-24 in the adult population in 2025 and 2026. If we move forward with the VAX-31 adult Phase 3 program, we expect to initiate the full complement of potential Phase 3 studies in 2025 and 2026. Subject to the results of the adult Phase 3 studies, we would expect to submit a BLA shortly following the completion of the last Phase 3 study.

For the pediatric population, in February 2023, we announced the FDA cleared the VAX-24 IND application for the prevention of IPD in infants. In March 2023, we announced that the first participants were dosed in the first stage of a Phase 2 study of VAX-24 in healthy infants and, in July 2023, we announced that the ongoing study had advanced to the second and final stage. The independent Data Safety Monitoring Board ("DSMB") approved advancing to the second stage of the study following the review of the safety and tolerability results from the first stage. New participants were enrolled and dosed in Stage 2 of the study in July 2023. Additionally, in agreement with the FDA, we amended the study protocol for Stage 2, changing the study comparator to PCV20, which became the broadest-spectrum PCV recommended by ACIP in June 2023. We expect to share topline data from the primary three-dose immunization series of the study by the end of the first quarter of 2025, followed by topline data from the booster dose by the end of 2025.

Adult Indication

We are using OPA titers as the primary immunogenicity endpoint for the VAX-24 program in adults. OPA is believed to be the primary protective mechanism against pneumococcal disease. In addition, we are measuring IgG responses as a secondary endpoint, as such responses may serve as supportive evidence of immunogenicity for comparison. Based on our End-of-Phase 2 meeting with the FDA, we believe that these endpoints, if met in a Phase 3 trial, will be sufficient to obtain regulatory approval of VAX-24 and that we will not need a clinical field efficacy study.

The FDA has previously approved pneumococcal vaccines upon the establishment of non-inferiority based on a head-to-head comparison using established surrogate immune endpoints in the target population. For adults, PCV13 was approved based on the establishment of non-inferiority of OPA responses relative to PPSV23, on a strain-by-strain basis, where non-inferiority was defined as greater than or equal to 0.50 of the lower limit of the two-sided 95% confidence interval of the OPA geometric mean titer ratio. PCV20 and PCV15 were approved based on the same non-inferiority criterion but compared with PCV13 and PPSV23.

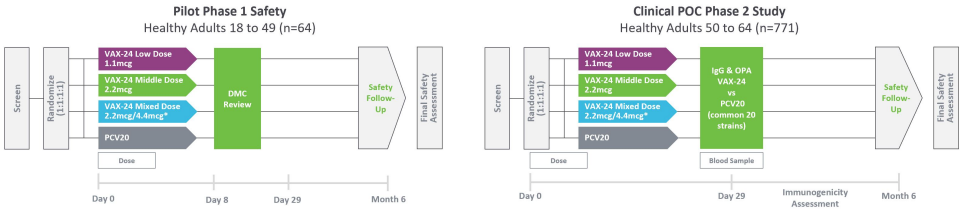
Phase 1/2 Clinical Proof-of-Concept Study in Adults Aged 18 to 64

Our first-in-human study was a randomized, double-blind, dose-finding, controlled Phase 1/2 clinical proof-of-concept study designed to evaluate the safety, tolerability and immunogenicity of VAX-24 in healthy adults aged 18 to 64. The Phase 1 portion of the study evaluated the safety and tolerability of a single injection of VAX-24 at three dose levels, 1.1mcg, 2.2mcg and 2.2mcg/4.4mcg, and compared to PCV20 in 64 healthy adults aged 18 to 49. Participants were randomized equally in four separate arms and were evaluated for safety 8 and 29 days after dosing. The Phase 2 portion evaluated the safety, tolerability and immunogenicity of a single injection of VAX-24 at the same three dose levels and compared to a single injection of PCV20 in 771 healthy adults 50 to 64 years of age. Participants were randomized equally in four separate arms and approximately 28 days after participants were dosed, samples were collected to assess immunogenicity. The immunogenicity objectives of the Phase 2 portion of the study included an assessment of the induction of antibody responses, using OPA

and IgG, at each of the three VAX-24 doses and compared to PCV20, and for the additional four serotypes contained in VAX-24 (and PPSV23), but not in PCV20, the percentage of subjects that experienced a four-fold rise in antibody titers. Participants in the study were evaluated for safety through six months after vaccination.

Figure 11 is a schematic of the overall study design of our Phase 1/2 study:

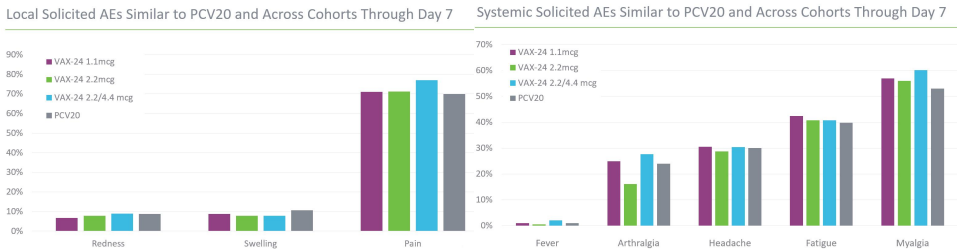
Figure 11.



On October 24, 2022, we announced positive topline results from both the Phase 1 and Phase 2 portions of the study.

VAX-24 met the primary safety and tolerability objectives, demonstrating a safety profile similar to PCV20 for all doses studied. Frequently reported local and systemic reactions were generally mild-to-moderate, resolving within several days of vaccination, with no difference observed across the cohorts. No serious adverse events or new onset chronic illnesses were considered to be related to study vaccines.

Figure 12.



In this study, VAX-24 demonstrated robust OPA and IgG immune responses for all 24 serotypes at all doses studied (1.1mcg, 2.2mcg, 2.2mcg/4.4mcg). At the conventional 2.2mcg dose, which we plan to advance to a potential Phase 3 program, VAX-24 met or exceeded the established regulatory immunogenicity standards for all 24 serotypes. At this dose, VAX-24 met the standard OPA response non-inferiority criteria for all 20 serotypes common with PCV20, of which 16 serotypes (3, 4, 6B, 7F, 8, 9V, 10A, 11A, 12F, 14, 15B, 18C, 19A, 19F, 23F and 33F) achieved higher immune responses and four serotypes (9V, 18C, 19F and 33F) reached statistical significance. Additionally, at all three doses, VAX-24 met the standard superiority criteria for all four serotypes (2, 9N, 17F and 20B) unique to VAX-24. VAX-24 has the potential to cover an additional 14-26 percent of strains causing IPD in adults over the current standard-of-care PCVs.

Figure 13.

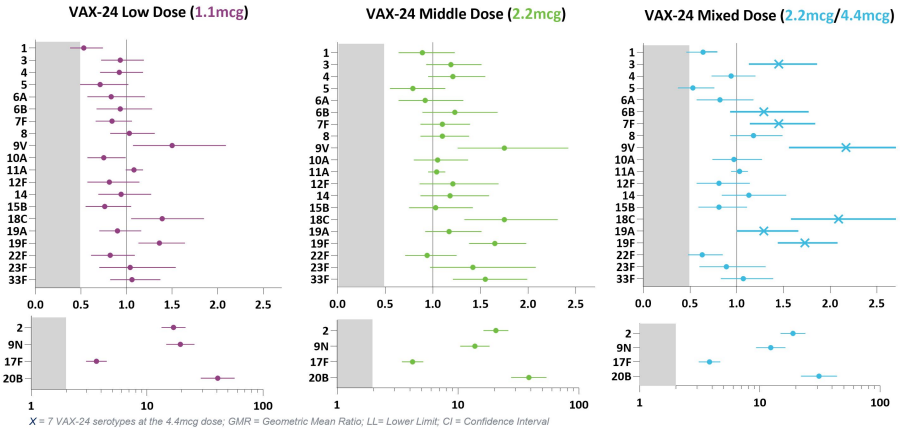
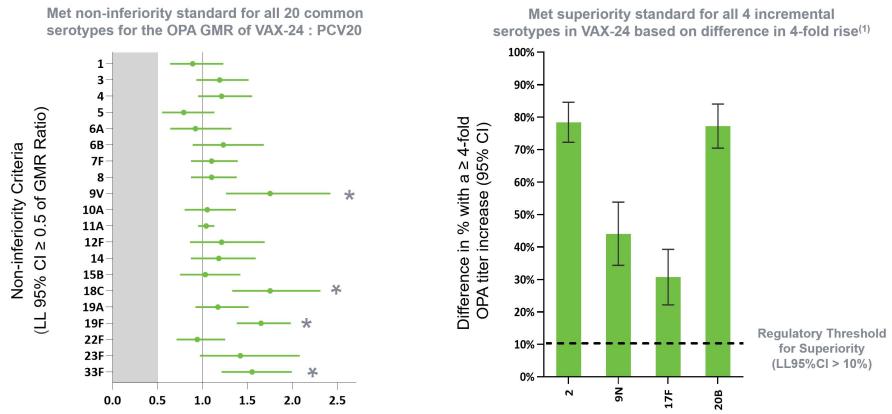


Figure 14.



Based on the results of this study, the FDA granted Breakthrough Therapy designation for VAX-24 in adults. The FDA's Breakthrough Therapy process is designed to expedite the development and review of drugs that are intended to treat a serious or life-threatening condition. The designation is based upon preliminary clinical evidence indicating that the drug or vaccine may demonstrate substantial improvement over available therapies on one or more clinically significant endpoints. With Breakthrough Therapy designation, we have access to all of the elements of the FDA's Fast Track program, as well as the ability to receive guidance and support from the FDA on an efficient drug development program and an organizational commitment from senior managers within the FDA.

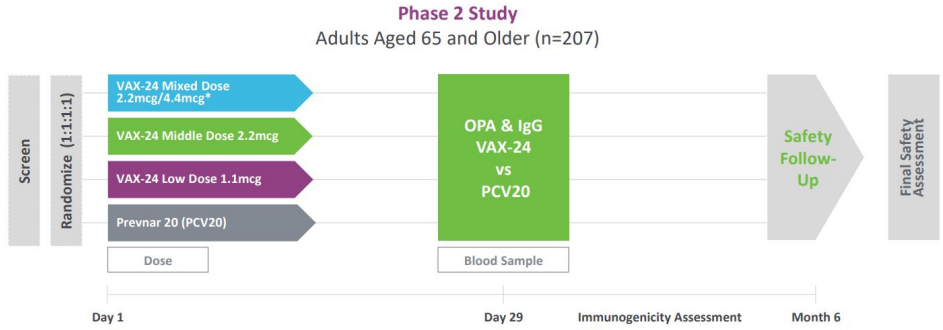
Phase 2 Clinical Study in Adults 65 and Older

To add to the body of data in adults, we conducted a separate Phase 2 study in adults aged 65 and older. This study was a randomized, double-blind, dose-finding, controlled Phase 2 study designed to evaluate the safety, tolerability and immunogenicity of a single injection of VAX-24 at the same three dose levels evaluated in the Phase 1/2 study, 1.1mcg, 2.2mcg and 2.2mcg/4.4mcg, and

compared to a single injection of PCV20 in 207 healthy adults aged 65 and older. Participants were randomized equally in four separate arms and approximately 28 days after participants were dosed, samples were collected to assess immunogenicity. The immunogenicity objectives of the study include an assessment of the induction of antibody responses, using OPA and IgG, at each of the three VAX-24 doses and compared to PCV20, and for the additional four serotypes contained in VAX-24 (and PPSV23), but not in PCV20, the percentage of subjects that experience a four-fold rise in antibody titers. This study was designed to inform the powering of a Phase 3 study and was not powered to demonstrate non-inferiority. Participants in the study also were evaluated for safety through six months after vaccination.

Figure 15 is a schematic of the overall study design of our Phase 2 study in adults aged 65 and older:

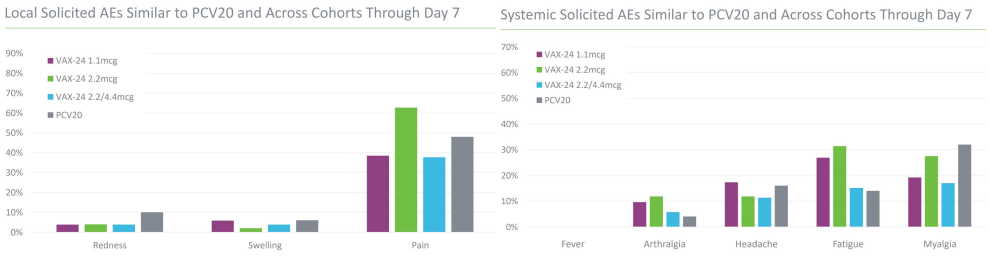
Figure 15.



On April 17, 2023, we announced positive results from this Phase 2 study of VAX-24 in adults aged 65 and older, as well as data from the full six-month safety assessment and prespecified pooled immunogenicity analyses from both the Phase 2 study in adults aged 65 and older and the prior Phase 1/2 study in adults aged 18-64.

In this Phase 2 study, VAX-24 demonstrated robust OPA immune responses across all 24 serotypes at all doses studied (1.1mcg, 2.2mcg, and 2.2mcg/4.4mcg), confirming the prior Phase 2 adult study results. The VAX-24 2.2mcg dose, which we plan to advance to a potential Phase 3 program, showed an overall improvement in immune responses compared to PCV20 relative to the results from the prior Phase 2 study in adults aged 50-64. The six-month safety data from both adult studies showed safety and tolerability results for VAX-24 similar to PCV20 at all doses studied.

Figure 16.



Consistent with prior Phase 2 study, the 2.2mcg dose demonstrated higher OPA GMR for 16 out of the 20 shared serotypes. The 2.2mcg dose showed robust immune responses for all 24 serotypes.

Figure 17.

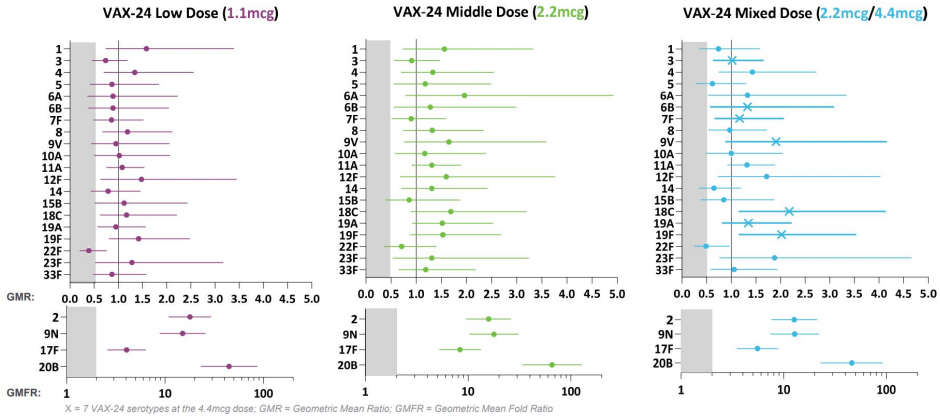
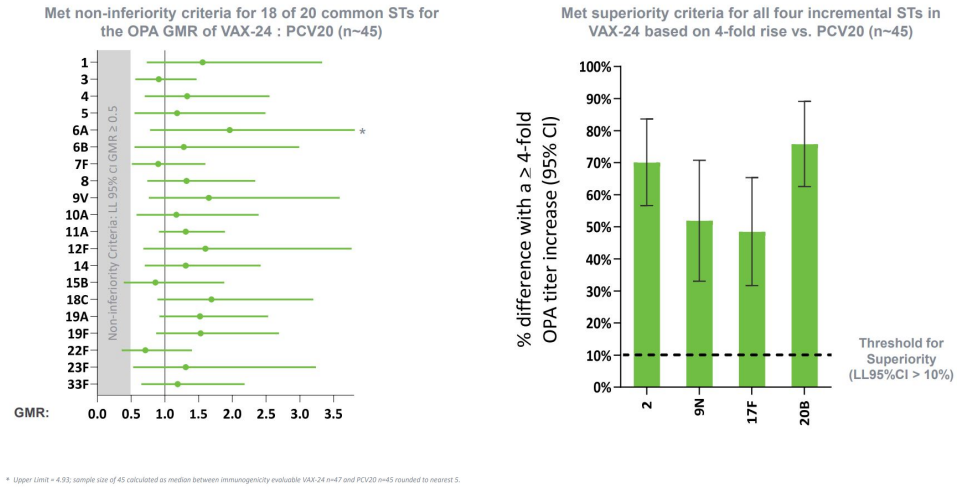


Figure 18.

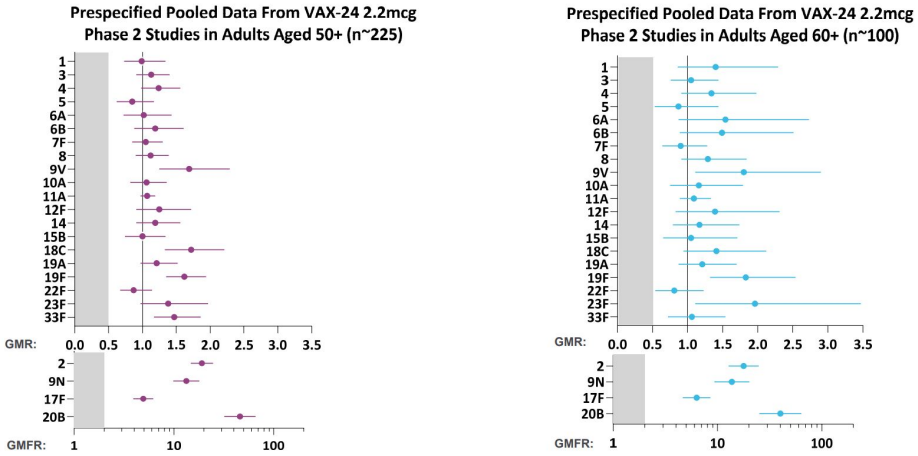


Prespecified Pooled Immunogenicity Analyses of Data from VAX-24 Adult Phase 2 Studies

Additionally, we conducted prespecified pooled analyses of data from both adult Phase 2 studies to evaluate the immunogenicity of VAX-24 in participants aged 50 and older and aged 60 and older, which are representative populations for the potential VAX-24 Phase 3 pivotal study. The prespecified pooled immunogenicity analyses of data from both adult Phase 2 studies showed the VAX-24 2.2mcg dose met the OPA non-inferiority criteria for all 20 serotypes common with PCV20 and met the superiority criteria for the four additional serotypes unique to VAX-24. In the pooled group with participants aged 50 and older, VAX-24 met the OPA response non-inferiority criteria for all 20 serotypes common with PCV20, of which 16 achieved higher immune responses and four reached statistical significance. In the pooled group with participants aged 60 and older, VAX-24 met the OPA

response non-inferiority criteria for all 20 serotypes common with PCV20, of which 17 achieved higher immune responses and three reached statistical significance.

Figure 19.



Combined Six-Month Safety Data from Both Adult VAX-24 Studies

In April 2023, we also reported the full six-month safety results from the VAX-24 Phase 2 study in adults aged 65 and older and the VAX-24 Phase 1/2 study in adults aged 18-64. Through six months, VAX-24 demonstrated safety and tolerability results similar to PCV20 across all ages and doses studied. Frequently reported local and systemic reactions were generally mild-to-moderate, resolving within several days of vaccination, with no meaningful difference observed across the cohorts. Further, no serious adverse events or new onset chronic illnesses were considered to be related to study vaccines. In a VAX-24 arm of the Phase 2 study in adults aged 65 and older, one participant with multiple pre-existing risk factors suffered a sudden cardiac death six months post-vaccination, which the Principal Investigator determined was not related to study vaccine due to the participant's history of hypertensive cardiovascular disease.

Figure 20.

	VAX-24 – Low Dose (1.1mcg)	VAX-24 – Middle Dose (2.2mcg)	VAX-24 – Mixed Dose (2.2mcg/4.4mcg)	PCV20
Number of Subjects with	261	258	260	262
Unsolicited TEAE, n (%)	38 (14.6)	28 (10.9)	30 (11.5)	42 (16.0)
Related Unsolicited TEAE, n (%)	5 (1.9)	13 (5.0)	7 (2.7)	13 (5.0)
MAAE, n (%)	32 (12.2)	29 (11.2)	27 (10.4)	37 (14.1)
Related MAAE, n (%)	0	0	1 (0.4)	0
NOCI, n (%)	4 (1.5)	4 (1.6)	7 (2.7)	5 (1.9)
Related NOCI, n (%)	0	0	0	0
SAE, n (%)	3 (1.1)	4 (1.6)	2 (0.77)	4 (1.5)
Related SAE, n (%)	0	0	0	0
Death, n (%)	0	1 (0.39)[1]	0	0
Related Death, n (%)	0	0	0	0

(1) 66-year-old white, obese male (BMI:47.4) with hypertension. No solicited AEs were reported after vaccination. Participant suffered sudden cardiac death six months post-vaccination determined by Principal Investigator to be not related to study product due to participant's history of hypertensive cardiovascular disease.

TEAE = Treatment emergent adverse events

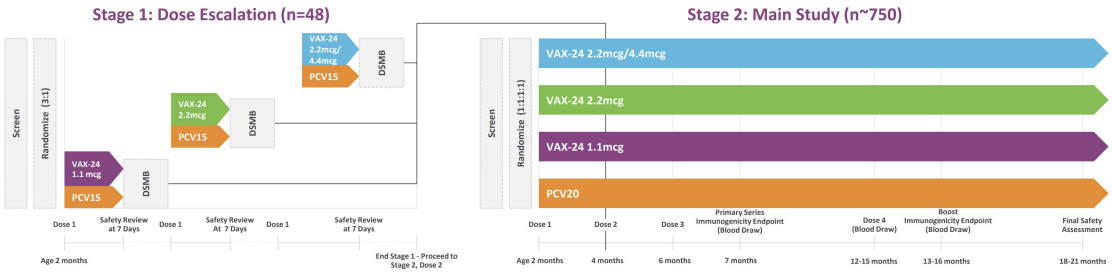
Excludes Solicited AEs

Pediatric Indication

We are also developing VAX-24 as a pediatric vaccine. In August 2022, we announced successful completion of a pre-IND meeting with the FDA regarding our pediatric clinical program for VAX-24. We received positive written feedback from the FDA supporting the initiation of a pediatric study that proceeds directly into infants contingent on satisfactory topline safety, tolerability and immunogenicity results from the VAX-24 Phase 1/2 clinical proof-of-concept study in adults 18 to 64 years of age, which we have since demonstrated. This approach provides us with an accelerated clinical path to deliver a potentially best-in-class PCV, VAX-24, to the pediatric population, which represents the largest portion of the pneumococcal vaccine market in the United States. In February 2023, we announced the FDA cleared the VAX-24 IND application for the prevention of IPD in infants. In March 2023, we announced that the first participants were dosed in the first stage of a Phase 2 study of VAX-24 in healthy infants and, in July 2023, we announced that the ongoing study had advanced to the second and final stage. The independent DSMB approved advancing to the second stage of the study following the review of the safety and tolerability results from the first stage. New participants were enrolled and dosed in Stage 2 of the study in July 2023. Additionally, in agreement with the FDA, we amended the study protocol for Stage 2, changing the study comparator to PCV20, which became the broadest-spectrum PCV recommended by the ACIP in June 2023.

The Phase 2, randomized, observer-blind, dose-finding two-stage clinical study is evaluating the safety, tolerability and immunogenicity of VAX-24 at three dose levels, 1.1mcg, 2.2mcg, and 2.2mcg/ 4.4mcg, and compared to PCV15 and PCV20 in healthy infants. The Stage 1 portion of the study evaluated the safety and tolerability of a single injection of VAX-24 at three dose levels compared to PCV15 in approximately 48 infants in a dose-escalation approach. The Stage 2 portion is evaluating the safety, tolerability and immunogenicity of VAX-24 at three dose levels and compared to PCV20 in approximately 750 infants. In line with recommendations from the ACIP, the study design includes a primary immunization series consisting of three doses given at two months, four months and six months of age, followed by a subsequent booster dose at 12-15 months of age. The key prespecified immunogenicity study endpoints include an assessment of immune responses for all three VAX-24 doses and compared to PCV20 on the shared serotypes measured at 30 days post-dose three ("PD3") and post-dose four ("PD4"). Immune responses will be assessed based on anti-pneumococcal polysaccharide serotype-specific IgG responses (proportion of participants achieving the accepted IgG threshold value of ≥0.35mcg/ml) at 30 days PD3 and IgG geometric mean titer ratios at 30 days PD4. All participants in the study will be evaluated for safety through six months following the booster dose. We expect to share topline data from the primary three-dose immunization series of the study by the end of the first quarter of 2025, followed by topline data from the booster dose by the end of 2025.

Figure 21.



We expect the data will inform on the dose levels for each of the conjugates in the final VAX-24 infant formulation. Consistent with the approval processes for PCV13, PCV15 and PCV20 in infants, we do not anticipate that a clinical field efficacy trial will be required for VAX-24 in the pediatric population. We expect the clinical development of VAX-24 to follow the same approach utilized for PCV13, PCV15 and PCV20, where vaccine effectiveness against IPD was inferred from immunologic correlates. In contrast to the adult population, VAX-24 approval in the pediatric population is expected to be based on a non-inferiority comparisons of IgG responses to PCV20, the current standard-of-care in infants.

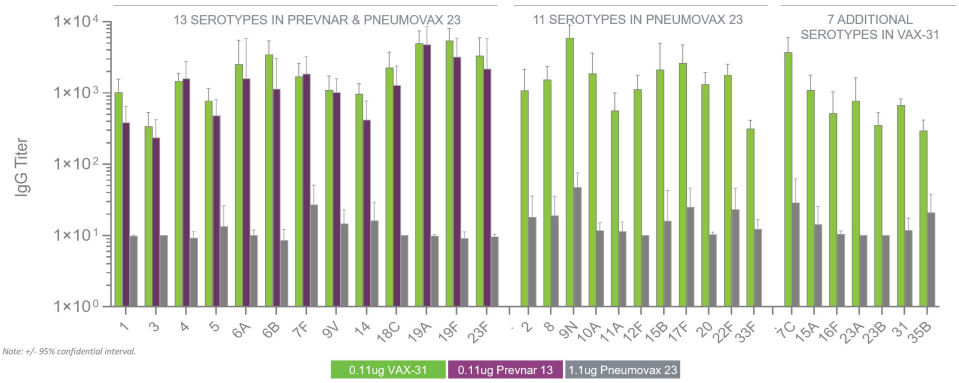
If our Phase 2 trials are completed successfully, we expect to conduct pivotal Phase 3 trials in the pediatric population that focus on evaluating non-inferiority to PCV20 for immunogenicity and seroconversion or antibody concentration threshold; assessing U.S. routine vaccination responses following concomitant administration with VAX-24; and generating a sufficient safety database in infants. The Phase 3 non-inferiority results would then be used to seek approval of VAX-24 in the pediatric population. This approach is similar to the approach utilized to develop PCV13, where the immunogenicity of PCV13 was compared to the original 7-valent Prevnar product, which was the standard-of-care at the time, as well as PCV15 and PCV20 which were compared to PCV13.

VAX-31

VAX-31 is a franchise extension of VAX-24 that, if approved, would expand strain coverage from 24 to 31 strains and demonstrate the scalable and modular nature of conjugate vaccines we can develop. VAX-31 includes all of the strains contained in VAX-24 plus incremental strains that were selected based on the epidemiological evidence demonstrating their role in circulating IPD and is designed to protect against these emerging strains and to help address antibiotic resistance. The serotypes in VAX-31 cover approximately 95% of the circulating IPD in the U.S. adult population and 98% in the UK adult population.

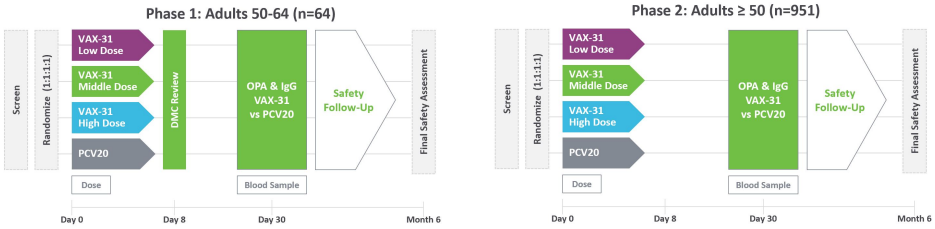
We have completed multiple preclinical proof-of-concept studies for VAX-31 in rabbit models compared to PCV13, as well as 31 polysaccharides absorbed onto alum. IgG responses in rabbits were superior to polysaccharide/alum and comparable to the common 13 strains in PCV13. We completed the process of transferring and scaling the conjugation processes at Lonza for each of the incremental conjugates contained in VAX-31 over and above those contained in VAX-24. The data shown below in Figure 22 was generated using those conjugates produced at larger scale at Lonza and confirm that the eCRM and polysaccharide raw materials and the conjugation processes for each of the conjugates in VAX-31 demonstrate immunogenicity comparable to PCV13 and superior to polysaccharide/alum alone, consistent with prior lots of VAX-31.

Figure 22.



In October 2023, we announced the FDA clearance of the IND application for VAX-31 for the prevention of IPD in adults. In November 2023, we announced that the first participants were dosed in a Phase 1/2 clinical study for VAX-31 in adults. The VAX-31 Phase 1/2 clinical study is a randomized, observer-blind, active-controlled, dose-finding clinical study designed to evaluate the safety, tolerability and immunogenicity of VAX-31 at three dose levels (low, middle and high) and compared to PCV20 in 1,015 healthy adults aged 50 and older. The Phase 1 portion of the study evaluated the safety and tolerability of a single injection of VAX-31 at three dose levels and compared to PCV20 in 64 healthy adults 50 to 64 years of age. An independent Data Monitoring Committee conducted an assessment of the Phase 1 safety and tolerability results and recommended that the study proceed as planned to Phase 2. Phase 1 participants will also be evaluated for immunogenicity, and the Phase 1 safety, tolerability and immunogenicity data will be pooled with the participants in the Phase 2 portion of the study. The Phase 2 portion of the study will evaluate the safety, tolerability and immunogenicity of a single injection of VAX-31 at the same three dose levels and compared to PCV20 in 951 healthy adults 50 years of age and older. Participants were randomized equally in four separate arms and, 30 days after dosing, serology samples will be collected to assess immunogenicity. The immunogenicity objectives of the study include an assessment of the induction of antibody responses, using OPA and IgG, at each of the three VAX-31 doses and compared to PCV20 for the 20 serotypes in common, as well as for the additional 11 serotypes contained in VAX-31, but not in PCV20. Participants in the study are being evaluated for safety through six months after vaccination. The study is being conducted at approximately 25 sites in the United States. In January 2024, we announced the completion of enrollment in the Phase 1/2 clinical study evaluating VAX-31 in healthy adults aged 50 and older. We expect to announce topline safety, tolerability and immunogenicity data from the Phase 1/2 study in the third quarter of 2024.

Figure 23.



PCV Adult Program Next Steps

At the end of October 2023, we completed a successful End-of-Phase 2 meeting with the FDA. The meeting focused on the VAX-24 adult Phase 3 clinical program, including the design of the pivotal, non-inferiority study and other Phase 3 studies needed to support a BLA submission. Based on the End-of-Phase 2 meeting, we

believe there is agreement with the FDA on the clinical design of the adult Phase 3 program, including the approximate overall number of subjects, the primary and secondary endpoints for the pivotal, non-inferiority study as well as confirmation that the planned immunogenicity analyses are sufficient to support licensure and a separate efficacy study is therefore not required. In January 2024, we announced that we received encouraging input from ongoing discussions with the FDA about the VAX-24 adult program to further inform our CMC licensure requirements and that we expect to seek additional CMC-focused input from the FDA as we prepare for and potentially conduct our VAX-24 adult Phase 3 program. Following the topline data from the VAX-31 adult Phase 1/2 study, which is expected in the third quarter of 2024, we expect to determine whether to advance VAX-24 or VAX-31 to an adult Phase 3 program. If we move forward with the VAX-24 adult Phase 3 program, we expect to initiate the pivotal, non-inferiority study in adults aged 50 and older in the second half of 2024 and announce topline safety, tolerability and immunogenicity data from this study in the second half of 2025. We would expect to initiate the remaining Phase 3 studies, which are shorter in duration than the non-inferiority study, for VAX-24 in the adult population in 2025 and 2026. If we move forward with the VAX-31 adult Phase 3 program, we expect to initiate the full complement of potential Phase 3 studies in 2025 and 2026. Subject to the results of the adult Phase 3 studies, we would expect to submit a BLA for VAX-24 or VAX-31 shortly following the completion of the last Phase 3 study.

Platform Application Two: Novel Conjugate Vaccine Opportunities

We are also developing novel conjugate vaccine candidates for other diseases for which there are no existing vaccines. By leveraging our platform, we have been able to generate novel protein carriers with site-specific incorporation of nnAAs designed to provide optimal exposure of both B-cell and T-cell epitopes on the carrier. Using these novel protein carriers, we can produce highly stable conjugate vaccine candidates through site-specific conjugation of antigens, including polysaccharides. Functionally, one significant advantage of using carriers may be the additional protective immunity that the protein itself can provide beyond the conjugated antigen itself.

Group A Strep Disease Background and Market Opportunity

Streptococcus pyogenes (S. pyogenes or Group A Strep) bacteria cause a wide spectrum of both acute and chronic clinical conditions that lead to considerable disease burden globally. Group A Strep causes an estimated 800 million cases of illness each year and is one of the leading infectious disease-related causes of death and disability worldwide. It is estimated that over 600,000 deaths globally result from Group A Strep, which is in line with the impact seen from the Measles, Rotavirus and Pertussis. The total annual market for a Group A Strep vaccine is estimated at approximately $3 billion to $4 billion globally. The annual economic burden of Group A Strep disease in the U.S. population is estimated to exceed $6 billion resulting from invasive disease and non-severe acute upper respiratory infections. In addition, Group A Strep drives significant antibiotic use, especially among children, and as such contributes towards increased antimicrobial resistance. Among older adults (≥ 65 years) in the United States, rates of invasive disease and deaths caused by Group A Strep have more than doubled over the last decade. Some of the most serious consequences of Group A Strep include invasive diseases such as flesh-eating disease (necrotizing fasciitis), sepsis and sequelae such as rheumatic heart disease (RHD). Approximately 40 million people are currently affected by RHD worldwide. Importantly, the majority of Group A Strep infections lead to pharyngitis, commonly known as strep throat, which is highly prevalent in school-age children. In the United States, an estimated 17% of outpatient antibiotic prescriptions dispensed to children aged 3 to 9 years are for the treatment of suspected Group A Strep infections. Studies have indicated that antibiotic resistance to Group A Strep has significantly increased over the past decade, leading the CDC to categorize Group A Strep as a concerning threat. Additionally, the development of vaccines against Group A Strep has become a priority for the WHO amid recognition of the rising disease incidence globally, as well as the need to combat avoidable antibiotic consumption.

It has been established that the repeated natural infection of children with Group A Strep results in immune responses that are protective against subsequent Group A Strep infection. We believe this observation justifies the development of a rationally designed vaccine for Group A Strep that is focused on conserved antigens expressed by all strains of the bacteria.

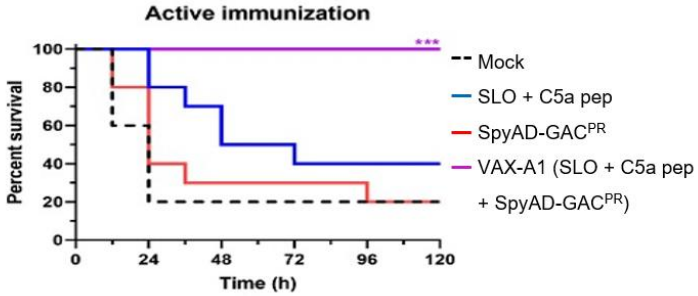
VAX-A1

We have developed a conjugate vaccine candidate, VAX-A1, designed to confer broad protection against subtypes of Group A Strep by virtue of polyrhamnose, a conserved polysaccharide, conjugated to Group A

Strep specific immunogenic protein carrier using our site-specific conjugation technology. The resulting conjugate is designed to ensure optimal exposure of both the B-cell and T-cell epitopes on the protein carrier to confer robust, boostable and durable protective immune responses. We believe this single conjugate could potentially cover all Group A Strep strains. The vaccine is a combination of this novel protein-polysaccharide conjugate along with two additional conserved surface proteins.

Our initial preclinical proof-of-concept study was published in the journal *Infectious Microbes & Diseases* in December 2020. In the study, a novel protein and polysaccharide conjugate of the Group A Strep polysaccharide was constructed for inclusion in a universal subunit vaccine against infections by the pathogen. The VAX-A1 vaccine candidate, based on SpyAD-conjugated to a modified polyrhamnose backbone (lacking N-acetyl glucosamine) and including SLO and C5a peptidase, demonstrated protection from subcutaneous and systemic challenge in mice, antibody binding and opsonophagocytic killing for multiple Group A Strep M Protein Gene types and no evidence of cross-reactivity to human heart and brain tissue antigens (Figure 24), which is a key leading indicator of vaccine safety. The study was carried out in collaboration with researchers at the Division of Host-Microbe Systems and Therapeutics, Department of Pediatrics, University of California School of Medicine and the Skaggs School of Pharmacy and Pharmaceutical Sciences at the University of California, San Diego.

Figure 24.



Our VAX-A1 vaccine development program currently is funded in part by a grant obtained from Combating Antibiotic Resistant Bacteria Biopharmaceutical Accelerator ("CARB-X"), a global non-profit partnership dedicated to accelerating antibacterial innovation to tackle the rising global threat of drug-resistant bacteria. The CARB-X grant provides for total potential funding of up to $14.6 million (including $11.7 million awarded to date since the grant's inception in 2019) upon the achievement of VAX-A1 development milestones through June 2024.

We nominated the final vaccine candidate for our VAX-A1 program and initiated IND-enabling activities in 2021. We continue to advance the development of VAX-A1 and we intend to provide further information about the anticipated timing of an IND application as the program progresses. Upon completion of the preclinical development program and IND-enabling activities for VAX-A1, we intend to conduct a multi-center, randomized, placebo-controlled Phase 1/2 study in adults. The primary objectives of the initial clinical trial will be to evaluate safety and tolerability. Secondary exploratory endpoints will be to measure IgG immune response to the vaccine antigens and to evaluate the ability of the antibodies produced in response to vaccination to inhibit and prevent infections caused by Group A Strep.

Platform Application Three: Protein Vaccine Opportunities

We believe we can also develop novel protein vaccine candidates constructed using "tough-to-make" protein antigens uniquely able to be expressed using the platform. In particular, the lack of a cellular membrane in our platform allows for the exogenous addition of components to manipulate transcription, translation and folding by modification of reaction conditions. Furthermore, removal of the typical restriction to maintain cell viability also creates unique avenues for optimizing and promoting protein production for antigens that might be cytotoxic to a cell-based system or require non-physiological conditions for optimal protein folding. Thus, utilizing these

advantages, we believe we can express and purify important protein targets to generate unique candidates that are beyond the scope of traditional production systems. Our therapeutic periodontitis vaccine candidate is the first example of a “tough-to-make” protein-based vaccine.

Periodontitis Disease Background and Market Opportunity

Periodontal disease is a highly complex, chronic oral inflammatory disease that leads to the destruction of the soft and hard tissues supporting the teeth. The subgingival niche (below the gum margin of teeth) is populated by a diverse polymicrobial plaque. It is increasingly understood that the shift from periodontal health to disease is associated with changes in the microbial composition of the subgingival plaque, including activities of bacteria such as Porphyromonas gingivalis (P. gingivalis). The development of precise approaches to control this keystone pathogen, such as a vaccine, could then positively impact the periodontal disease burden.

Those with periodontitis also have an increased risk for heart attack, stroke and other serious cardiovascular events. In addition to gum and tooth disease, periodontal inflammation and infection with P. gingivalis have been linked to atherosclerotic heart disease mediated by P. gingivalis residing in atherosclerotic plaque. While we are focused on the treatment of periodontal disease with this vaccine candidate, if P. gingivalis is found to be causative in other chronic disorders, our vaccine candidate could potentially be a highly effective treatment and allow disease intervention at a much earlier stage of the disease. For example, recent research has suggested the potential for a link between P. gingivalis and Alzheimer’s disease.

Neither the natural host immune response nor currently available treatments are curative for periodontal disease. Existing treatment includes highly aggressive and invasive procedures, including scaling and root planing and surgical intervention, coupled with antibiotic use. Despite these types of aggressive treatments, diseased sites frequently progress, leading to tooth loss. Thus, the development of an effective vaccine for periodontitis would be highly desirable.

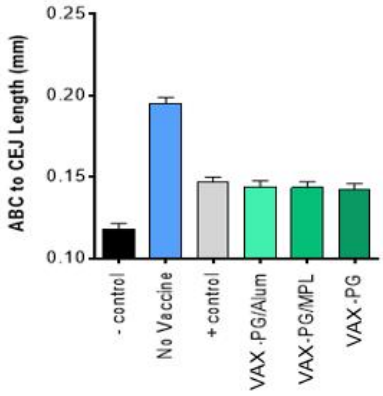
Periodontitis is a highly prevalent disease impacting > 40% of U.S. adults above the age of 30, and with similar rates globally. Periodontal disease caused an estimated loss of approximately $330 billion in the United States and Europe in 2018, with the direct costs alone exceeding $6 billion. The indirect costs are multiples of the direct costs as a result of high rates of edentulism (loss of teeth) and increased risk of many other diseases mentioned above.

VAX-PG

We are developing a novel protein vaccine candidate, VAX-PG, targeting *P. gingivalis* that incorporates protein antigens that we believe are uniquely enabled with our technology. Our initial goal is to develop a therapeutic vaccine to slow or stop disease progression; however, the results from clinical trials may inform the potential adoption of prophylactic immunization.

VAX-PG, which includes cell-free produced P. gingivalis virulence factors, including gingipains, were tested in a preclinical model that mimics periodontal disease. The results, which we believe generally demonstrate preclinical proof of concept for a periodontitis protein vaccine, were published in the *Journal of Clinical Periodontology* in February 2019. The vaccine elicited protein-specific IgG response following immunization and protected mice from P. gingivalis-elicited oral bone loss. Shown in Figure 25 is the objective bone loss of VAX-PG with alum, Monophospholipid A, or no adjuvant. Immunization with all formulations of VAX-PG provided significant protection against oral bone loss compared to the no vaccine oral challenged control group ($p<0.01$, ANOVA with Dunns multiple comparisons).

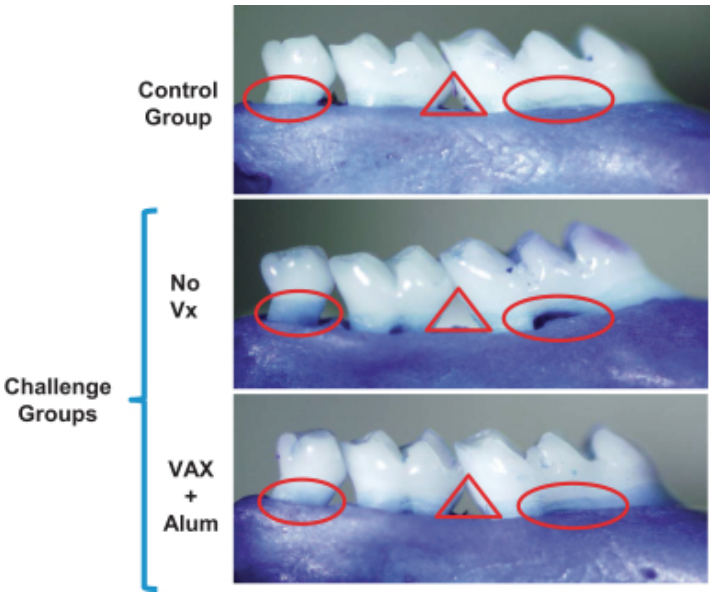
Figure 25.



ABC = alveolar bone crest
CEJ = cement-enamel junction

Shown below in Figure 26 are pictures of representative mouse jaws from the experiment. As can be seen, the vaccinated mice had considerably less bone loss than the unvaccinated and challenged control animals.

Figure 26.



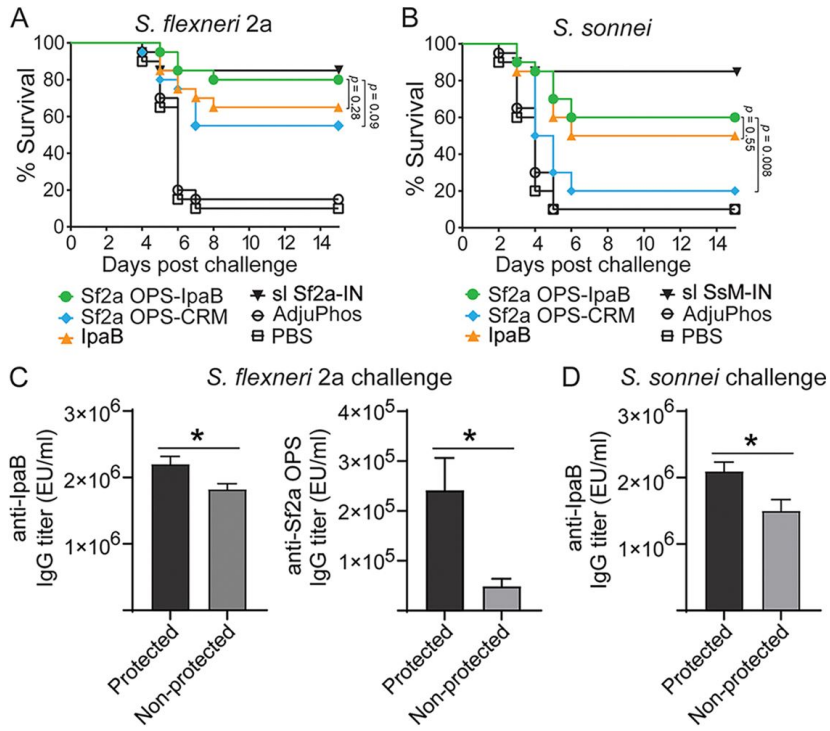
We nominated a final vaccine candidate for our VAX-PG program in 2022 and are conducting large-animal confirmatory studies prior to advancing the program to potential IND-enabling activities. Upon completion of the preclinical development program and IND-enabling activities for VAX-PG, if successful, we intend to conduct a multi-center, randomized, placebo-controlled Phase 1/2 study in adults with mild to moderate chronic periodontal disease. The primary objectives of the initial clinical trial will be to evaluate safety and tolerability. Secondary exploratory endpoints will be to measure IgG immune response to the vaccine antigens and to evaluate the ability of the antibodies produced in response to vaccination to inhibit the formation of the poly-microbial biofilm, which is characteristic of periodontal disease.

VAX-GI

VAX-GI is a novel preclinical vaccine candidate being developed as a preventative treatment for dysentery and shigellosis, which is caused by Shigella bacteria. Shigella is a bacterial illness that causes dysentery with symptoms including bloody diarrhea, fever, and stomach cramps. Currently there are no prophylactics and treatment is primarily oral rehydration therapy, with antibiotics (mainly ciprofloxacin and azithromycin) used to shorten the duration of infection. However, the growing incidence of antibiotic resistance has complicated this approach with an increasing rate of extensively drug resistant. Shigella affects an estimated 188 million people worldwide each year and results in approximately 164,000 deaths annually, mostly among children under five years of age in low- and middle-income settings. Further, in young children Shigella can cause malnutrition and induce or exacerbate stunting, leading to a long-term impact on both physical and cognitive development. This has resulted in the WHO including Shigella vaccine development as a priority goal.

VAX-GI, which includes cell-free produced IpaB conjugated to Shigella flexneri 2a polysaccharide was used to vaccinate mice which were evaluated for generation of a productive immune response and protection. All groups were challenged i.n. (pulmonary infection model) with virulent S. flexneri 2a 2457T or S. sonnei Moseley on day 57 postvaccination. Immunization with S. flexneri 2a OPS-IpaB conjugate vaccine afforded 78% protection against homologous S. flexneri 2a challenge ($P < 0.0001$) whereas S. flexneri 2a OPS-CRM provided only 50% protection ($P = 0.0014$) (Figure 27A). IpaB alone conferred 67% protection against S. flexneri 2a ($P = 0.0003$) (Figure 27A). The trend of higher protective efficacy of OPS-IpaB than of OPS-CRM or IpaB alone suggests that both OPS and IpaB contribute to the observed protective immunity. IpaB- and OPS-specific IgG titers in mice that were protected were significantly higher than titers in those that succumbed to infection (Figure 27C). Importantly, S. flexneri 2a OPS-IpaB exhibited 56% protection against heterologous S. sonnei challenge ($P < 0.0001$) (Figure 27B). Because Shigella O-polysaccharide immunity is serotype specific, this cross protection is attributable to IpaB. This is consistent with the lack of protection in the OPS-CRM group (11% survival). IpaB alone afforded 44% protection against S. sonnei ($P = 0.0003$) (Figure 27B), which was not significantly different from the protection elicited by S. flexneri 2a OPS-IpaB. IpaB-specific serum IgG was again significantly higher in mice that were protected against S. sonnei infection (Figure 27D). S. flexneri 2a and S. sonnei IpaBs share >98% homology; therefore, cross protection was expected. The slight difference in IpaB efficacy in the two experiments is likely due to the higher severity of S. sonnei infection (mice succumbed sooner). Unvaccinated control mice had very low to no survival.

Figure 27.



Our VAX-GI vaccine development program is currently funded in part by two grants obtained from the NIH administered by the University of Maryland, Baltimore. Our first grant from the NIH was awarded in April 2021 and provides for potential funding up to five years totaling approximately $0.5 million. In June 2023, we received another grant from the NIH that provides for potential funding up to five years totaling approximately $4.6 million.

Manufacturing and Supply

We have designed and developed a proprietary, scalable and portable manufacturing process for VAX-24 and VAX-31 that we believe can scale to address clinical and commercial vaccine supply needed to serve both adult and pediatric populations.

VAX-24 and VAX-31 Process

The manufacturing process for our VAX-24 and VAX-31 vaccine candidates consists of four key components: (i) our proprietary eCRM protein carrier; (ii) the 24 or 31 pneumococcal polysaccharides; (iii) the 24 or 31 conjugate drug substances; and (iv) the mixture of these 24 or 31 drug substances into the final drug product.

eCRM

Our proprietary eCRM protein carrier is produced using our cell-free protein synthesis platform, which is exclusively licensed from Sutro Biopharma for the Vaccine Field (as defined in the Sutro Biopharma License Agreement (as defined below)). eCRM, contains multiple copies of non-native para azido-methyl-phenylalanine ("pAMF") amino acid. The pAMF amino acids have a specific structure that enables eCRM to participate in the site-specific click chemistry conjugation reaction with activated pneumococcal polysaccharides.

The cell-free reaction is performed in a manner analogous to traditional fermentation but without the cells. The first step in the production of eCRM is the manufacture of critical raw materials, namely E. coli extracts and lysates that contain the cellular machinery required for in vitro DNA transcription and translation. The eCRM protein is then manufactured by combining these E. coli extracts and lysates with classic media components such as amino acids, minerals and salts, with the in vitro reaction driven by the addition of plasmid DNA coding for the eCRM protein's amino acid sequence. This cell-free reaction takes place in a standard fermenter, followed by standard protein purification chromatographic and filtration processes. The manufacturing process has consistently yielded a product of the desired quality.

Pneumococcal Polysaccharides

Each of the 24 or 31 pneumococcal polysaccharides is individually isolated from S. pneumoniae bacterial strains. Each individual S. pneumoniae strain is cultured in a bioreactor using an improved single standardized fed-batch bioreactor process and a single standardized downstream purification process. Overall, this standardized upstream and downstream process is simple and streamlined, thereby reducing manufacturing cost of goods and providing an efficient path of progression for the program from process characterization and validation through to commercialization, if our vaccine candidates are approved.

Conjugate Drug Substances

Each of the 24 or 31 conjugate drug substances is manufactured individually, as monovalent conjugates, by conjugating each of the 24 or 31 activated pneumococcal polysaccharide strains, one at a time, to the eCRM carrier protein.

Click chemistry provides for a conjugation reaction that is quick, consistent and high-yielding, and which we optimized to be largely standardized across the various polysaccharides. Through statistical design of experiment ("DoE") studies, we have gained a significant understanding of which variables to adjust to maximize product quality and, accordingly, immunogenicity in rabbit models.

Drug Product

All 24 or 31 conjugate drug substances are mixed, formulated with appropriate excipients and adsorbed onto alum. Clinical doses are filled in vials and stored refrigerated.

Key Achievements and Status

For VAX-24, we have completed the manufacturing, testing and release of all 24 drug substance conjugates and the final drug product for the Phase 1/2 and Phase 2 studies in adults and the Phase 2 study in infants. We are now progressing to Phase 3 clinical manufacturing and commercial supply activities.

For VAX-31, we have completed the manufacturing, testing and release of all 31 drug substance conjugates for the Phase 1/2 and Phase 2 studies in adults and obtained FDA clearance of the IND application. We have now completed enrollment in a Phase 1/2 clinical study in adults.

We currently do not own or operate any manufacturing facilities, but our strategic partnerships with Lonza and other contract manufacturing organizations ("CMOs") provide us with access to substantial resources to facilitate an independent supply path to the market. We have entered into agreements with Lonza, a leading global contract manufacturer with deep domain expertise and experience in large and small-scale production of clinical, as well as commercial-stage products, to secure capacity, technical expertise and resources to support the production of eCRM, polysaccharides and drug substance for our VAX-24 and VAX-31 Phase 3 programs. We have also entered into a new commercial manufacturing agreement with Lonza to support the potential global commercialization of VAX-24 and VAX-31 in both the adult and pediatric populations. This agreement complements our plans to utilize existing Lonza infrastructure to advance clinical development and the anticipated initial U.S. launch of VAX-24 or VAX-31 for the adult population. We have relationships with other leading CMOs for the production of the final drug product for VAX-24 and VAX-31, for the extract and lysates that we use to manufacture eCRM and for certain raw materials. We have an agreement with Sutro Biopharma pursuant to which Sutro Biopharma supplies us with extract and custom reagents for use in manufacturing preclinical and certain clinical supply of vaccine compositions. In December 2019, we exercised our right to require Sutro Biopharma to establish a second supplier for extract and custom reagents to support future clinical and commercial needs and thereafter initiated a tech transfer to a CMO as a second supplier of extract. In December 2022, we entered into a separate agreement with Sutro Biopharma pursuant to which we enhanced our rights with the second supplier of extract and acquired an option to access expanded rights to develop and manufacture extract, among other rights. In November 2023, we exercised this option and entered in a manufacturing rights agreement to obtain control over manufacturing and development of cell-free extract for our vaccine candidates.

Lonza Agreements

Development and Manufacturing Services Agreements

In April 2022, we entered into a non-exclusive development and manufacturing services agreement with Lonza effective as of March 22, 2022, which was subsequently amended on May 12, 2022, November 21, 2022 and October 31, 2023 (as amended, the "2022 Lonza DMSA"). Pursuant to the 2022 Lonza DMSA, Lonza is obligated to perform services including manufacturing process development and clinical manufacture and supply of our proprietary PCV candidates. Subject to the terms and conditions set forth in the 2022 Lonza DMSA, Lonza has granted to us a non-exclusive, worldwide, fully paid-up, irrevocable, transferable license, including the right to grant sublicenses, under the New General Application Intellectual Property, to research, develop, make, have made, use, sell and import the Product. Unless earlier terminated, the 2022 Lonza DMSA shall remain in place for a period of five years. Either party may terminate the 2022 Lonza DMSA for any reason on prior written notice to the other party, provided that Lonza may not exercise such right until a specified future date. In addition, either party may terminate the 2022 Lonza DMSA (i) within a given time period upon any material breach that is left uncured by the other party, or (ii) immediately if the other party becomes insolvent. We may also terminate the 2022 Lonza DMSA upon an extended force majeure event. Upon expiration and/or termination of the 2022 Lonza DMSA and/or any purchase order, we will pay Lonza for all service rendered, all costs incurred, all unreimbursed capital equipment and any cancellation fees (each term as defined in the 2022 Lonza DMSA).

In February 2023, we entered into another non-exclusive development and manufacturing services agreement with Lonza effective as of March 1, 2023 (the "2023 Lonza DMSA"). Pursuant to the 2023 Lonza DMSA, Lonza will perform manufacturing process development and the manufacture of components for VAX-24 and VAX-31, including the polysaccharide antigens, our proprietary eCRM protein carrier and conjugated drug substances. Subject to the terms and conditions set forth in the 2023 Lonza DMSA, Lonza has granted to us a non-exclusive, worldwide, fully paid-up, transferable license, including the right to grant sublicenses (subject to the prior written consent of Lonza), under the New General Application Intellectual Property, to use, sell and import the Product manufactured under the 2023 Lonza DMSA (but no other products). Unless earlier terminated, the 2023 Lonza DMSA shall remain in place for a period of five years and shall automatically renew for one additional two-year period unless either party provides written notice of non-renewal at least two years prior to the fifth anniversary of the effective date. We may terminate the 2023 Lonza DMSA for any reason on prior written notice to the other party on a Project Plan-by-Project Plan basis. Either party may terminate the 2023 Lonza DMSA (i) within a given time period upon any material breach that is left uncured by the other party, (ii) immediately if the other party becomes insolvent, is dissolved or liquidated, makes a general assignment for the benefit of its creditors, or files or has filed against it, a petition in bankruptcy or has a receiver appointed for a substantial part of its assets, (iii) upon an extended force majeure event, or (iv) if it becomes apparent to either party at any stage in the provision of the Services that it will be impossible to complete the Services for scientific or technical reasons despite exercise of best commercial efforts by both parties. Pursuant to the reason for termination and the party initiating the termination, we will pay Lonza for some combination of services rendered, costs incurred, unreimbursed capital equipment and/or any cancellation fees. Upon an extended force majeure event, neither party shall have any further liability to the other party (each term as defined in the 2023 Lonza DMSA).

Under each of the 2022 Lonza DMSA and 2023 Lonza DMSA (collectively, the "Lonza Agreements") we pay Lonza agreed-upon fees for their performance of development and manufacturing services and pass through expenses incurred by Lonza for raw materials, as well as customary procurement and handling fees. Under each Lonza Agreement, we own all rights, title and interest in and to any and all New Customer Intellectual Property (as defined in each Lonza Agreement), and Lonza owns all right, title and interest in New General Application Intellectual Property (as defined in each Lonza Agreement).

Commercial Manufacturing and Supply Agreement

On October 13, 2023, Vaxcyte Switzerland GmbH ("Vaxcyte GmbH"), a Swiss limited liability company and wholly owned subsidiary of ours, entered into a pre-commercial services and commercial manufacturing supply agreement with Lonza (the "Commercial Manufacturing and Supply Agreement").

Pursuant to the Commercial Manufacturing and Supply Agreement, Lonza will (i) construct and build out a dedicated suite (the "Suite") at Lonza's facilities in Visp, Switzerland to manufacture certain key components (including drug substance) for our proprietary PCV franchise and any other products or intermediates Vaxcyte GmbH may choose (collectively, the "Products") and (ii) maintain and operate the Suite (utilizing Lonza's employees) to manufacture the Products as a service provided to Vaxcyte GmbH, including conducting related quality control and quality assurance operations. Lonza will be a preferred, non-exclusive, supplier of the Products to Vaxcyte GmbH, and Vaxcyte GmbH retains the right to procure the Products from one or more alternate and/or backup manufacturers of the Products (including at our own facilities).

Under the Commercial Manufacturing and Supply Agreement, prior to completion of construction and certification of the Suite for commercial operation, Vaxcyte GmbH will contribute to the capital expenditure costs to construct the Suite (and will own certain equipment in the Suite to be purchased or otherwise acquired by Vaxcyte GmbH), and will pay Lonza a fixed-rate monthly service fee for Lonza's pre-commercial services prior to commencement of commercial operations (which monthly service fee amount is subject to increases in subsequent years). Following commencement of commercial operations of the Suite to manufacture the Products, Vaxcyte GmbH will pay Lonza (i) Suite fees based on allocations of certain of Lonza's costs to maintain the facility in which the Suite is located and to provide shared services to Vaxcyte GmbH and Lonza's other customers in such facility, (ii) service fees based upon Lonza's actual full-time equivalent employee ("FTE") costs to operate the Suite to manufacture the Products, and (iii) certain other pass-through costs, including for raw materials. In addition, Vaxcyte GmbH may be obligated to pay or reimburse Lonza for certain other fees and expenses under the Commercial Manufacturing and Supply Agreement. Lonza will be eligible for certain financial bonuses, and subject

to certain financial penalties, as incentives for the timely completion of certain scale-up activities, receipt of certain regulatory approvals for the Suite and manufacture of the Products in accordance with Vaxcyte GmbH's commercial requirements.

Unless earlier terminated, the Commercial Manufacturing and Supply Agreement will remain in effect until December 31, 2038, subject to automatic renewal for up to three additional renewal periods of five years each, unless Vaxcyte GmbH elects not to renew (with 24 months advanced notice to Lonza). Vaxcyte GmbH is permitted to terminate the Commercial Manufacturing and Supply Agreement for convenience or for Lonza's uncured material breach, in each case subject to certain notice obligations. Lonza is permitted to terminate the Commercial Manufacturing and Supply Agreement in the event that Vaxcyte GmbH commits certain specified material breaches, including uncured failure to pay material, undisputed amounts of money due to Lonza, subject to certain notice obligations. Either party may terminate the Commercial Manufacturing and Supply Agreement in certain circumstances in the event of the other party's bankruptcy. In the event that Vaxcyte GmbH terminates the agreement for convenience, or Lonza terminates the agreement in the event that Vaxcyte GmbH commits certain specified material breaches, then certain termination consequences may be triggered, including that (i) Vaxcyte GmbH would forfeit any outstanding entitlement to credit from Lonza of the Repurposing Fee (as defined below), and (ii) Vaxcyte GmbH would be obligated to pay Lonza a termination penalty equal to the greater of (a) CHF 70,000,000, or (b) a prespecified number of months' FTE fees for the actual FTEs assigned to Vaxcyte GmbH as of the date of termination. Within 30 days of the Effective Date, Vaxcyte GmbH paid Lonza a repurposing fee (the "Repurposing Fee") of CHF 27,000,000 that will be credited back to Vaxcyte GmbH over a 10-year period starting upon commencement of commercial production. In the event of a termination under certain circumstances, Lonza shall be obligated to provide certain wind-down and transition services to Vaxcyte GmbH for up to 12 and 24 months, respectively.

Sutro Biopharma Agreements

Sutro Biopharma is a clinical stage, publicly traded drug discovery, development and manufacturing company using precise protein engineering and rational design (enabled by Sutro Biopharma's proprietary XpressCF platform technology) to advance next-generation oncology therapeutics. Following our corporate formation, we acquired an exclusive license to Sutro Biopharma's proprietary cell-free protein synthesis platform, XpressCF, for the discovery, development and sale of vaccines for the treatment or prevention of infectious diseases, excluding cancer vaccines. Under a related supply agreement with Sutro Biopharma, we have an exclusive relationship in our field to buy extract and certain custom reagents for use in manufacturing the vaccine compositions covered by the exclusive license, which we use to produce our protein carriers and certain of our antigens. Under a separate agreement with Sutro Biopharma, we enhanced our rights with respect to access to a second supplier of extract and acquired an option to access expanded rights to develop and manufacture extract, among other rights. In November 2023, we exercised this option and entered in a manufacturing rights agreement to obtain control over manufacturing and development of cell-free extract for our vaccine candidates.

Amended and Restated License Agreement with Sutro Biopharma

We are party to an amended and restated license agreement with Sutro Biopharma, dated October 12, 2015, which was subsequently amended on May 9, 2018, May 29, 2018, September 28, 2023 and November 21, 2023 (as amended, the "Sutro Biopharma License Agreement"). Under the Sutro Biopharma License Agreement, we received an exclusive, worldwide, royalty-bearing, sublicensable license under Sutro Biopharma's patents and know-how relating to cell-free expression of proteins to (i) research, develop, use, sell, offer for sale, export, import and otherwise exploit specified vaccine compositions, such rights being sublicensable, for the treatment or prophylaxis of infectious diseases, excluding cancer vaccines, and (ii) manufacture, or have manufactured by an approved contract manufacturing organization, such vaccine compositions from extracts supplied by Sutro Biopharma pursuant to the Sutro Biopharma Supply Agreement (as described below). We are obligated to use commercially reasonable efforts to develop, obtain regulatory approval for and commercialize the vaccine compositions. In consideration of the rights granted under the Sutro Biopharma License Agreement, we are obligated to pay Sutro Biopharma a 4% royalty on worldwide aggregate annual net sales of our vaccine products for human health and a 2% royalty on such net sales of vaccine products for animal health. Such royalty rates are subject to specified reductions, including standard reductions for third-party payments and for expiration of relevant patent claims. We are also obligated to pay Sutro Biopharma any royalties due to Stanford University (the upstream

licensor of Sutro Biopharma), to the extent the royalties payable by Sutro Biopharma to Stanford University are greater than the royalties payable by us to Sutro Biopharma. Royalties are payable on a vaccine composition-by-vaccine composition and country-by-country basis until the later of expiration of the last valid claim in the licensed patents covering such vaccine composition in such country and ten years after the first commercial sale of such vaccine composition. The latest expiration date of a licensed Sutro Biopharma patent application, if issued, would be 2036, subject to any adjustment or extension of patent term that may be available in a particular country. In addition, we are obligated to pay Sutro Biopharma a percentage of net sublicensing revenue received in the low teen percentages. In addition, in the event we sublicense our non-manufacturing rights under the Sutro Biopharma License Agreement before a specified date, we are obligated to pay Sutro Biopharma a percentage, in the low double-digits, of the sublicensing revenue we receive under such agreement.

On September 28, 2023, we and Sutro Biopharma amended certain terms of the Sutro Biopharma License Agreement, including with respect to (i) royalty reduction provisions applicable in the event of expiration of relevant patent claims, which would result in lower royalties payable by us to Sutro Biopharma under certain circumstances, (ii) the ownership, prosecution, maintenance and enforcement of certain intellectual property rights licensed or arising under the Sutro Biopharma License Agreement (including as agreed to be amended in the Option Agreement (as defined below), and (iii) the timing and form for financial reporting of royalty payment calculations.

The Sutro Biopharma License Agreement will remain in effect until terminated. The agreement may be terminated by either party for the other party's material breach uncured within 60 days' notice, by us at will with 60 days' notice, or by Sutro Biopharma if we challenge Sutro Biopharma's patents or if we undergo a change of control with a specified competitor of Sutro Biopharma.

Supply Agreement with Sutro Biopharma

In May 2018, we entered into a supply agreement with Sutro Biopharma, which was subsequently amended on February 22, 2021 and November 21, 2023 (as amended, the "Sutro Biopharma Supply Agreement") pursuant to which we purchase from Sutro Biopharma extract and custom reagents for use in manufacturing non-clinical and certain clinical supply of vaccine compositions utilizing the technology licensed under the Sutro Biopharma License at prices not to exceed a specified percentage above Sutro Biopharma's fully burdened manufacturing cost. If any extracts or custom reagents do not meet the specifications and warranties provided, then we will not have an obligation to pay for the non-conforming product, and Sutro Biopharma will be obligated to replace the non-conforming product within the shortest possible time with conforming product at our cost. The term of the Sutro Biopharma Supply Agreement is from execution until the later of (i) July 31, 2022, or (ii) or the date that we and Sutro Biopharma enter into the Phase 3/Commercial Supply Agreement and Sutro is supplying to us each Product under the Phase 3/Commercial Supply Agreement (each term as defined in the Sutro Biopharma Supply Agreement). The Sutro Biopharma Supply Agreement may be terminated by either party for the other party's material breach uncured within 60 days' notice, by us at will with 60 days' notice, or by mutual agreement of the parties. In December 2019, we exercised our right to require Sutro Biopharma to establish a second supplier for extract and custom reagents to support our anticipated clinical and commercial needs.

Option Agreement with Sutro Biopharma

In December 2022, we entered into an option grant agreement with Sutro Biopharma (the "Option Agreement"). Pursuant to the Option Agreement, we acquired from Sutro Biopharma (i) authorization to enter into an agreement with an independent alternate CMO to directly source Sutro Biopharma's cell-free extract, allowing us to have direct oversight over financial and operational aspects of the relationship with the CMO; and (ii) a right, but not an obligation, to obtain certain exclusive rights to internally manufacture and/or source extract from certain CMOs and the right to independently develop and make improvements to extract (including the right to make improvements to the extract manufacturing process as well as cell lines) for use in connection with the exploitation of certain vaccine compositions (the "Option"). We and Sutro Biopharma agreed to negotiate the terms and conditions of a form definitive agreement to be entered into in the event we exercise the Option, which would include the terms and conditions set forth in an executed term sheet between us (the "Term Sheet") and such terms that were necessary to give effect to each of the terms and conditions set forth in the Term Sheet (the "Form

Definitive Agreement"). The Option period was five years from the date of the Option Agreement, subject to potential acceleration in the event we undergo a change of control.

As consideration for the Option and other rights and authorizations granted to us under the Option Agreement, we paid Sutro Biopharma upfront consideration of $22.5 million, consisting of (i) $10.0 million in cash and $7.5 million worth of shares of our common stock (the number of shares to be calculated based on the arithmetic average of the daily volume weighted average price of our common stock as traded on Nasdaq in the three consecutive trading days immediately prior to the issuance thereof), and (ii) $5.0 million payable within five business days after we and Sutro Biopharma mutually agree in writing upon the Form Definitive Agreement. The 167,780 shares of common stock issued was recorded at fair value of $8.0 million on the date of settlement, December 22, 2022. In the event that we elected to exercise the Option, we agreed to pay Sutro Biopharma an aggregate Option exercise price of $75.0 million in cash in two installments and, upon the occurrence of certain regulatory milestones, certain additional milestone payments totaling up to $60.0 million in cash.

On September 28, 2023, we and Sutro Biopharma mutually agreed in writing upon the Form Definitive Agreement to become effective in the event that we exercise the Option, and on October 2, 2023, we paid the $5.0 million accrued commitment.

On November 21, 2023 (the "Option Exercise Date"), we exercised the Option by submitting written notice thereof to Sutro Biopharma and concurrently paid Sutro Biopharma $50.0 million in cash as the first of two installment payments for the Option exercise price. Under the Option Agreement, we are obligated to pay Sutro an additional $25.0 million in cash within six months of the Option Exercise Date as the second of two installment payments for the Option exercise. Upon the occurrence of certain regulatory milestones, we would be obligated to pay Sutro Biopharma certain additional milestone payments totaling up to $60.0 million in cash. In the event that we undergo a change of control, certain rights and payments may be accelerated.

Manufacturing Rights Agreement with Sutro Biopharma

Concurrent with the payment of the first installment of the Option exercise price pursuant to the Option Agreement, on November 21, 2023, the manufacturing rights agreement (in the form of the Form Definitive Agreement) between us and Sutro Biopharma (the "Manufacturing Rights Agreement") became effective. Under the Manufacturing Rights Agreement, we received an exclusive (except as to Sutro Biopharma), perpetual (subject to termination), worldwide license, for no additional royalty (i.e., royalty-free, other than any royalties due under the Sutro Biopharma License Agreement), under Sutro Biopharma's relevant patents and know-how, to manufacture or have manufactured extract and improvements to extract (in any form) solely for use in the research, development, use, production, sale, offering for sale, export, import, commercialization or other exploitation of Vaccine Compositions (as defined in the Sutro Biopharma License Agreement) (as well as certain rights with respect to certain regulatory matters related to extract and its use in connection with such Vaccine Compositions). We have the right to extend our rights and obligations under the Manufacturing Rights Agreement to our affiliates and to sublicense our rights to manufacture extract and improvements to extract to certain third-party CMOs and other contractors (for our benefit and not for such third party's independent commercial use). For clarity, we are not permitted to manufacture extract for sale to third parties for the independent use of such third parties. Under the Manufacturing Rights Agreement, we have the obligation to protect the confidentiality of the extract manufacturing technology, and Sutro Biopharma has certain audit rights in connection therewith.

Under the Manufacturing Rights Agreement, upon our request and at our cost, Sutro Biopharma will support up to two technology transfers to us (or to an affiliate of ours or certain third-party CMOs designated by us) of certain Sutro Biopharma know-how, materials and information to enable us to manufacture or have manufactured extract. Under certain circumstances, Sutro Biopharma may source extract from us or certain third-party CMOs, subject to reimbursement for technology transfer costs.

The Manufacturing Rights Agreements contains certain terms with respect to the ownership, prosecution, maintenance and enforcement of certain intellectual property rights licensed or arising under the Manufacturing Rights Agreement, which are generally consistent with the Sutro Biopharma License Agreement.

Unless earlier terminated, the Manufacturing Rights Agreement will remain in effect in perpetuity. Sutro Biopharma may only terminate the Manufacturing Rights Agreement in the event of our (i) uncured, intentional, material breach of certain confidentiality provisions resulting in actual, material harm to Sutro Biopharma's business, (ii) uncured, intentional material breach of certain provisions relating to the use of certain of Sutro Biopharma's know-how outside of the Vaccine Field, (iii) unintentional, material breach of certain provisions relating to the use of certain of Sutro Biopharma's know-how outside of the Vaccine Field that we do not use reasonable best efforts to cease and (to the extent reasonably curable) cure in a timely fashion, or (iv) uncured failure to pay the Option exercise price or any undisputed milestone payment under the Option Agreement when due. We may terminate the Manufacturing Rights Agreement at our discretion upon 60 days' written notice, and both parties may terminate the Manufacturing Rights Agreement upon mutual written consent.

University of California, San Diego License Agreement

We are party to a license agreement with the University of California, San Diego, dated February 4, 2019, which was subsequently amended on August 16, 2019 (as amended, the "UCSD License") whereby we are the exclusive licensee of an issued U.S. patent and pending U.S. patent application related to a non-cross-reactive Group A Strep carbohydrate antigen and methods of producing the antigen. We licensed this technology for the development of our Group A Strep vaccine candidate.

Upon execution of the UCSD License, we made an upfront payment of $10,000, and each year during the term we are obligated to pay an annual license maintenance fee in the single digit thousands. We are also obligated to pay UCSD up to approximately $1 million in development and regulatory milestone payments for each licensed product under the agreement. Additionally, we are obligated to pay UCSD a fixed royalty on net sales of licensed products in the low single digits. Such royalty rate is subject standard reductions for third-party payments. Royalties are payable until expiration of the last licensed patent. Additionally, in the event we sublicense commercial rights under the UCSD License, we are obligated to pay UCSD a percentage of all sublicensing revenue received, excluding any earned royalties or reimbursements of research and development expenses, of 20% up to a maximum of $2.5 million.

We are obligated to use commercially reasonable efforts to diligently develop, manufacture and sell licensed products and to achieve specified research and clinical development milestone events. If we are unable to meet our diligence obligations and do not agree with UCSD to modify such obligations or do not cure such obligations, then UCSD may terminate the license or convert the license to non-exclusive.

The UCSD License will remain in effect until the expiration of the last licensed patent. The UCSD patent and patent application, if issued, would expire in 2032, subject to any adjustment or extension of patent term that may be available in the United States. The UCSD License may be terminated by us at will with 90 days' notice or by UCSD for our breach uncured within 90 days' notice or if we challenge the licensed patents.

Other Partners

In addition to those listed above, we seek to partner with various academic, governmental and public or private research institutions as needed to advance the discovery or development of our vaccine candidates.

Competition

In recent history, the global vaccine market has been highly concentrated among a small number of multinational pharmaceutical companies. Pfizer, Merck, GSK and Sanofi have been responsible for developing and introducing most new vaccines to the world. As a result of the COVID-19 pandemic, there have been a number of new entrants to the vaccines market, including multinational companies and emerging biopharmaceutical companies. Other pharmaceutical and biotechnology companies, academic institutions, governmental agencies and public and private research institutions are also working towards new solutions given the continuing global unmet medical need.

Within the current pneumococcal vaccine market, Pfizer, Merck and GSK have comprised the significant majority of market share and sales, with Pfizer's PCV13 and PCV20, Merck's PPSV23 and PCV15 and GSK's Synflorix totaling a combined $7.8 billion in global pneumococcal vaccine sales in 2023 (approximately 82%, 14% and 4%, of such sales for these three products, respectively). While PCV13 covers fewer pneumococcal strains than PPSV23, they deliver a T-cell dependent immune response, leading to a stronger and more durable immune response than PPSV23.

Existing vaccine makers, as well as new entrants, are competing to develop the next generation of pneumococcal vaccines. For use in adults, Merck's PCV15 was approved in July 2021 and Pfizer's PCV20 was approved by the FDA in June 2021. As a result of these approvals, the current routine standard-of-care in adults consists of the administration of either PCV20 alone or PCV15 followed by the administration of PPSV23. In June 2023, the ACIP voted to recommend shared clinical decision-making regarding the use of a supplemental PCV20 dose for adults aged 65 years and older who have completed their recommended vaccine series with both PCV13 and PPSV23.

In June 2022, Merck announced FDA approval of PCV15 for the prevention of IPD in infants and children and that ACIP unanimously voted to provisionally recommend use of PCV as an option for pneumococcal vaccination in infants and children. In September 2022, Merck announced that it received a positive opinion from the Committee for Medicinal Products for Human Use ("CHMP") for PCV15 in infants and children. In April 2023, Pfizer announced that the FDA approved PCV20 for the prevention of IPD in infants and children. In June 2023, the ACIP voted to recommend that providers choose either PCV15 or PCV20 for infants. In January 2024, Pfizer announced that it received a positive CHMP opinion for PCV20 for infants and children.

In April 2022, Merck announced that its investigational 21-valent PCV for adults, V116, received Breakthrough Therapy designation from the FDA. In November 2023, Merck presented positive results from a Phase 3 study evaluating V116 in pneumococcal vaccine-naïve adults. Merck reported that V116 elicited non-inferior immune responses compared to PCV20 for the common 10 serotypes and superior responses for 10 of the 11 unique serotypes and that safety and tolerability endpoints were met. In December 2023, Merck announced that based on these Phase 3 results, the FDA accepted for priority review a new BLA for V116 and set a PDUFA, or target action date, of June 17, 2024.

Sanofi and SK Chemicals have partnered to develop a 21-valent PCV in infants, and GSK, which acquired Affinivax, is developing an affinity-bound pneumococcal vaccine that includes 24 pneumococcal serotypes. GSK has also indicated that it has a 30-plus valent PCV candidate in preclinical development. The biotechnology company Inventprise is developing a 25-valent PCV ("PCV25") that is currently in a Phase 1/2 clinical study in young adults being conducted in Canada. In January 2024, Inventprise announced that it completed dosing in its Phase 2 study of PCV25 in adults aged 18-49 years old, and that pending the results from that study, it anticipates initiating a Phase 2 study in infants in midyear 2024 and a Phase 2 study in older adults in the second half of 2024.

We believe success will ultimately be based on the combination of several factors, including the broadest coverage of serotypes, immunogenicity, boostability, safety and tolerability. Convenience and pricing may also be factors. Other vaccines in development may obtain FDA approval and commercially launch before VAX-24 or VAX-31. However, if approved, we believe VAX-24 or VAX-31 may obtain an ACIP preferred recommendation and potentially replace both incumbents for pneumococcal disease prevention in both adult and pediatric populations

because its broader coverage and improved immune responses demonstrated in Phase 2 should compare favorably to these PCV candidates as a 24-valent or 31-valent alternative, based on our unique site-specific conjugation and carrier-sparing technology.

The competitive landscape for vaccine development for Group A Strep was dormant for more than three decades. However, the FDA lifted a 30-year ban on Group A Strep vaccine clinical trials in 2005, and research has slowly started to resurface, mostly in academic institutions. However, we are not aware of other Group A Strep vaccines in clinical development that would cover all strains of the bacteria. The GSK Vaccines Institute for Global Health is currently working on a pre-clinical vaccine candidate. We are not aware of any other vaccines under clinical development to treat periodontitis. We believe the success of our vaccine candidates in these areas will be based on potential efficacy, safety, tolerability, convenience and pricing. We are aware of some companies developing treatments for other diseases that target the same underlying pathogens that cause Group A Strep, periodontitis and Shigella.

Our commercial opportunity could be reduced or eliminated if our competitors develop and commercialize vaccines that are safer, more effective, more convenient, less expensive or with a more favorable label than VAX-24, VAX-31 or any other vaccine we may develop. Many of the companies against which we compete have significantly greater financial resources, and expertise in research and development, manufacturing, preclinical testing, conducting clinical trials, obtaining regulatory approvals and marketing approved drugs than we do.

Intellectual Property

We have developed, and are continuing to develop, a comprehensive intellectual property portfolio related to vaccine applications, including manufacturing, formulation and process applications as well as protection for our specific vaccine candidates.

Our success depends in part on our ability to obtain and maintain proprietary protection for our vaccine candidates, technology and know-how, to operate without infringing the proprietary rights of others and to prevent others from infringing our proprietary rights. Our policy is to seek to protect our proprietary position by, among other methods, pursuing and obtaining patent protection in the United States and in jurisdictions outside of the United States related to our proprietary technology, inventions, improvements and vaccine candidates that are important to the development and implementation of our business. Our patent portfolio is intended to cover our vaccine candidates and components thereof, their methods of use and processes for their manufacture and any other inventions that are commercially important to our business. We may also rely on trademarks, trade secrets and know-how to develop and maintain our proprietary position.

Generally, issued patents are granted a term of 20 years from the earliest claimed non-provisional filing date. In certain instances, patent term can be adjusted to recapture a portion of delay by the U.S. Patent and Trademark Office ("USPTO") in examining the patent application or extended to account for term effectively lost as a result of the FDA regulatory review period, or both. In addition, we cannot provide any assurance that any patents will be issued from our pending or future applications or that any issued patents will adequately protect our vaccine candidates.

Our patent portfolio as of February 27, 2024 contains two issued U.S. patents, two issued Eurasian patents, one issued South Korean patent, three issued Japanese patents, one issued Mexican patent, eight pending U.S. patent applications and two pending patent cooperation treaty applications that are solely owned by us, as well as certain foreign counterparts of a subset of these patent applications in foreign countries, including Australia, Brazil, Canada, China, India, Israel, Japan, South Korea, Taiwan, Mexico, New Zealand, the Philippines, Singapore, South Africa and countries within the European Patent Convention and the Eurasian Patent Organization. For our pneumococcal vaccines, these patent applications are directed to vaccine formulations, protein-antigen conjugates, methods of making protein-antigen conjugates and other processes related to vaccine production, and the promotion of immunogenicity using the protein-antigen conjugates and vaccines. For our Group A Strep vaccine, these patent applications are directed to vaccine formulations, protein-antigen conjugates, vaccines and components thereof, as well as processes for their manufacture. For our periodontitis vaccine, the patents and applications relate to vaccine formulations, protein antigens, and methods of using the vaccine. If issued, the 20-year term expiration dates of our

patents will expire between 2037 and 2043, not including any extension of the patent term that may be available in certain jurisdictions. We continue to seek to maximize the scope of our patent protection for all our programs.

In addition to patents, we also rely upon trademarks, trade secrets, know-how and continuing technological innovation to develop and maintain our competitive position. We maintain and are seeking both registered and common law trademarks. Common law trademark protection typically continues where and for as long as the mark is used. Registered trademarks continue in each country for as long as the trademark is registered. We believe that we have certain know-how and trade secrets relating to our technology and vaccine candidates. We rely on trade secrets to protect certain aspects of our technology related to our current and future vaccine candidates. However, trade secrets can be difficult to protect. We seek to protect our proprietary information, including trade secrets, in part, by using confidentiality agreements with our commercial partners, collaborators, employees and consultants, and invention assignment agreements with our employees. We also have confidentiality agreements or invention assignment agreements with our commercial partners and selected consultants. These agreements may be breached, and we may not have adequate remedies for any breach. In addition, our trade secrets may otherwise become known or be independently discovered by competitors. We also seek to preserve the integrity and confidentiality of our data and trade secrets by maintaining the physical security of our premises and physical and electronic security of our information technology systems. To the extent that our commercial partners, collaborators, employees and consultants use intellectual property owned by others in their work for us, disputes may arise as to the rights in related or resulting know-how and inventions.

Obtaining patents does not guarantee our right to practice the patented technology or commercialize the patented product. Third parties may have or obtain rights to patents that could be used to prevent or attempt to prevent us from commercializing our vaccine candidates. If third parties prepare and file patent applications in the United States or other jurisdictions that also claim technology to which we have rights, we may have to participate in interference or derivation proceedings in the USPTO or similar proceedings in other jurisdictions to determine the priority of invention.

Coverage and Reimbursement

Sales of our products in the United States will depend, in part, on the extent to which the costs of the products are covered by third-party payors, such as government health programs, commercial insurance and managed health care organizations. The process for determining whether a third-party payor will provide coverage for a pharmaceutical or biological product is typically separate from the process for setting the price of such a product or for establishing the reimbursement rate that the payor will pay for the product once coverage is approved. As a result, a third-party payor's decision to provide coverage for a pharmaceutical or biological product does not imply that the reimbursement rate will be adequate. Certain Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act of 2010 (collectively, the "ACA") marketplace and other private payor plans are required to include coverage for certain preventative services, including vaccinations recommended by the ACIP without cost share obligations (i.e., co-payments, deductibles or co-insurance) for plan members. Children through 18 years of age without other health insurance coverage may be eligible to receive such vaccinations free-of-charge through the CDC's Vaccines for Children program ("VFC"). For Medicare beneficiaries, vaccines may be covered under either the Part B program or Part D depending on several criteria, including the type of vaccine and the beneficiary's coverage eligibility. If our vaccine candidates, once approved, are covered only under the Part D program, physicians may be less willing to use our products because of the claims adjudication costs and time related to the claims adjudication process and collection of co-payments associated with the Part D program.

Further, no uniform policy for coverage and reimbursement exists in the United States, and coverage and reimbursement can differ significantly from payor to payor. Third-party payors often rely upon Medicare coverage policy and payment limitations in setting their own reimbursement rates, but also have their own methods and approval process apart from Medicare determinations. As such, one third-party payor's decision to cover a particular medical product or service does not ensure that other payors will also provide coverage for the medical product or service or will provide coverage at an adequate reimbursement rate. Further, coverage policies and third party reimbursement rates may change at any time. Even if favorable coverage and reimbursement status is attained for one or more products that receives regulatory approval, less favorable coverage policies and reimbursement rates may be implemented in the future.

Government Regulation

Government authorities in the United States, at the federal, state and local level, and other countries extensively regulate, among other things, the research, development, testing, safety, effectiveness, manufacture, quality control, approval, post-approval monitoring and reporting, labeling, packaging, storage, record-keeping, promotion, advertising, distribution, marketing and export and import of products such as those we are developing. A new biological product must be licensed by the FDA through the approval of a BLA, before it may be legally marketed in the United States.

In the United States, pharmaceutical products are regulated by the FDA under the Federal Food, Drug and Cosmetic Act and other laws, including, in the case of biologics, the Public Health Service Act (the "PHS Act").

Failure to comply with FDA requirements, both before and after product approval, may subject us or our partners, contract manufacturers and suppliers to administrative or judicial sanctions, including FDA refusal to approve applications, warning letters, product recalls, product seizures, total or partial suspension of production or distribution, fines and/or criminal prosecution.

The steps required before a biologic may be approved for marketing of an indication in the United States generally include:

- completion of preclinical laboratory tests, animal studies, formulation studies conducted in accordance with good laboratory practices and other applicable regulations;
- submission to the FDA of an IND application, which must be active before human clinical trial commencement;
- approval by an institutional review board ("IRB") or ethics committee at each clinical site before a clinical trial is commenced;
- completion of adequate and well-controlled human clinical trials in accordance with good clinical practice ("GCP") requirements to establish that the biological product is "safe, pure and potent," which is analogous to the safety and efficacy approval standard for a chemical drug product for its intended use;
- preparation and submission to the FDA of a BLA for marketing approval that includes substantive evidence of safety, purity and potency from results of nonclinical testing and clinical trials;
- a determination by the FDA within 60 days of its receipt of a BLA to file the application for review;
- satisfactory completion of an FDA pre-approval inspection of the manufacturing facility or facilities at which the product is produced to assess compliance with applicable current good manufacturing practices ("cGMP") to assure that the facilities, methods and controls are adequate to preserve the products identify, strength, quality and purity;
- potential FDA audit of the nonclinical and clinical trial sites that generated the data in support of the BLA; and
- FDA review of the BLA and issuance of a biologics license, which is the approval necessary to market a vaccine.

Before conducting studies in humans, laboratory evaluation of product chemistry, toxicity and formulation, as well as animal studies to assess the potential safety and efficacy of the biologic candidate, must be conducted. Preclinical toxicology studies in animals must be conducted in compliance with FDA regulations.

The results of the preclinical tests, together with manufacturing information, known as CMC, and analytical data, are submitted to the FDA as part of an IND application. Some preclinical testing may continue even after the IND application is submitted. In addition to including the results of the preclinical testing, the IND application will also include a protocol detailing, among other things, the objectives of the clinical trial, the parameters to be used in monitoring safety and the effectiveness criteria to be evaluated if the first phase or phases of the clinical trial lend themselves to an efficacy determination. The IND application will automatically become effective 30 days after receipt by the FDA unless the FDA within the 30-day time period places the IND application on clinical hold because of safety concerns about the vaccine candidate or the conduct of the trial described in the clinical protocol included in the IND application. The IND application sponsor and the FDA must resolve any outstanding concerns before clinical trials can begin. Submission of an IND application therefore may or may not result in FDA authorization to begin a clinical trial.

All clinical trials for new drugs and biologics must be conducted under the supervision of one or more qualified principal investigators in accordance with GCPs, which include the requirement that all research subjects provide their informed consent for their participation in any clinical trial. They must be conducted under protocols detailing, among other things, the objectives of the applicable phase of the trial, dosing procedures, research subject selection, exclusion criteria and the safety and effectiveness criteria to be evaluated. Each protocol must be submitted to the FDA as part of the IND application, and progress reports detailing the status of the clinical trials must be submitted to the FDA annually. Sponsors must also report to the FDA within specified timeframes, serious and unexpected adverse reactions, any clinically significant increase in the rate of a serious suspected adverse reaction over that listed in the protocol or investigator's brochure or any findings from other studies or animal or in vitro testing that suggest a significant risk in humans exposed to the vaccine candidate. An IRB at each institution participating in the clinical trial must review and approve the protocol before a clinical trial commences at that institution, approve the information regarding the trial and the consent form that must be provided to each research subject or the subject's legal representative and monitor the trial until completed.

Clinical trials are typically conducted in three sequential phases, but the phases may overlap, and different trials may be initiated with the same vaccine candidate within the same phase of development in similar or differing patient populations.

- *Phase 1:* Clinical trials may be conducted in a limited number of patients or healthy volunteers, as appropriate. The vaccine candidate is initially tested for safety and immunogenicity.

- *Phase 2*: The vaccine candidate is evaluated in a limited patient population to identify possible adverse effects and safety risks, to preliminarily evaluate the efficacy of the product for specific targeted diseases and to determine dosage tolerance, optimal dosage and dosing schedule.

- *Phase 3*: Clinical trials are undertaken to further evaluate dosage, clinical efficacy, potency and safety in an expanded patient population at geographically dispersed clinical trial sites. These clinical trials are intended to establish the overall risk/benefit ratio of the product and provide an adequate basis for product labeling.

In some cases, the FDA may require, or companies may voluntarily pursue, additional clinical trials after a product is approved to gain more information about the product. These so-called Phase 4 studies may also be made a condition to approval of the BLA. These clinical trials are used to gain additional experience from the treatment of patients in the intended therapeutic indication, particularly for long-term safety follow-up.

During all phases of clinical development, regulatory agencies require extensive monitoring and auditing of all clinical activities, clinical data and clinical trial investigators. Annual progress reports detailing the results of the clinical trials must be submitted to the FDA. Written IND application safety reports must be promptly submitted to the FDA and the investigators for serious and unexpected adverse events, any findings from other studies, tests in laboratory animals or in vitro testing that suggest a significant risk for human subjects or any clinically relevant increase in the rate of a serious suspected adverse reaction over that listed in the protocol or investigator brochure. The sponsor must submit an IND application safety report within 15 calendar days after the sponsor determines that the information qualifies for reporting. The sponsor also must notify the FDA of any

unexpected fatal or life-threatening suspected adverse reaction within seven calendar days after the sponsor's initial receipt of the information. Phase 1, Phase 2 and Phase 3 clinical trials may not be completed successfully within any specified period, if at all. The FDA or the sponsor or its data safety monitoring board may suspend a clinical trial at any time on various grounds, including a finding that the research subjects or patients are being exposed to an unacceptable health risk. Similarly, an IRB can suspend or terminate approval of a clinical trial at its institution if the clinical trial is not being conducted in accordance with the IRB's requirements or if the biological product has been associated with unexpected serious harm to patients.

Assuming successful completion of all required testing in accordance with applicable regulatory requirements, the results of the preclinical studies and clinical trials, together with other detailed information, including information on the manufacture and composition of the vaccine candidate, are submitted to the FDA as part of a BLA requesting approval to market the vaccine candidate for a proposed indication or indications. The BLA must include all relevant data available from preclinical and clinical trials, including negative or ambiguous results as well as positive findings, together with detailed information relating to the product's CMC and proposed labeling, among other things. Under the Prescription Drug User Fee Act, the fees payable to the FDA for reviewing a BLA, as well as annual program user fees for approved products, can be substantial but are subject to certain limited deferrals, waivers and reductions that may be available. Additionally, no user fees are assessed on BLAs for products designated as orphan drugs, unless the product also includes a non-orphan indication. Each BLA submitted to the FDA for approval is reviewed for administrative completeness and reviewability within 60 days following receipt by the FDA of the application. If the BLA is found complete, the FDA will file the BLA, triggering a full review of the application. The FDA may refuse to file any BLA that it deems incomplete or not properly reviewable at the time of submission. The FDA's established goal is to review 90% of priority BLAs within six months after the application is accepted for filing and 90% of standard BLAs within 10 months of the acceptance date, whereupon a review decision is to be made. Priority review will direct overall attention and resources to the evaluation of applications for products that, if approved, would be significant improvements in the safety or effectiveness of the treatment, diagnosis or prevention of serious conditions. In both standard and priority reviews, the review process is often significantly extended by FDA requests for additional information or clarification. The FDA reviews a BLA to determine, among other things, whether a product is safe, pure and potent and the facility in which it is manufactured, processed, packed or held meets standards designed to assure the product's continued safety, purity and potency. The FDA may also convene an advisory committee to provide clinical insight on application review questions. The FDA is not bound by recommendations of an advisory committee, but it considers such recommendations when making decisions regarding approval.

Before approving a BLA, the FDA will typically inspect the facility or facilities where the product is manufactured. The FDA will not approve an application unless it determines that the manufacturing processes and facilities are in compliance with cGMP and adequate to assure consistent production of the product within required specifications. Additionally, before approving a BLA, the FDA will typically inspect one or more clinical sites to assure compliance with GCP. If the FDA determines that the application, manufacturing process or manufacturing facilities are not acceptable, it will outline the deficiencies in the submission and often will request additional testing or information. Notwithstanding the submission of any requested additional information, the FDA ultimately may decide that the application does not satisfy the regulatory criteria for approval.

After the FDA evaluates a BLA and conducts inspections of manufacturing facilities where the investigational product and/or its drug substance will be produced, the FDA may issue an approval letter or a Complete Response Letter. An approval letter authorizes commercial marketing of the product with specific prescribing information for specific indications. A Complete Response Letter will describe all of the deficiencies that the FDA has identified in the BLA, except that where the FDA determines that the data supporting the application are inadequate to support approval, the FDA may issue the Complete Response Letter without first conducting required inspections, testing submitted product lots and/or reviewing proposed labeling. In issuing the Complete Response Letter, the FDA may recommend actions that the applicant might take to place the BLA in condition for approval, including requests for additional information or clarification. The FDA may delay or refuse approval of a BLA if applicable regulatory criteria are not satisfied, require additional testing or information and/or require post-marketing testing and surveillance to monitor the safety or efficacy of a product.

If a product is approved, the approval may impose limitations on the uses for which the product may be marketed, may require that warning statements be included in the product labeling, may require that additional

studies be conducted following approval as a condition of the approval and may impose restrictions and conditions on product distribution, prescribing or dispensing in the form of a Risk Evaluation and Mitigation Strategy ("REMS"), or otherwise limit the scope of any approval. A REMS is a safety strategy to manage a known or potential serious risk associated with a medicine and to enable patients to have continued access to such medicines by managing their safe use, and could include medication guides, physician communication plans or elements to assure safe use, such as restricted distribution methods, patient registries and other risk minimization tools. The FDA also may condition approval on, among other things, changes to proposed labeling or the development of adequate controls and specifications. In most cases, the FDA must approve a BLA supplement or a new BLA before a product may be marketed for other uses or before specific manufacturing or other changes may be made to the approved product. As a condition of approval, the FDA may also require one or more Phase 4 post-market studies and surveillance to further assess and monitor the product's safety and effectiveness after commercialization, and may limit further marketing of the product based on the results of these post-marketing studies. Also, product approvals may be withdrawn if compliance with regulatory standards is not maintained or if safety or manufacturing problems occur following initial marketing. In addition, new government requirements may be established that could delay or prevent regulatory approval of our vaccine candidates under development.

Both before and after the FDA approves a product, the manufacturer and the holder or holders of the BLA for the product are subject to comprehensive regulatory oversight. For example, quality control and manufacturing procedures must conform, on an ongoing basis, to cGMP requirements, and the FDA periodically inspects manufacturing facilities to assess compliance with cGMPs. Accordingly, manufacturers must continue to spend time, money and effort to maintain cGMP compliance.

Post-Approval Requirements

Any drug products manufactured or distributed by us or our partners pursuant to FDA approvals will be subject to pervasive and continuing regulation by the FDA, including, among other things, record-keeping requirements, reporting of adverse experiences with the drug, providing the FDA with updated safety and efficacy information, distribution requirements, complying with individual electronic records and signature requirements and complying with FDA promotion and advertising requirements. Once approval is granted, the FDA may withdraw the approval if compliance with regulatory standards is not maintained or if problems occur after the product reaches the market. After approval, most changes to the approved product, such as adding new indications, specific manufacturing changes and additional labeling claims, are subject to further FDA review and approval. Biologic manufacturers, their subcontractors and other entities involved in the manufacture and distribution of approved drugs are required to register their establishments with the FDA and certain state agencies and are subject to periodic unannounced inspections by the FDA and certain state agencies for compliance with cGMP regulations and other laws and regulations. Changes to the manufacturing process are strictly regulated and, depending on the significance of the change, may require prior FDA approval before being implemented. FDA regulations also require investigation and correction of any deviations from cGMP and impose reporting requirements upon us and any third-party manufacturers that we may decide to use. Accordingly, manufacturers must continue to expend time, money and effort in the area of production and quality control to maintain compliance with cGMP and other aspects of regulatory compliance.

Discovery of previously unknown problems, including adverse events of unanticipated severity or frequency, or the failure to comply with the applicable regulatory requirements may result in restrictions on the marketing of a product or withdrawal of the product from the market as well as possible civil or criminal sanctions. Failure to comply with the applicable U.S. requirements at any time during the product development process, approval process or after approval, may subject an applicant or manufacturer to administrative or judicial civil or criminal sanctions and adverse publicity. FDA sanctions could include refusal to approve pending applications, withdrawal or suspension of an approval or license, clinical holds, warning or untitled letters, product recalls, product seizures, safety alerts, Dear Healthcare Provider letters, total or partial suspension of production or distribution, injunctions, fines, refusals of government contracts, mandated corrective advertising or communications with doctors, debarment, restitution, disgorgement of profits, consent decrees or civil or criminal penalties.

The FDA strictly regulates labeling, advertising, promotion and other types of information on products that are placed on the market and imposes requirements and restrictions on drug manufacturers, such as those related

to direct-to-consumer advertising, the prohibition on promoting products for uses or inpatient populations that are not described in the product's approved labeling (known as "off-label use"), industry-sponsored scientific and educational activities and promotional activities involving the internet. Failure to comply with these requirements can result in, among other things, adverse publicity, warning letters, corrective advertising and potential civil and criminal penalties. Physicians may prescribe legally available products for uses that are not described in the product's labeling and that differ from those tested by us and approved by the FDA. Such off-label uses are common across medical specialties. Physicians may believe that such off-label uses are the best treatment for many patients in varied circumstances. The FDA does not regulate the behavior of physicians in their choice of treatments. The FDA does, however, restrict the manufacturer's communications on the subject of off-label use of their products.

Additional Controls for Biologics

To help reduce the increased risk of the introduction of adventitious agents, the PHS Act emphasizes the importance of manufacturing controls for products whose attributes cannot be precisely defined. The PHS Act also provides authority to the FDA to immediately suspend licenses in situations where there exists a danger to public health, to prepare or procure products in the event of shortages and critical public health needs, and to authorize the creation and enforcement of regulations to prevent the introduction or spread of communicable diseases in the United States and between states.

After a BLA is approved, the product will also be subject to official lot release as a condition of approval. As part of the manufacturing process, the manufacturer is required to perform specific tests on each lot of the product before it is released for distribution. If the product is subject to an official release by the FDA, the manufacturer submits samples of each lot of product to the FDA together with a release protocol showing a summary of the history of the manufacture of the lot and the results of all the manufacturer's tests performed on the lot. The FDA may also perform specific confirmatory tests on lots of some products, such as vaccines, before releasing the lots for distribution by the manufacturer. In addition, the FDA conducts laboratory research related to the regulatory standards on the safety, purity, potency and effectiveness of biological products. As with drugs, after approval of biologics, manufacturers must address any safety issues that arise, are subject to recalls or a halt in manufacturing and are subject to periodic inspection after approval.

Expedited Development and Review Programs

A sponsor may seek approval of its vaccine candidate under programs designed to accelerate the FDA's review and approval of new drugs and biological products that meet certain criteria. Specifically, new drugs and biological products are eligible for fast track designation if they are intended to treat a serious or life-threatening disease or condition and demonstrate the potential to address unmet medical needs for the disease or condition. For a fast track product, the FDA may consider sections of the BLA for review on a rolling basis before the complete application is submitted, if the sponsor provides a schedule for the submission of the sections of the application, the FDA agrees to accept sections of the application and determines that the schedule is acceptable and the sponsor pays any required user fees upon submission of the first section of the application. A fast track designated vaccine candidate may also qualify for priority review, under which the FDA sets the target date for FDA action on the BLA at six months after the FDA accepts the application for filing. Priority review is granted when there is evidence that the proposed product would be a significant improvement in the safety or effectiveness of the treatment, diagnosis or prevention of a serious disease or condition. If criteria are not met for priority review, the application is subject to the standard FDA review period of 10 months after FDA accepts the application for filing. Priority review designation does not change the scientific/medical standard for approval or the quality of evidence necessary to support approval.

Under the accelerated approval program, the FDA may approve a BLA on the basis of either a surrogate endpoint that is reasonably likely to predict clinical benefit, or on a clinical endpoint that can be measured earlier than irreversible morbidity or mortality, that is reasonably likely to predict an effect on irreversible morbidity or mortality or other clinical benefit, taking into account the severity, rarity or prevalence of the condition and the availability or lack of alternative treatments. Post-marketing studies or completion of ongoing studies after marketing approval are generally required to verify the biologic's clinical benefit in relationship to the surrogate endpoint or ultimate outcome in relationship to the clinical benefit. In addition, the FDA currently requires as a condition for accelerated approval pre-approval of promotional materials, which could adversely impact the timing

of the commercial launch of the product. FDA may withdraw approval of a drug or indication approved under accelerated approval if, for example, the confirmatory trial fails to verify the predicted clinical benefit of the product.

In addition, a sponsor may seek FDA designation of its vaccine candidate as a breakthrough therapy if the vaccine candidate is intended to treat a serious or life-threatening disease or condition and preliminary clinical evidence indicates that the therapy may demonstrate substantial improvement over existing therapies on one or more clinically significant endpoints, such as substantial treatment effects observed early in clinical development. If the FDA designates a product as a breakthrough therapy, it may take actions appropriate to expedite the development and review of the application, which may include holding meetings with the sponsor and the review team throughout the development of the therapy; providing timely advice to, and interactive communication with, the sponsor regarding the development of the drug to ensure that the development program to gather the nonclinical and clinical data necessary for approval is as efficient as practicable; involving senior managers and experienced review staff, as appropriate, in a collaborative, cross-disciplinary review; assigning a cross-disciplinary project lead for the FDA review team to facilitate an efficient review of the development program and to serve as a scientific liaison between the review team and the sponsor; and considering alternative clinical trial designs when scientifically appropriate, which may result in smaller trials or more efficient trials that require less time to complete and may minimize the number of patients exposed to a potentially less efficacious treatment. Breakthrough therapy designation comes with all of the benefits of fast track designation.

Even if a drug or biologic qualifies for one or more of these programs, the FDA may later decide that the drug no longer meets the conditions for qualification or that the time period for FDA review or approval will be shortened.

Biosimilars and Exclusivity

The ACA includes a subtitle called the Biologics Price Competition and Innovation Act of 2009 ("BPCIA") which created an abbreviated approval pathway for biological products that are biosimilar to or interchangeable with an FDA-licensed reference biological product. The FDA has issued several guidance documents outlining an approach to review and approval of biosimilars. Biosimilarity, which requires that there be no clinically meaningful differences between the biological product and the reference product in terms of safety, purity and potency, can be shown through analytical studies, animal studies and a clinical trial or trials. Interchangeability requires that a product is biosimilar to the reference product and the product must demonstrate that it can be expected to produce the same clinical results as the reference product in any given patient and, for products that are administered multiple times to an individual, the biologic and the reference biologic may be alternated or switched after one has been previously administered without increasing safety risks or risks of diminished efficacy relative to exclusive use of the reference biologic.

Under the BPCIA, an application for a biosimilar product may not be submitted to the FDA until four years following the date that the reference product was first licensed by the FDA. In addition, the approval of a biosimilar product may not be made effective by the FDA until 12 years from the date on which the reference product was first licensed. During this 12-year period of exclusivity, another company may still market a competing version of the reference product if the FDA approves a full BLA for the competing product containing that applicant's own preclinical data and data from adequate and well-controlled clinical trials to demonstrate the safety, purity and potency of its product. The BPCIA also created certain exclusivity periods for biosimilars approved as interchangeable products. A biological product can also obtain pediatric market exclusivity in the United States. Pediatric exclusivity, if granted, adds six months to existing exclusivity periods and patent terms. This six-month exclusivity, which runs from the end of other exclusivity protection or patent term, may be granted based on the voluntary completion of a pediatric study in accordance with an FDA-issued "Written Request" for such a study.

United States Healthcare Reform

In the United States, there has been and continues to be, several legislative and regulatory changes and proposed changes regarding the healthcare system that could, among other things, prevent or delay marketing approval of vaccine candidates, restrict or regulate post-approval activities and affect the profitable sale of vaccine candidates.

Among policymakers and payors in the United States, there is significant interest in promoting changes in healthcare systems with the stated goals of containing healthcare costs, improving quality and/or expanding access. In the United States, the pharmaceutical industry has been a particular focus of these efforts and has been significantly affected by major legislative initiatives. For example, in March 2010, the ACA was passed, which substantially changed the way healthcare is financed by both the government and private insurers and significantly impacts the U.S. pharmaceutical industry. The ACA, among other things: (i) increased the minimum Medicaid rebates owed by manufacturers under the Medicaid Drug Rebate Program and extended the rebate program to individuals enrolled in Medicaid managed care organizations; (ii) created a new methodology by which rebates owed by manufacturers under the Medicaid Drug Rebate Program are calculated for certain drugs and biologics that are inhaled, infused, instilled, implanted or injected; (iii) established an annual, nondeductible fee on any entity that manufactures or imports certain specified branded prescription drugs and biologic agents apportioned among these entities according to their market share in specific government healthcare programs; (iv) expanded the eligibility criteria for Medicaid programs; (v) created a new Patient-Centered Outcomes Research Institute to oversee, identify priorities in, and conduct comparative clinical effectiveness research, along with funding for such research; (vi) created a new Medicare Part D coverage gap discount program, in which manufacturers must now agree to offer 70% point-of-sale discounts off negotiated prices of applicable brand drugs to eligible beneficiaries during their coverage gap period, as a condition for the manufacturer's outpatient drugs to be covered under Medicare Part D; and (vii) established a Center for Medicare & Medicaid Innovation at the Centers for Medicare & Medicaid Services ("CMS") to test innovative payment and service delivery models to lower Medicare and Medicaid spending, potentially including prescription drugs.

There have been judicial and political challenges to certain aspects of the ACA. By way of example, the Tax Cuts and Jobs Act of 2017 (the "Tax Act") was signed into law and included a provision repealing, effective January 1, 2019, the tax-based shared responsibility payment imposed by the ACA on specific individuals who fail to maintain qualifying health coverage for all or part of a year that is commonly referred to as the "individual mandate." The Bipartisan Budget Act of 2018, among other things, amends the ACA, effective January 1, 2019, to close the coverage gap in most Medicare drug plans, commonly referred to as the "donut hole." On June 17, 2021, the U.S. Supreme Court dismissed a challenge on procedural grounds that argued the ACA is unconstitutional in its entirety because the "individual mandate" was repealed by Congress. Prior to the U.S. Supreme Court ruling on January 28, 2021, President Biden issued an executive order that initiated a special enrollment period for purposes of obtaining health insurance coverage through the ACA marketplace. The executive order also instructed certain governmental agencies to review and reconsider their existing policies and rules that limit access to healthcare, including among others, reexamining Medicaid demonstration projects and waiver programs that include work requirements, and policies that create unnecessary barriers to obtaining access to health insurance coverage through Medicaid or the ACA. On August 16, 2022, President Biden signed the Inflation Reduction Act of 2022 ("IRA") into law, which among other things, extends enhanced subsidies for individuals purchasing health insurance coverage in ACA marketplaces through plan year 2025. The IRA also eliminates the "donut hole" under the Medicare Part D program beginning in 2025 by significantly lowering the beneficiary maximum out-of-pocket cost and creating a new manufacturer discount program. It is unclear how any additional healthcare reform measures of the Biden administration will impact the ACA and our business.

Other legislative changes have been proposed and adopted since the ACA was enacted. For example, on August 2, 2011, the Budget Control Act of 2011 was signed into law, which, among other things, resulted in aggregate reductions of Medicare payments to providers of 2% per fiscal year, which went into effect on April 1, 2013 and, due to subsequent legislative amendments to the statute, including the Infrastructure Investment and Jobs Act, will remain in effect through 2032, unless additional Congressional action is taken. On January 2, 2013, the American Taxpayer Relief Act of 2012 was signed into law, which, among other things, reduced Medicare payments to several providers, including hospitals, and increased the statute of limitations period for the government to recover overpayments to providers from three to five years.

Moreover, there has recently been heightened governmental scrutiny over the manner in which manufacturers set prices for their marketed products, which has resulted in several Congressional inquiries, presidential executive orders and proposed and enacted federal and state legislation designed to, among other things, bring more transparency to product pricing, review the relationship between pricing and manufacturer patient programs and reform government program reimbursement methodologies for drug products. At the federal level in July 2021, the Biden administration released an executive order, "Promoting Competition in the American

Economy," with multiple provisions aimed at prescription drugs. In response to Biden's executive order, on September 9, 2021, the Department of Health and Human Services ("HHS") released a Comprehensive Plan for Addressing High Drug Prices that outlines principles for drug pricing reform and sets out a variety of potential legislative policies that Congress could pursue as well as potential administrative actions HHS can take to advance these principles. The IRA also, among other things, (i) requires HHS to negotiate the price of certain high-expenditure, single-source drugs and biologics under Medicare Part B and Medicare Part D, and subject drug manufacturers to civil monetary penalties and a potential excise tax if they do not offer Medicare a price that is equal to or less than the negotiated "maximum fair price" under the law, and (ii) imposes rebates for certain drugs and biologics sold under Medicare Part B and Medicare Part D to penalize price increases that outpace inflation. Unless an exception applies, single-source vaccines can qualify for Medicare price negotiations 11 years after their BLA is approved and become subject to the IRA's negotiated maximum fair price ceiling two years after that. However, certain vaccines, including pneumococcal virus vaccines, are excluded from the Medicare Part B inflation rebate. Additionally, CMS has stated in guidance released on February 9, 2023, that it will not impose Medicare Part D inflation rebates at this time on vaccines and other drugs and biologics that are not "covered outpatient drugs" under Medicaid or otherwise do not have an obligation to report drug pricing data to Medicaid. Further, as of January 1, 2023, the IRA eliminates patient cost sharing for FDA-approved adult vaccines that are recommended by the ACIP, and covered under Medicare Part D and mandates that all state Medicaid programs cover FDA-approved adult vaccines that are recommended by the ACIP and their administration without cost sharing starting October 1, 2023. However, the IRA does not change either VFC or the related provisions added in 2010 under the ACA. VFC was established to give first-dollar coverage to children up to 18 years of age whose families could not pay for vaccinations while the ACA guaranteed coverage of vaccines without cost sharing for Americans who are either privately insured or newly covered in states that expanded Medicaid. The IRA permits HHS to implement many of these provisions through guidance, as opposed to regulation, for the initial years. These provisions take effect progressively starting in fiscal year 2023. On August 29, 2023, HHS announced the list of the first ten drugs that will be subject to price negotiations, although the Medicare drug price negotiation program is currently subject to legal challenges. It is currently unclear how the IRA will be effectuated but is likely to have a significant impact on the pharmaceutical industry. Further in response to the Biden administration's October 2022 executive order, on February 14, 2023, HHS released a report outlining three new models for testing by the CMS Innovation Center which will be evaluated on their ability to lower the cost of drugs, promote accessibility, and improve quality of care. It is unclear whether the models will be utilized in any health reform measures in the future. Further, on December 7, 2023, the Biden administration announced an initiative to control the price of prescription drugs through the use of march-in rights under the Bayh-Dole Act. On December 8, 2023, the National Institute of Standards and Technology published for comment a Draft Interagency Guidance Framework for Considering the Exercise of March-In Rights which for the first time includes the price of a product as one factor an agency can use when deciding to exercise march-in rights. While march-in rights have not previously been exercised, it is uncertain if that will continue under the new framework. At the state level, legislatures have increasingly passed legislation and implemented regulations designed to regulate pharmaceutical product pricing, including price or reimbursement constraints, discounts, restrictions on specific product access, marketing cost disclosure and transparency measures and, in some cases, measures designed to encourage importation from other countries and bulk purchasing.

United States Healthcare Fraud and Abuse Laws and Compliance Requirements

Federal and state healthcare laws and regulations restrict certain business practices in the biopharmaceutical industry, including anti-kickback and false claims laws and regulations, data privacy and security laws and regulations and transparency laws and regulations.

The federal Anti-Kickback Statute prohibits, among other things, individuals or entities from knowingly and willfully offering, paying, soliciting or receiving remuneration, directly or indirectly, overtly or covertly, in cash or in-kind to induce or in return for purchasing, leasing, ordering or arranging for or recommending the purchase, lease or order of any item or service reimbursable under Medicare, Medicaid or other federal healthcare programs. A person or entity does not need to have actual knowledge of this statute or specific intent to violate it in order to have committed a violation.

The federal civil and criminal false claims laws, including the civil False Claims Act, and civil monetary penalties laws, prohibit, among other things, any individual or entity from knowingly presenting, or causing to be presented, a false claim for payment to the federal government or knowingly making, using or causing to be made or

used a false record or statement material to a false or fraudulent claim to the federal government. Private individuals, commonly known as "whistleblowers," can bring civil False Claims Act qui tam actions, on behalf of the government and such individuals and may share in amounts paid by the entity to the government in recovery or settlement. In addition, the government may assert that a claim including items or services resulting from a violation of the federal Anti-Kickback Statute constitutes a false or fraudulent claim for purposes of the civil False Claims Act.

The federal Health Insurance Portability and Accountability Act of 1996 ("HIPAA") created additional federal civil and criminal statutes that prohibit, among other things, knowingly and willfully executing a scheme to defraud any healthcare benefit program. Similar to the federal Anti-Kickback Statute, a person or entity does not need to have actual knowledge of the statute or specific intent to violate it in order to have committed a violation. In addition, HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act, and their implementing regulations, imposes specific requirements relating to the privacy, security and transmission of protected health information on HIPAA covered entities, which include certain healthcare providers, health plans and healthcare clearinghouses and their business associates and covered subcontractors who conduct certain activities for or on their behalf involving protected health information on their behalf.

The federal Physician Payments Sunshine Act requires certain manufacturers of drugs, devices, biologics and medical supplies for which payment is available under Medicare, Medicaid or the Children's Health Insurance Program, with specific exceptions, to report annually to CMS information related to payments or other transfers of value made to physicians (defined to include doctors, dentists, optometrists, podiatrists and chiropractors), other healthcare professionals (such as physician assistants and nurse practitioners) and teaching hospitals, and applicable manufacturers and applicable group purchasing organizations to report annually to CMS ownership and investment interests held by physicians and their immediate family members. Similar state, local and foreign healthcare laws and regulations may also restrict business practices in the pharmaceutical industry, such as state anti-kickback and false claims laws, which may apply to business practices, including but not limited to, research, distribution, sales and marketing arrangements and claims involving healthcare items or services reimbursed by non-governmental third-party payors, including private insurers, or by patients themselves; state laws that require pharmaceutical companies to comply with the pharmaceutical industry's voluntary compliance guidelines and the relevant compliance guidance promulgated by the federal government, or otherwise restrict payments that may be made to healthcare providers and other potential referral sources; state laws and regulations that require drug manufacturers to file reports relating to pricing and marketing information or which require tracking gifts and other remuneration and items of value provided to physicians, other healthcare providers and entities; state and local laws that require the registration of pharmaceutical sales representatives; and state and local laws governing the privacy and security of health information in some circumstances, many of which differ from each other in significant ways and often are not preempted by HIPAA, thus complicating compliance efforts.

Efforts to ensure compliance with applicable healthcare laws and regulations can involve substantial costs. Violations of healthcare laws can result in significant penalties, including the imposition of significant civil, criminal and administrative penalties, damages, monetary fines, disgorgement, individual imprisonment, possible exclusion from participation in Medicare, Medicaid and other U.S. healthcare programs, integrity oversight and reporting obligations, contractual damages, reputational harm, diminished profits and future earnings and curtailment or restructuring of operations.

Foreign Regulation

In addition to regulations in the United States, we expect to be subject to a variety of foreign regulations governing clinical trials and commercial sales and distribution of our vaccine candidates. Whether or not we obtain FDA approval for a vaccine candidate, we must obtain approval from the comparable regulatory authorities of foreign countries or economic areas, such as the European Union, before we may commence clinical trials or market products in those countries or areas. The approval process and requirements governing the conduct of clinical trials, product licensing, pricing and reimbursement vary greatly from place to place, and the time may be longer or shorter than that required for FDA approval.

Certain countries outside of the United States have a process that requires the submission of a clinical trial application, much like an IND prior to the commencement of human clinical trials. In Europe, for example, a

clinical trial application ("CTA") must be submitted to the competent national health authority and to independent ethics committees in each country in which a company intends to conduct clinical trials. Once the CTA is approved in accordance with a country's requirements, clinical trial development may proceed in that country. In all cases, the clinical trials must be conducted in accordance with GCPs and other applicable regulatory requirements.

The requirements and process governing the conduct of clinical trials, product licensing, pricing and reimbursement vary from country to country. In all cases, the clinical trials are conducted in accordance with GCP and the applicable regulatory requirements and the ethical principles that have their origin in the Declaration of Helsinki.

Under European Union regulatory systems, a company may submit marketing authorization applications either under a centralized or decentralized procedure. The centralized procedure is compulsory for medicinal products produced by biotechnology or those medicinal products containing new active substances for specific indications such as the treatment of AIDS, cancer, neurodegenerative disorders, diabetes, viral diseases and designated orphan medicines, and optional for other medicines which are highly innovative. Under the centralized procedure, a marketing application is submitted to the European Medicines Agency ("EMA") where it will be evaluated by the Committee for Medicinal Products for Human Use, and a favorable opinion typically results in the grant by the European Commission of a single marketing authorization that is valid for all European Union member states within 67 days of receipt of the opinion. The initial marketing authorization is valid for five years, but once renewed is usually valid for an unlimited period.

To market a medicinal product in the European Economic Area ("EEA"), which is comprised of the 28 Member States of the EU plus Norway, Iceland and Liechtenstein, we must obtain a Marketing Authorization, ("MA"). There are two types of marketing authorizations:

- The Community MA, which is issued by the European Commission through the Centralized Procedure, based on the opinion of the Committee for Medicinal Products for Human Use of the EMA, and which is valid throughout the entire territory of the EEA. The Centralized Procedure is mandatory for certain types of products, such as biotechnology medicinal products, orphan medicinal products, advanced therapy products and medicinal products containing a new active substance indicated for the treatment certain diseases, such as AIDS, cancer, neurodegenerative disorders, diabetes, auto-immune and viral diseases. The Centralized Procedure is optional for products containing a new active substance not yet authorized in the EEA, or for products that constitute a significant therapeutic, scientific or technical innovation or which are in the interest of public health in the EU; and

- National MAs, which are issued by the competent authorities of the Member States of the EEA and only cover their respective territory, are available for products not falling within the mandatory scope of the Centralized Procedure. Where a product has already been authorized for marketing in a Member State of the EEA, this National MA can be recognized in another Member State through the Mutual Recognition Procedure. If the product has not received a National MA in any Member State at the time of application, it can be approved simultaneously in the various Member States through the Decentralized Procedure.

Under the above-described procedures, before granting the MA, the EMA, or the competent authorities of the Member States of the EEA make an assessment of the risk-benefit balance of the product on the basis of scientific criteria concerning its quality, safety and efficacy.

If we fail to comply with applicable foreign regulatory requirements, we may be subject to, among other things, fines, suspension or withdrawal of regulatory approvals, product recalls, seizure of products, operating restrictions and criminal prosecution.

Additional Regulation

We are also subject to regulation under the Occupational Safety and Health Act, the Environmental Protection Act, the Toxic Substances Control Act, the Resource Conservation and Recovery Act and other present and potential federal, state or local regulations. These and other laws govern our use, handling and disposal of various biological and chemical substances used in, and waste generated by our operations. Our research and development involve the controlled use of hazardous materials, chemicals, bacteria and viruses. Although we believe that our safety procedures for handling and disposing of such materials comply with the standards prescribed by state and federal regulations, the risk of accidental contamination or injury from these materials cannot be completely eliminated. In the event of such an accident, we could be held liable for any damages that result and any such liability could exceed our resources.

There have been a number of federal and state proposals during the last few years regarding the pricing of pharmaceutical and biological products, government control and other changes to the healthcare system of the United States. It is uncertain what legislative proposals will be adopted or what actions federal, state or private payors for medical goods and services may take in response to any healthcare reform proposals or legislation. We cannot predict the effect medical or healthcare reforms may have on our business, and no assurance can be given that any such reforms will not have a material adverse effect.

Privacy and Data Protection Laws

We are, or may become subject to numerous data privacy and security obligations, including federal, state, local, and foreign laws, regulations, guidance, and industry standards related to data privacy, security, and the protection of health-related and other personal data. Such obligations may include, without limitation, the Federal Trade Commission Act, the California Consumer Privacy Act of 2018, as amended by the California Privacy Rights Act of 2020 (the "CPRA" and collectively, the "CCPA"), the European Union's General Data Protection Regulation 2016/679 (the "EU GDPR"), and the EU GDPR as it forms part of the United Kingdom (the "UK") law by virtue of section 3 of the European Union (Withdrawal) Act 2018, or the UK GDPR, and the ePrivacy Directive. In addition, numerous U.S. states — including California, Colorado, Connecticut, Utah, and Virginia — have enacted comprehensive data privacy laws in the past few years.

Foreign data privacy and security laws (including but not limited to the EU GDPR and UK GDPR) may impose significant and complex compliance obligations on entities that are subject to those laws. As one example, the EU GDPR applies to any company established in the EEA, and to companies established outside the EEA that process personal data in connection with the offering of goods or services to data subjects in the EEA or the monitoring of the behavior of data subjects in the EEA. Failure to comply with the requirements of the EU GDPR and the applicable national data protection laws of the EU member states may result in: temporary or definite bans on processing of personal data and other corrective actions; fines of up to €20,000,000 or up to 4% of the total worldwide annual turnover of the preceding financial year, whichever is higher, and other administrative penalties; or private litigation related to processing of personal data brought by classes of data subjects or consumer protection organizations authorized at law to represent their interests.

See the section titled "Risks Related to Government Regulation" for additional information about the laws and regulations to which we are or may become subject to and about the risks to our business associated with such laws and regulations.

Employees & Human Capital

As of December 31, 2023, we had 254 full-time employees, 35 of whom have Ph.D. degrees. None of our employees are represented by labor unions or covered by collective bargaining agreements. We consider our relationship with our employees to be good.

We recognize that identifying, attracting, incentivizing, integrating, retaining and promoting talented employees is vital to our success, particularly as we continue to grow. We aim to create an equitable, inclusive and empowering environment in which our employees can grow and advance their careers, with the overall goal of developing, expanding and retaining our workforce to support our current pipeline and future business goals. Our efforts to recruit and retain a diverse and passionate workforce include providing competitive compensation, including equity incentive compensation, and comprehensive benefits that provide resources to help our employees.

Training and educating our employees is key to our organizational success. We endeavor to provide in person and virtual trainings, as well as experiential learning through cross-functional exposure via presentations or shadowing opportunities. In addition, we value our employee's opinions and thoughts and provide virtual and onsite forums where our employees can provide feedback on corporate initiatives, recognize each other's contributions and accomplishments, and provide other suggestions for improving our evolving workplace. We prioritize employee feedback and conduct an employee survey to measure employee engagement and to inform future talent initiatives.

In addition, we are committed to our employees' health, safety and well-being. In March 2020, in response to the COVID-19 pandemic, we adjusted our workplace policies to allow employees to work from home and we remodeled our work paradigm to one that is flexible and designed to accommodate a range of work profiles from office based to hybrid to fully remote, allowing us to maximize productivity and performance. We leveraged remote hiring supported by virtual processes through which we provided a high level of interpersonal engagement and continued to expand our robust onboarding program to ensure all new hires are grounded in our business and culture.

Corporate and Other Information

We are headquartered in San Carlos, California. We were incorporated in the state of Delaware on November 27, 2013 as SutroVax, Inc. and we changed our name to Vaxcyte, Inc. in May 2020. Our website is located at https://www.vaxcyte.com. Our Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K including their exhibits, proxy and information statements, and amendments to those reports filed or furnished pursuant to Section 13(a), 14, and 15(d) of the Securities Exchange Act of 1934 (as amended, the "Exchange Act") are available through the "Investors & Media" portion of our website free of charge as soon as reasonably practicable after we electronically file such material with, or furnish it to, the SEC. Information on our website is not part of this Annual Report on Form 10-K or any of our other securities filings unless specifically incorporated herein or therein by reference. In addition, our filings with the SEC may be accessed through the SEC's website at http://www.sec.gov. All statements made in any of our securities filings, including all forward-looking statements or information, are made as of the date of the document in which the statement is included, and we do not assume or undertake any obligation to update any of those statements or documents unless we are required to do so by law.

Item 1A. Risk Factors.

RISK FACTORS

Our business involves significant risks, some of which are described below. You should carefully consider the risks described below, as well as the other information in this Annual Report on Form 10-K, including "Management's Discussion and Analysis of Financial Condition and Results of Operations" and the consolidated financial statements and the related notes. The occurrence of any of the events or developments described below could harm our business, financial condition, results of operations and growth prospects. In such an event, the market price of our common stock could decline and you may lose all or part of your investment. Additional risks and uncertainties not presently known to us or that we currently deem immaterial also may impair our business operations. This Annual Report on Form 10-K also contains forward-looking statements that involve risks and uncertainties. Our actual results could differ materially from those anticipated in the forward-looking statements as a result of factors that are described below and elsewhere in this Annual Report on Form 10-K.

Risks Related to Our Financial Position and Capital Needs

We are in the clinical or preclinical stages of vaccine development and have a very limited operating history and no products approved for commercial sale, which may make it difficult for you to evaluate the success of our business to date and to assess our future viability.

To date, we have devoted substantially all of our resources to performing research and development, undertaking preclinical studies, advancing our vaccine candidates through clinical trials, enabling manufacturing activities in support of our product development efforts, acquiring and developing our technology and vaccine candidates, organizing and staffing our company, performing business planning, establishing our intellectual property portfolio and raising capital to support and expand such activities. As an organization, we have not yet demonstrated an ability to successfully complete clinical development, obtain regulatory approvals, manufacture a commercial-scale product or conduct sales and marketing activities necessary for successful commercialization or arrange for a third party to conduct these activities on our behalf. Consequently, any predictions about our future success or viability may not be as accurate as they could be if we had a longer operating history.

Our current vaccine candidate pipeline includes three preclinical programs and two clinical programs. We may encounter unforeseen expenses, difficulties, complications, delays and other known or unknown factors in achieving our business objectives, including with respect to our vaccine candidates. We will need to transition at some point from a company with a research and development focus to a company capable of supporting commercial activities. We may not be successful in such a transition.

We have incurred significant net losses since inception and anticipate that we will continue to incur substantial net losses for the foreseeable future. We currently have no source of product revenue and may never achieve profitability. Our stock is a highly speculative investment.

We are a clinical-stage biotechnology vaccine company. Investment in clinical-stage companies and vaccine development is highly speculative because it entails substantial upfront capital expenditures and significant risk that any potential vaccine candidate will not gain regulatory approval or become commercially viable. We do not have any products approved for sale and have not generated any revenue from product sales. As a result, we are not profitable and have incurred losses in each year since inception. Our net losses were $402.3 million and $223.5 million for the years ended December 31, 2023 and 2022, respectively. As of December 31, 2023, we had an accumulated deficit of $924.4 million.

We expect to continue to spend significant resources to fund research and development of, and seek regulatory approvals for, our vaccine candidates. We expect to incur substantial and increasing operating losses over the next several years as our research, development, manufacturing, preclinical testing and clinical trial activities increase. As a result, our accumulated deficit will also increase significantly. We may encounter unforeseen expenses, difficulties, complications, delays and other unknown factors that may adversely affect our business. The size of our future net losses will depend, in part, on the rate of future growth of our expenses and our ability to

generate revenue. However, we do not expect to generate any revenue from commercial product sales unless and until we successfully complete development and obtain regulatory approval for one or more of our vaccine candidates, which we expect will take a number of years. Our prior losses and expected future losses have had and will continue to have an adverse effect on our stockholders' equity and working capital. Even if we eventually generate revenue, we may never be profitable and, if we do achieve profitability, we may not be able to sustain or increase profitability on a quarterly or annual basis.

We will require substantial additional funding to finance our operations, which may not be available to us on acceptable terms, or at all. If we are unable to raise additional capital when needed, we could be forced to delay, reduce or terminate certain of our development programs or other operations.

As of December 31, 2023, we had cash, cash equivalents and investments of $1,242.9 million. We believe our existing cash, cash equivalents and investments will fund our current operating plans through at least 12 months from the filing date of this Annual Report on Form 10-K. However, our operating plan may change as a result of many factors currently unknown to us, and we may need to seek additional funds sooner than planned. Furthermore, we will need to raise substantial additional capital to complete the development, manufacturing and commercialization of our drug candidates. We expect to finance our cash needs through public or private equity or debt financings, third-party (including government) funding and marketing and distribution arrangements, as well as other collaborations, strategic alliances and licensing arrangements or any combination of these approaches.

In July 2021, we entered into an Open Market Sales Agreement[SM] (the "Original ATM Sales Agreement") with Jefferies LLC ("Jefferies"), which provided that, upon the terms and subject to the conditions and limitations set forth in the Original ATM Sales Agreement, we may elect to issue and sell, from time to time, shares of our common stock having an aggregate offering price of up to $150.0 million through Jefferies acting as our sales agent or principal. As of February 27, 2023, we had sold 4,995,709 shares of our common stock under the Original ATM Sales Agreement at an average price of $27.57 per share for aggregate gross proceeds of $137.8 million. On February 27, 2023, we and Jefferies entered into an amendment to the Original ATM Sales Agreement (as amended, the "Amended ATM Sales Agreement") pursuant to which we may offer and sell shares of our common stock having an aggregate offering price of up to $400.0 million, which is in addition to the $150.0 million aggregate offering price under the Original ATM Sales Agreement. The material terms and conditions of the Original ATM Sales Agreement otherwise remain unchanged. As of December 31, 2023, we have sold 1,588,807 shares of our common stock under the Amended ATM Sales Agreement at an average price of $44.06 per share for aggregate gross proceeds of $70.0 million ($68.6 million net of commissions and offering expenses).

Our ability to raise additional capital may be adversely impacted by potential worsening global economic conditions, including higher inflation rates and changes in interest rates and the recent disruptions to and volatility in the credit and financial markets in the United States and worldwide, including the trading price of common stock, resulting from civil and political unrest in certain countries and regions. Our future capital requirements will depend on many factors, including:

- the timing, scope, progress, results and costs of research and development, testing, screening, manufacturing, preclinical development and clinical trials;
- the costs of future commercialization activities, including product manufacturing, marketing, sales, royalties and distribution, for any of our vaccine candidates for which we receive marketing approval;
- the outcome, timing and cost of seeking and obtaining regulatory approvals from the U.S. Food and Drug Administration ("FDA") and comparable foreign regulatory authorities, including the potential for such authorities to require that we perform field efficacy studies for our pneumococcal conjugate vaccine ("PCV") candidates, require more studies than those that we currently expect or change their requirements regarding the data required to support a marketing application;
- the costs of establishing additional manufacturing capacity to meet potential incremental supply requirements following the initial commercial launch of VAX-24 or VAX-31;
- the costs of building a sales force in anticipation of any product commercialization;

- our ability to maintain existing, and establish new, strategic collaborations, licensing or other arrangements and the financial terms of any such agreements, including the timing and amount of any future milestone, royalty or other payments due under any such agreement;
- any product liability or other lawsuits related to our products;
- the revenue, if any, received from commercial sales, or sales to foreign governments, of our vaccine candidates for which we may receive marketing approval;
- the costs to establish, maintain, expand, enforce and defend the scope of our intellectual property portfolio, including the amount and timing of any payments we may be required to make, or that we may receive, in connection with licensing, preparing, filing, prosecuting, defending and enforcing our patents or other intellectual property rights;
- expenses needed to attract, hire and retain skilled personnel; and
- macroeconomic factors that may exacerbate the magnitude of the factors discussed above.

Our ability to raise additional funds will depend on financial, economic and other factors, many of which are beyond our control. We cannot be certain that additional funding will be available on acceptable terms, or at all. We have no committed source of additional capital and if we are unable to raise additional capital in sufficient amounts or on terms acceptable to us, we may have to significantly delay, scale back or discontinue the development or commercialization of our vaccine candidates or other research and development initiatives. Our license agreements may also be terminated if we are unable to meet the payment obligations or milestones under the agreements. We could be required to seek collaborators for our vaccine candidates at an earlier stage than otherwise would be desirable or on terms that are less favorable than might otherwise be available, or relinquish or license on unfavorable terms our rights to our vaccine candidates in markets where we otherwise would seek to pursue development or commercialization ourselves.

Due to the significant resources required for the development of our vaccine candidates, and depending on our ability to access capital, we must prioritize development of certain vaccine candidates. Moreover, we may expend our limited resources on vaccine candidates that do not yield a successful vaccine and fail to capitalize on vaccine candidates that may be more profitable or for which there is a greater likelihood of success.

Due to the significant resources required for the development of our vaccine candidates, we must decide which vaccine candidates to pursue and advance and the amount of resources to allocate to each. Our decisions concerning the allocation of research, development, management and financial resources toward particular vaccine candidates may not lead to the development of any viable commercial vaccines and may divert resources away from better opportunities. Similarly, our potential decisions to delay, terminate, license or collaborate with third parties in respect of certain vaccine candidates may subsequently also prove to be less than optimal and could cause us to miss valuable opportunities. If we make incorrect determinations regarding the viability or market potential of any of our vaccine candidates or misread trends in the biopharmaceutical industry, in particular for vaccines, our business could be seriously harmed. As a result, we may fail to capitalize on viable commercial products or profitable market opportunities, be required to forego or delay pursuit of opportunities with other vaccine candidates that may later prove to have greater commercial potential than those we choose to pursue or relinquish valuable rights to such vaccine candidates through collaboration, licensing or other royalty arrangements in cases in which it would have been advantageous for us to invest additional resources to retain sole development, manufacturing and commercialization rights.

Risks Related to Our Business and Industry

Our approach to the discovery and development of our vaccine candidates is based on novel technologies that are unproven, which may expose us to unforeseen risks, require us to modify processes, and make it difficult to predict the time and cost of vaccine candidate development and the timing to apply for and obtain regulatory approvals.

We are developing a pipeline of vaccine candidates utilizing our cell-free protein synthesis platform, which is comprised of the XpressCF platform exclusively licensed from Sutro Biopharma, Inc. (“Sutro Biopharma”) and our proprietary know-how for vaccine applications against infectious disease, and our future success depends on

the successful application of this approach to vaccine development. We are in the clinical or preclinical stages of developing our vaccine candidates and there can be no assurance that any development problems we experience in the future will not cause significant delays or unanticipated costs, or that such development problems can be overcome. For example, although we have achieved proof-of-concept for our carrier-sparing approach with VAX-24, our approach may not be validated for our other vaccine candidates or subsequent trials of VAX-24. We may also experience delays in developing a sustainable, reproducible and scalable manufacturing process or transferring that process to manufacturing partners, which may prevent us from completing our clinical trials or commercializing our products on a timely or profitable basis, if at all. In addition, since we have not yet completed clinical development, we do not know the specific doses that may be effective in the clinic or, if approved, commercially. Finding a suitable dose may delay our anticipated clinical development timelines.

Furthermore, our expectations with regard to our scalability and costs of manufacturing may vary significantly as we develop our vaccine candidates and understand these critical factors. Conjugate vaccine development is highly complex, and development of broad-valency PCVs is further complicated by the number of components, analytical assays and potential for adjustments, including but not limited to changes in raw materials, composition, formulation, manufacturing methods and dosing, which could result in drug substances and/or drug product that may vary between preclinical and clinical studies over time. Over the course of the development and manufacturing of VAX-24, we have encountered process-related matters that have required us to make adjustments to our processes. We encountered such process-related matters during our drug substance manufacturing campaign for VAX-24 at Lonza, Ltd. (“Lonza”). The cumulative impact of the time required to make adjustments to our processes led to a delay of our drug substance manufacturing campaign due to scheduling conflicts and capacity constraints at Lonza. There can be no assurance that we or Lonza will be able to successfully manufacture drug substances in a timely manner in the future, or at all. Such process changes and manufacturing delays have caused a change in our Investigational New Drug (“IND”) application timelines in the past and future changes or delays could impact future timelines for VAX-24, VAX-31 or for our other product candidates.

In addition, the preclinical and clinical trial requirements of the FDA, European Medicines Agency (“EMA”) and other regulatory agencies and the criteria these regulators use to determine the safety and efficacy of a vaccine candidate are determined according to the type, complexity, novelty and intended use and market of the potential products. Approvals by the FDA and EMA for existing pneumococcal vaccines, such as Pfizer Inc.'s (“Pfizer's”) Prevnar 13 (“PCV13”), Prevnar 20 (“PCV20”) and Merck & Co., Inc.'s (“Merck”) VAXNEUVANCE™ (“PCV15”) and Pneumovax 23 (“PPSV23”), may not be indicative of what these regulators may require for approval of our vaccine candidates. For example, the FDA may challenge our VAX-24 Phase 3 chemistry, manufacturing and controls (“CMC”) strategy, which could cause significant delays or unanticipated costs. Additionally, novel aspects of our vaccine candidates and manufacturing processes may create further challenges in obtaining regulatory approval. The regulatory approval process for our novel vaccine candidates can be more complex and consequently more expensive and take longer than for other, better known or extensively studied pharmaceutical or other vaccine candidates. More generally, approvals by any regulatory agency may not be indicative of what any other regulatory agency may require for approval or what such regulatory agencies may require for approval in connection with new vaccine candidates. Moreover, our vaccine candidates may not perform successfully in clinical trials.

Our vaccine candidates are in clinical or preclinical stages of development and may fail in development or suffer delays that materially and adversely affect their commercial viability. If we are unable to complete development of or commercialize our vaccine candidates or experience significant delays in doing so, our business would be materially harmed.

None of our vaccine candidates have been the subject of late-stage or pivotal clinical trials. On October 24, 2022, we announced positive topline results from our Phase 1/2 clinical proof-of-concept study of VAX-24 in adults ages 18 to 64. On April 17, 2023, we announced positive results from the VAX-24 Phase 2 study in adults aged 65 and older, as well as data from the full six-month safety assessment and prespecified pooled immunogenicity analyses from both the Phase 2 study in adults aged 65 and older and the prior Phase 1/2 study in adults aged 18-64. Our VAX-24 adult regulatory strategy includes several interactions with the FDA to finalize our Phase 3 clinical program and Biologics License Application (“BLA”) submission requirements. In October 2023, we completed a successful End-of-Phase 2 meeting with the FDA. The meeting focused on the VAX-24 adult Phase 3 clinical program, including the design of the pivotal, non-inferiority study and other Phase 3 studies needed to support a BLA submission. Based on the End-of-Phase 2 meeting we believe there is agreement with the FDA on

the clinical design of the potential adult Phase 3 program, including the approximate overall number of subjects, the primary and secondary endpoints for the pivotal, non-inferiority study as well as confirmation that the planned immunogenicity analyses are sufficient to support licensure and an efficacy study is therefore not required. In January 2024, we announced that we received encouraging input from ongoing discussions with the FDA about the VAX-24 adult program to further inform our CMC licensure requirements and that we expect to seek additional CMC-focused input from the FDA as we prepare for and potentially conduct our VAX-24 adult Phase 3 program. Even with FDA guidance, we still may be unable to successfully complete development to the FDA's satisfaction, and any delay or inability to obtain commercial approval would materially harm our business.

In October 2023, we announced that the FDA cleared our adult IND application for VAX-31, a 31-valent PCV candidate designed to prevent IPD. We initiated the VAX-31 Phase 1/2 clinical study in adults in the November 2023 and in January 2024, we announced the completion of enrollment in the Phase 1/2 clinical study evaluating VAX-31 in healthy adults aged 50 and older. We expect to announce topline safety, tolerability and immunogenicity results in the third quarter of 2024.

In addition to our PCV franchise, our pipeline includes VAX-A1, a novel conjugate vaccine candidate designed to prevent disease caused by Group A Streptococcus, Group A Strep; VAX-PG, a novel protein vaccine candidate targeting the keystone pathogen responsible for periodontitis; VAX-GI, novel preclinical vaccine candidate being developed as a preventative treatment for dysentery and shigellosis, which is caused by Shigella bacteria; and other discovery-stage programs.

Our ability to achieve and sustain profitability depends on obtaining regulatory approvals for and successfully commercializing our vaccine candidates, either alone or with third parties, and we cannot guarantee that we will ever obtain regulatory approval for any of our vaccine candidates. We have limited experience in conducting and managing the clinical trials necessary to obtain regulatory approvals, including approval by the FDA. Before obtaining regulatory approval for the commercial distribution of our vaccine candidates, we must conduct extensive preclinical studies and clinical trials to demonstrate the safety and efficacy of our vaccine candidates.

We may not have the financial resources to continue development of, or to enter into new collaborations for, a vaccine candidate if we experience any issues that delay or prevent regulatory approval of, or our ability to commercialize, vaccine candidates, including:

- negative or inconclusive results from our preclinical or clinical trials, leading to a decision or requirement to conduct additional preclinical studies or clinical trials or abandon a program;
- product-related adverse effects experienced by volunteers in our clinical trials;
- difficulty achieving successful development of our manufacturing processes, including process development and scale-up activities to supply products for preclinical studies, clinical trials and commercial sale, if approved;
- timely completion of our preclinical studies and clinical trials, including any field efficacy studies that may be required, which may be significantly slower or cost more than we currently anticipate and will depend substantially upon the performance of third-party contractors;
- inability of us or any third-party contract manufacturer to scale up manufacturing of our vaccine candidates to supply the needs of preclinical studies, clinical trials and commercial sales, and to manufacture such products in conformity with regulatory requirements;
- delays in submitting IND applications or compatible foreign applications or delays or failures in obtaining necessary approvals from regulators to commence a clinical trial, or suspension or termination of a clinical trial once commenced;
- conditions imposed by the FDA or similar foreign authorities regarding the scope or design of our clinical trials, including any requirements to perform field efficacy studies;
- challenges by the FDA to our clinical or regulatory strategies;
- delays in enrolling subjects in our clinical trials;

- inadequate supply or quality of vaccine candidate components or materials or other supplies necessary for conducting clinical trials;
- inability to obtain alternative sources of supply for which we have a single source for vaccine candidate components;
- the availability of coverage and adequate reimbursement and pricing from third-party payors, including government authorities, pertaining to the vaccine candidate, once approved, and patients' willingness to pay out-of-pocket if third-party payor reimbursement is limited or not available;
- greater than anticipated costs of our clinical trials, including CMC activities related to our clinical trials;
- harmful side effects or inability of our vaccine candidates to meet efficacy endpoints;
- unfavorable FDA or other regulatory agency inspection and review of one or more of our clinical trial sites or our contract manufacturers' facilities;
- failure of our third-party contractors or investigators to comply with regulatory requirements or otherwise meet their obligations in a timely manner, or at all;
- delays and changes in regulatory requirements, policy and guidelines, including the imposition of additional regulatory oversight around clinical testing generally or with respect to our technology or vaccine candidates in particular; or
- varying interpretations of our data by the FDA and comparable foreign regulatory authorities.

In particular, while we believe our PCVs could receive regulatory approval based on well-defined surrogate immune endpoints, consistent with how other PCVs have obtained regulatory approval in the past, rather than requiring clinical field efficacy studies, there can be no assurance that the FDA or comparable foreign regulatory authorities will provide approvals on such basis. In addition, changes to the standard-of-care or the approval of new vaccines could change the threshold for achievement of non-inferiority using the established surrogate immune endpoints that our PCVs will need to meet in our clinical trials.

Our inability to complete development of or commercialize our vaccine candidates, or significant delays in doing so due to one or more of these factors, could have a material and adverse effect on our business, financial condition, results of operations and prospects.

Moreover, principal investigators for our clinical trials may serve as scientific advisors or consultants to us from time to time and receive compensation in connection with such services. Under certain circumstances, we may be required to report some of these relationships to the FDA or comparable foreign regulatory authorities. The FDA or comparable foreign regulatory authorities may conclude that a financial relationship between us and a principal investigator has created a conflict of interest or otherwise affected interpretation of the study. The FDA or comparable foreign regulatory authorities may therefore question the integrity of the data generated at the applicable clinical trial site and the utility of the clinical trial itself may be jeopardized. This could result in a delay in approval, or rejection, of our marketing applications by the FDA or comparable foreign regulatory authorities, as the case may be, and may ultimately lead to the denial of marketing approval of one or more of our vaccine candidates.

Our business is highly dependent on the success of our PCV candidates, VAX-24 and VAX-31, both of which are in clinical development. If we are unable to successfully develop, obtain approval for and effectively commercialize VAX-24 or VAX-31, our business would be significantly harmed.

Our business and future success depends on our ability to successfully develop, obtain regulatory approval of, and then commercialize our PCV candidates, which include VAX-24, our most advanced vaccine candidate, and VAX-31, our 31-valent clinical PCV candidate. Although VAX-24 has produced positive topline results in clinical studies, it may not demonstrate the same results in future pivotal studies. Past and future VAX-24 results may not be indicative of future VAX-31 results. VAX-24 and VAX-31 will require additional preclinical, clinical and non-clinical development, regulatory review and approval in multiple jurisdictions, substantial investment, access to sufficient clinical and commercial manufacturing capacity and significant marketing efforts

before we can generate any revenue from product sales. We cannot provide any assurance that we will be able to successfully advance VAX-24 or VAX-31 through the development process.

The clinical and commercial success of VAX-24, VAX-31 and future vaccine candidates will depend on a number of factors, including the following:

- our ability to raise any additional required capital on acceptable terms, or at all;
- our ability to complete IND-enabling studies and successfully submit IND or comparable applications;
- the ability of third parties with whom we contract to manufacture adequate clinical study and commercial supplies of our lead vaccine candidates or any future vaccine candidates, remain in good standing with regulatory agencies and develop, validate and maintain commercially viable manufacturing processes that are compliant with current good manufacturing practices ("cGMP") and do so in a timely manner;
- timely completion of our preclinical studies and clinical trials, which may be significantly slower or cost more than we currently anticipate and will depend substantially upon the performance of third-party contractors;
- whether we are required by the FDA or similar foreign regulatory agencies to conduct additional clinical trials, including field efficacy studies, or other studies beyond those planned to support the approval and commercialization of our vaccine candidates or any future vaccine candidates;
- acceptance of our proposed indications and primary surrogate endpoint assessments for our PCV candidates by the FDA and similar foreign regulatory authorities;
- any changes to the required threshold for the achievement of non-inferiority using established surrogate immune endpoints that our PCVs will need to meet in our clinical trials;
- our ability to demonstrate to the satisfaction of the FDA or comparable foreign regulatory authorities the safety, efficacy and acceptable risk to benefit profile of VAX-24, VAX-31 or any future vaccine candidates;
- the pace and prevalence of serotype replacement following the introduction of VAX-24 or VAX-31 or other vaccines targeting pneumococcal disease;
- any vaccine-vaccine interference studies that may be required, particularly with the standard-of-care pediatric vaccine regimen;
- the prevalence, duration and severity of potential side effects or other safety issues experienced with our vaccine candidates or future approved products, if any;
- the timely receipt of necessary marketing approvals from the FDA or comparable foreign regulatory authorities;
- achieving, maintaining and, where applicable, ensuring that our third-party contractors achieve and maintain compliance with our contractual obligations and with all regulatory requirements applicable to our lead vaccine candidates or any future vaccine candidates or approved products, if any;
- obtaining and maintaining an Advisory Committee on Immunization Practices ("ACIP") preferred recommendation or comparable foreign regulatory authority's recommendation of our vaccine candidates and the willingness of physicians, operators of clinics and patients to utilize or adopt any of our future vaccine candidates to prevent or treat age-associated diseases;
- our ability to successfully develop a commercial strategy and thereafter commercialize our vaccine candidates or any future vaccine candidates in the United States and internationally, if approved for marketing, reimbursement, sale and distribution in such countries and territories, whether alone or in collaboration with others;
- the convenience of our treatment or dosing regimen;

- acceptance by physicians, payors and patients of the benefits, safety and efficacy of our vaccine candidates or any future vaccine candidates, if approved, including relative to alternative and competing treatments;
- patient demand for our vaccine candidates, if approved;
- our ability to establish and enforce intellectual property rights in and to our vaccine candidates or any future vaccine candidates;
- our ability to avoid third-party patent interference, intellectual property challenges or intellectual property infringement claims; and
- macroeconomic factors that may exacerbate the magnitude of the factors discussed above.

These factors, many of which are beyond our control, could cause us to experience significant delays or an inability to obtain regulatory approvals or commercialize our vaccine candidates. Even if regulatory approvals are obtained, we may never be able to successfully commercialize any of our vaccine candidates. Accordingly, we cannot provide assurances that we will be able to generate sufficient revenue through the sale of our vaccine candidates or any future vaccine candidates to continue our business or achieve profitability.

Our primary competitors have significantly greater resources and experience than we do, which may make it difficult for us to successfully develop and commercialize our vaccine candidates, or may result in others discovering, developing or commercializing products before or more successfully than us.

The vaccine market is intensely competitive and is dominated by a small number of multinational, globally established pharmaceutical corporations with significant resources; in recent history, Pfizer, Merck, GSK plc ("GSK") and Sanofi have been responsible for developing and introducing most new vaccines to the world. We may also face competition from many different sources, including pharmaceutical and biotechnology companies, academic institutions, governmental agencies and public and private research institutions.

Vaccine candidates that we successfully develop and commercialize may compete with existing vaccines and new vaccines that may become available in the future. Many of our competitors have substantially greater financial, lobbying, technical, human and other resources than we do and may be better equipped to develop, manufacture and market technologically superior vaccines, including the potential that our competitors may develop chemical processes or utilize novel technologies for developing vaccines that may be superior to those we employ. In addition, many of these competitors have significantly greater experience than we have in undertaking preclinical studies and clinical trials of new products and in obtaining regulatory approvals, including for many vaccine franchises. Accordingly, our competitors may succeed in obtaining FDA approval or a preferred recommendation from ACIP for their products. For example, PCV13 obtained FDA approval for the prevention of invasive pneumococcal disease ("IPD") in infants based on non-inferior IgG antibody responses relative to Prevnar, using the surrogate immune endpoints established by the prior Prevnar field efficacy study. Pfizer implemented a similar approach to development of its 20-valent PCV vaccine candidate, PCV20, which was approved by the FDA in June 2021 for use in adults and in April 2023 for use in infants and children. Merck received approval for PCV15, its 15-valent PCV, in July 2021 for use in adults and in June 2022 for use in infants and children. Merck announced in April 2022 that V116, Merck's investigational 21-valent PCV for adults, received Breakthrough Therapy designation from the FDA. In July 2023, Merck announced positive topline results from two Phase 3 trials evaluating V116, in vaccine-naïve and previously vaccinated individuals. In November 2023, Merck presented positive results from a Phase 3 study evaluating V116 in pneumococcal vaccine-naïve adults. Merck reported that V116 elicited non-inferior immune responses compared to PCV20 for the common 10 serotypes and superior responses for 10 of the 11 unique serotypes and that safety and tolerability endpoints were met. In December 2023, Merck also announced that based on these Phase 3 results, the FDA accepted for priority review a new BLA for V116 and set a Prescription Drug User Fee Act ("PDUFA"), or target action date, of June 17, 2024. In addition, Sanofi and SK Chemicals have partnered to develop a 21-valent PCV and, in June 2023, announced positive results from their Phase 2 clinical trials in infants. GSK, which previously acquired Affinivax, is developing a 24-valent affinity-bound pneumococcal vaccine. GSK also has a 30-plus valent pneumococcal candidate vaccine in preclinical development.

Many of our competitors have established distribution channels for the commercialization of their vaccine products, whereas we have no such established channels or capabilities. In addition, many competitors have greater name recognition, more extensive collaborative relationships or the ability to leverage a broader vaccine portfolio. Our commercial opportunity could be reduced or eliminated if our competitors develop and commercialize vaccines that are safer, more effective, more convenient, less expensive or with a more favorable label than any vaccine candidates that we may develop.

As a result of these factors, our competitors may obtain regulatory approval of their products before we are able to, which may limit our ability to develop or commercialize our vaccine candidates, or achieve a competitive position in the market. This would adversely affect our ability to generate revenue. Our competitors may also develop vaccines that are safer, more effective, more widely accepted or less expensive than ours, and may also be more successful than we are in manufacturing and marketing their products. These advantages could render our vaccine candidates obsolete or non-competitive before we can recover the costs of such vaccine candidates' development, manufacturing and commercialization.

Mergers and acquisitions in the pharmaceutical and biotechnology industries may result in even more resources being concentrated among a smaller number of our competitors. Smaller and early-stage companies may also prove to be significant competitors, particularly through collaborative arrangements with large and established companies. These third parties compete with us in recruiting and retaining qualified scientific, management and commercial personnel, establishing clinical trial sites and subject enrollment for clinical trials, as well as in acquiring technologies complementary to, or necessary for, our programs.

We and our contract manufacturers may face difficulty satisfying CMC requirements imposed by the FDA and comparable foreign regulatory authorities. To date, no product developed using a cell-free manufacturing platform has received approval from the FDA or been commercialized.

While we are designing and developing a manufacturing process that we believe can scale to address clinical and commercial vaccine supply, we do not own or operate any manufacturing facilities. We rely on contract manufacturing organizations ("CMOs"), including our strategic partnership with our contract manufacturer, Lonza, to access resources to facilitate the development and, if approved, commercialization of VAX-24 or VAX-31 and our other vaccine candidates. Advancing our vaccine candidates may create significant challenges, including:

- manufacturing our vaccine candidates to our specifications, including process development, analytical development and quality control testing, and in a timely manner to support our preclinical and clinical trials and, if approved, commercialization;
- sourcing the raw materials used to manufacture our vaccine candidates for preclinical, clinical and, if approved, commercial supplies; and
- establishing sales and marketing capabilities upon obtaining any regulatory approval to gain market acceptance of our vaccines.

Before we can initiate a clinical trial or commercialize any of our vaccine candidates, we must demonstrate to the FDA that the CMC for our vaccine candidates meet applicable requirements, and prior to authorization in the European Union ("EU"), a manufacturing authorization must be obtained from the appropriate EU regulatory authorities. Because no product manufactured on a cell-free manufacturing platform has been approved in the United States, there is no manufacturing facility that has demonstrated the ability to comply with FDA requirements, and, therefore, the timeframe for demonstrating compliance to the FDA's satisfaction is uncertain. In January 2024, we announced that we received encouraging input from ongoing discussions with the FDA about the VAX-24 adult program to further inform our CMC licensure requirements and that we expect to seek additional CMC-focused input from the FDA as we prepare for and potentially conduct our VAX-24 adult Phase 3 program. Delays in establishing that our manufacturing process and the facilities we utilize for manufacturing comply with cGMP or disruptions in our manufacturing processes, implementation of novel technologies or scale-up activities, may delay or disrupt our development efforts.

Even if we obtain regulatory approval of our vaccine candidates, the products may not gain market acceptance among regulators, advisory boards, physicians, patients, third-party payors and others in the medical community necessary for commercial success.

Even if any of our vaccine candidates receive marketing approval, they may fail to receive recommendations for use by regulators or advisory boards that recommend vaccines, or gain market acceptance by physicians, patients, third-party payors and others in the medical community. If such vaccine candidates do not achieve an adequate level of acceptance, we may not generate significant product revenue and may not become profitable. The degree of market acceptance of any vaccine candidate, if approved for commercial sale, will depend on a number of factors, including but not limited to:

- receiving Centers for Disease Control and Prevention ("CDC") and ACIP recommendations for use, as well as recommendations of comparable foreign regulatory and advisory bodies;
- prevalence and severity of the disease targets for which our vaccine candidates are approved;
- physicians, hospitals, third-party payors and patients considering our vaccine candidates as safe and effective;
- the potential and perceived advantages of our vaccine candidates over existing vaccines, including with respect to spectrum of coverage or immunogenicity;
- the prevalence and severity of any side effects;
- product labeling or product insert requirements of the FDA or comparable foreign regulatory and advisory bodies;
- limitations or warnings contained in the labeling approved by the FDA or comparable foreign regulatory and advisory bodies;
- the timing of market introduction of our vaccine candidates as well as competitive products;
- the cost in relation to alternatives;
- the availability of coverage and adequate reimbursement and pricing by third-party payors, including government authorities;
- the willingness of patients to pay out-of-pocket in the absence of coverage and adequate reimbursement by third-party payors, including government authorities;
- relative convenience and ease of administration, including as compared to competitive vaccines and alternative treatments; and
- the effectiveness of our sales and marketing efforts.

In the United States, the CDC and ACIP develop vaccine recommendations for both children and adults, as do similar agencies around the world. To develop its recommendations, ACIP forms working groups that gather, analyze and prepare scientific information. The ACIP also considers many of the factors above, as well as myriad additional factors such as the value of vaccination for the target population regarding the outcomes, health economic data and implementation issues. ACIP recommendations are also made within categories, such as in an age group or a specified risk group. For example, the ACIP may determine that a preferred recommendation in a smaller child population may be more economical than recommending vaccinations for a larger adult population, which could adversely impact our market opportunity.

New pediatric vaccines that receive an ACIP preferred recommendation are almost universally adopted, and adult vaccines that receive a preferred recommendation are widely adopted. For example, in 2014, the ACIP voted to recommend PCV13 for routine use to help protect adults aged 65 years and older against pneumococcal disease, which caused PCV13 to become the standard-of-care along with continued use of PPSV23. ACIP can also modify its preferred recommendation. For instance, in June 2019, the ACIP voted to revise the pneumococcal vaccination guidelines and recommend PCV13 for adults 65 and older based on the shared clinical decision making of the provider and patient, rather than a preferred use recommendation, which means the decision to vaccinate

should be made at the individual level between health care providers and their patients. In October 2021, the ACIP voted to recommend the use of either PCV20, or PCV15 with PPSV23, for routine use in adults aged 65 years and older as well as for those between the ages of 19 and 64 years with certain underlying medical conditions or other risk factors. In June 2022, ACIP voted to recommend that PCV15 may be used as an option to the currently available PCV13 for children aged under 19 years according to currently recommended PCV13 dosing and schedules. In June 2023, ACIP voted to recommend the use of either PCV15 or PCV20 for routine use in children under the age of two, and as a "catch up" vaccination for healthy children between the ages of 24 and 59 months with incomplete PCV vaccination status and children between the ages of 24 and 71 months with certain underlying conditions and an incomplete PCV vaccination. Further, ACIP voted to recommend that children between the ages of two and 18 years with any risk condition who have received all recommended doses before the age of six do not need additional doses if they have received at least one dose of PCV20. If children between the ages of two and 18 years with any risk condition received PCV13 or PCV15, but not PCV20, ACIP recommend that they should receive a dose of PCV20 or PPSV23. ACIP also voted to recommend that children between the ages of six and 18 years with any risk condition who have not received any dose of PCV13, PCV15 or PCV20 should receive a single dose of PCV15 or PCV20. When PCV15 is used in this instance, ACIP recommended that it should be followed by a dose of PPSV23 at least eight weeks later if not previously given.

If our vaccine candidates are approved but fail to receive CDC and ACIP recommendations, or recommendations of other comparable foreign regulatory and advisory bodies, or achieve market acceptance among physicians, healthcare providers, patients, third-party payors or others in the medical community, we will not be able to generate significant revenue. Even if our products achieve market acceptance, we may not be able to maintain that market acceptance over time if new products or technologies are introduced that are more favorably received than our products, are more cost effective or render our products obsolete.

We may not be successful in our efforts to use our cell-free protein synthesis platform to expand our pipeline of vaccine candidates and develop marketable products.

The success of our business depends in large part upon our ability to identify, develop and commercialize products based on our cell-free protein synthesis platform. We intend to pursue clinical development of additional vaccine candidates beyond VAX-24 and, VAX-31 for IPD, including VAX-A1 for Group A Strep, VAX-PG for periodontitis and VAX-GI for dysentery and shigellosis. Our research programs may fail to identify potential vaccine candidates for clinical development for a number of reasons or we may focus our efforts and resources on potential programs or vaccine candidates that ultimately prove to be unsuccessful. In addition, we cannot provide any assurance that we will be able to successfully advance any of our existing or future vaccine candidates through the development process.

Our potential vaccine candidates may be shown to have harmful side effects or may have other characteristics that may make the products unmarketable or unlikely to receive marketing approval. If any of these events occur, we may be forced to abandon our development efforts for a program or for multiple programs, which would materially harm our business and could potentially cause us to cease operations.

Even if we receive FDA approval to market additional vaccine candidates, we cannot provide assurance that any such vaccine candidates will be successfully commercialized, widely accepted in the marketplace or more effective than other commercially available alternatives. In addition, current PCVs do not address the majority of circulating strains causing pneumococcal disease. There has been a decrease in the incidence of disease attributable to the strains covered by existing vaccines but an increase in incidence attributable to non-covered strains that now cause most residual disease. Such change is driven by the void created when strains are taken out of circulation after widespread vaccination, which is a phenomenon known as serotype replacement. As a result of such change, broader spectrum PCVs are required to maintain protection against historically pathogenic strains while expanding coverage to current circulating and emerging strains. There can be no assurance that we will be able to develop higher-valent vaccines to address serotype replacement.

In addition, because VAX-24 is our most advanced vaccine candidate, and because our other vaccine candidates are also based on our cell-free protein synthesis platform, if VAX-24 encounters safety or efficacy problems, manufacturing problems, developmental delays, regulatory issues or other problems, our development plans and business would be significantly harmed.

We currently rely on third-party manufacturing and supply partners, including Lonza and Sutro Biopharma, to supply raw materials and components for, and the manufacture of, our preclinical and clinical supplies as well as our vaccine candidates. Our inability to procure necessary raw materials or to have sufficient quantities of preclinical and clinical supplies or the inability to have our vaccine candidates manufactured, including delays or interruptions at our third-party manufacturers, or our failure to comply with applicable regulatory requirements or to supply sufficient quantities at acceptable quality levels or prices, or at all, would materially and adversely affect our business.

Efficient and scalable manufacturing and supply is a vital component of our business strategy. We do not own or operate any manufacturing facilities. We are designing and developing a manufacturing process that we believe can scale to address clinical and commercial vaccine supply. However, our assumptions as to our ability and our CMOs' ability to produce vaccines at the scale needed for clinical development, manufacturing and commercial demand, in particular for our PCVs, may prove to be wrong. If we encounter substantial problems in our manufacturing processes or in our ability to scale to address commercial vaccine supply, our business would be materially adversely affected. Examples of potential issues related to our manufacturing processes or our ability to scale include difficulties with production costs, yields and quality control, including stability of the drug substance or drug product.

We rely on third-party contract manufacturers to manufacture preclinical and clinical trial product materials and supplies for our needs. There can be no assurance that our preclinical and clinical development product supplies will not be limited or interrupted or be of satisfactory quality or continue to be available on acceptable terms. Over the course of the development and manufacturing of VAX-24, we have encountered process-related matters that have required us to make adjustments to our processes. We encountered such process-related matters during our drug substance manufacturing campaign for VAX-24 at Lonza. The cumulative impact of the time required to make adjustments to our processes led to a delay of our drug substance manufacturing campaign due to scheduling conflicts and capacity constraints at Lonza. There can be no assurance that we or Lonza will be able to successfully manufacture drug substances in a timely manner in the future, or at all. Such process changes and manufacturing delays have caused a change in our IND timelines in the past and future changes or delays could impact future timelines for VAX-24, VAX-31 or for our other product candidates. Since we utilize a third-party manufacturer, we are also subject to Lonza's scheduling commitments for its other clients. Scheduling conflicts with Lonza's other clients have contributed to manufacturing delays in the past, and there is no guarantee that future scheduling conflicts or related capacity constraints will not affect our manufacturing campaigns and related timelines. Certain aspects of our manufacturing process for our clinical trial product materials and supplies have also been adversely affected by macroeconomic factors, such as the COVID-19 pandemic, and could be adversely affected by earthquakes and other natural or man-made disasters, equipment failures, labor shortages, health epidemics, power failures and numerous other factors in the future.

The manufacturing process for a vaccine candidate is subject to FDA or comparable foreign regulatory authority review. Our suppliers and manufacturers must meet applicable manufacturing requirements and undergo rigorous facility and process validation tests required by regulatory authorities in order to comply with regulatory standards, such as cGMPs.

If our contract manufacturers cannot successfully manufacture material that conforms to our specifications and the strict regulatory requirements of the FDA or comparable foreign regulatory authorities, we may not be able to rely on their manufacturing facilities for the manufacture of elements of our vaccine candidates. Moreover, we do not control the manufacturing process at our contract manufacturers and are completely dependent on them for compliance with current regulatory requirements. In the event that any of our manufacturers fails to comply with such requirements or to perform its obligations in relation to quality, timing or otherwise, or if our supply of components or other materials becomes limited or interrupted for other reasons, we may be forced to manufacture the materials ourselves or enter into an agreement with another third party, which we may not be able to do on reasonable terms, if at all. In some cases, the technical skills, raw materials or technology required to manufacture our vaccine candidates may be unique or proprietary to the original manufacturer or supplier, and we may have difficulty applying such skills or technology or sourcing such raw materials ourselves, or in transferring such skills, technology or raw materials to another third party, or such transfer may be subject to certain consent obligations and payment terms to Lonza. These factors would increase our reliance on such manufacturer or require

us to obtain a license from such manufacturer in order to enable us, or to have another third party, manufacture our vaccine candidates. If we are required to change manufacturers for any reason, we will be required to verify that the new manufacturer maintains facilities and procedures that comply with quality standards and with all applicable regulations and guidelines, and we may be required to repeat some of the development program. The delays associated with the verification of a new manufacturer could negatively affect our ability to develop vaccine candidates in a timely manner or within budget.

We expect to continue to rely on third-party manufacturers and suppliers, including Lonza, if we receive regulatory approval for any PCV or any other vaccine candidates. For example, in October 2023, Vaxcyte Switzerland GmbH ("Vaxcyte GmbH"), a Swiss limited liability company and wholly owned subsidiary of ours, entered into a pre-commercial services and commercial manufacturing supply agreement (the "Commercial Manufacturing and Supply Agreement") with Lonza, pursuant to which Lonza will (i) construct and build out a dedicated suite ("Suite") at Lonza's facilities in Visp, Switzerland to manufacture certain key components (including drug substance) for our proprietary PCV franchise and any other products or intermediates Vaxcyte GmbH may choose (collectively, the "Products"), and (ii) maintain and operate the Suite (utilizing Lonza's employees) to manufacture the Products as a service provided to Vaxcyte GmbH, including conducting related quality control and quality assurance operations. Pursuant to the Commercial Manufacturing and Supply Agreement, Lonza will be a preferred, non-exclusive, supplier of the Products to Vaxcyte GmbH, and Vaxcyte GmbH retains the right to procure the Products from one or more alternate and/or backup manufacturers of the Products (including at our own facilities).

To the extent that we have existing, or enter into future, manufacturing arrangements with third parties, we will depend on these third parties to perform their obligations in a timely manner consistent with contractual and regulatory requirements, including those related to quality control and assurance. In December 2019, we exercised our right to require Sutro Biopharma to establish a second supplier for extract and custom reagents to support our anticipated clinical and commercial needs. In December 2022, we entered into an option agreement with Sutro Biopharma (the "Option Agreement"). Pursuant to the Option Agreement, we acquired from Sutro Biopharma (i) authorization to enter into an agreement with an independent alternate CMO to directly source Sutro Biopharma's cell-free extract, allowing us to have direct oversight over financial and operational aspects of the relationship with the CMO; and (ii) a right, but not an obligation, to obtain certain exclusive rights to internally manufacture and/or source extract from certain CMOs and the right to independently develop and make improvements to extract (including the right to make improvements to the extract manufacturing process as well as cell lines) for use in connection with the exploitation of certain vaccine compositions (the "Option"). We and Sutro Biopharma agreed to negotiate the terms and conditions of a form definitive agreement to be entered into in the event we exercise the Option, which would include the terms and conditions set forth in an executed term sheet between us (the "Term Sheet") and such terms that were necessary to give effect to each of the terms and conditions set forth in the Term Sheet (the "Form Definitive Agreement"). On September 28, 2023, we and Sutro Biopharma mutually agreed in writing upon the Form Definitive Agreement to become effective in the event that we exercise the Option. In November 2023, we exercised the Option and entered into a manufacturing rights agreement (the "Manufacturing Rights Agreement") with Sutro Biopharma to obtain control over the development and manufacture of cell-free extract. Pursuant to the Manufacturing Rights Agreement, we obtained exclusive rights to independently, or through certain third parties, develop, improve and manufacture cell-free extract for use in connection with our vaccine candidates. If Sutro Biopharma, the independent alternate CMO or the designated third parties are unable to provide a sufficient supply of cell-free extract, our third-party manufacturers may be delayed in their production of intermediate components, which may lead to delays of our drug substance manufacturing campaigns.

If we are unable to obtain additional or maintain third-party manufacturing for vaccine candidates, or to do so on commercially reasonable terms, we may not be able to develop and commercialize our vaccine candidates successfully. Our or a third party's failure to execute on our manufacturing requirements and comply with cGMPs could adversely affect our business in a number of ways, including:

- an inability to initiate or complete clinical trials of vaccine candidates under development;
- delay in submitting regulatory applications, or receiving regulatory approvals, for our vaccine candidates;
- subjecting third-party manufacturing facilities to additional inspections by regulatory authorities;

- requirements to cease distribution or to recall batches of our vaccine candidates; and
- in the event of approval to market and commercialize a vaccine candidate, an inability to meet commercial demands for our products.

In addition, because VAX-24, VAX-31 and our other vaccine candidates are also based on our cell-free protein synthesis platform, if our vaccine candidates encounter safety or efficacy problems, manufacturing problems, developmental delays, regulatory issues or other problems, our development plans and business would be significantly harmed.

Additionally, we and our contract manufacturers may experience manufacturing difficulties due to limited vaccine manufacturing experience, resource constraints or as a result of labor disputes or unstable political environments. If we or our contract manufacturers were to encounter any of these difficulties, our ability to manufacture sufficient vaccine supply for our preclinical studies and clinical trials, or to provide product for patients once approved, would be jeopardized.

Our vaccine candidates may cause undesirable side effects or have other properties, including interactions with existing vaccine regimens, that could halt their clinical development, prevent their regulatory approval, limit their commercial potential or result in significant negative consequences.

Adverse effects or other undesirable or unacceptable side effects caused by our vaccine candidates could cause us or regulatory authorities to interrupt, delay or halt clinical trials and could result in a more restrictive label or the delay or denial of regulatory approval by the FDA or other comparable foreign regulatory authorities. Results of our clinical trials could reveal a high and unacceptable severity and prevalence of side effects or unexpected characteristics. In such an event, our clinical trials could be suspended or terminated, and the FDA or comparable foreign regulatory authorities could order us to cease further development of or deny approval of our vaccine candidates. Such side effects could also affect trial recruitment or the ability of enrolled subjects to complete the clinical trial or result in potential product liability claims. A data safety monitoring board may also suspend or terminate a clinical trial at any time on various grounds, including a finding that the research volunteers are being exposed to an unacceptable health risk. Vaccine-related side effects could also affect recruitment or the ability of enrolled subjects to complete the trial or result in potential product liability claims. In addition, any vaccine to be approved in pediatric populations may need to undergo extensive vaccine-vaccine interference studies with the standard-of-care pediatric vaccine regimen. Further, to the extent field efficacy studies are required, prophylactic vaccines typically require clinical testing in thousands to tens of thousands of healthy volunteers to define an approvable benefit-risk profile. The need to show a high degree of safety and tolerability when dosing healthy individuals could result in rare and even spurious safety findings, negatively impacting a program prior to or after commercial launch. Any of these occurrences may harm our business, financial condition and prospects significantly.

Negative developments and negative public opinion of new technologies on which we rely may damage public perception of our vaccine candidates or adversely affect our ability to conduct our business or obtain regulatory approvals for our vaccine candidates.

Negative developments and negative public opinion of new or existing technologies on which we rely may damage public perception of our vaccine candidates or adversely affect our ability to conduct our business or obtain regulatory approvals for our vaccine candidates. Public perception may be influenced by claims that vaccines are unsafe, and products incorporating new vaccine technology may not gain the acceptance of the public or the medical community. Adverse public attitudes may negatively impact our ability to enroll subjects in clinical trials. Moreover, our success will depend upon physicians prescribing, and their patients being willing to receive, our vaccine candidates in lieu of, or in addition to, existing, more familiar vaccines for which greater clinical data may be available. Any increase in negative perceptions of the technologies that we rely on may result in fewer physicians prescribing our products or may reduce the willingness of patients to utilize our products or participate in clinical trials for our vaccine candidates.

We may not be able to file IND applications to commence clinical trials on the timelines we expect, and even if we are able to, the FDA may not permit us to proceed.

Our timing of submitting the IND applications for our product candidates is dependent on preclinical and manufacturing success, and if we experience additional delays, we may fail to meet our anticipated timelines. In addition, we cannot be sure that submission of an IND application or IND application amendment will result in the FDA allowing testing and clinical trials to begin, or that, once begun, issues will not arise that suspend or terminate such clinical trials. Additionally, even if such regulatory authorities agree with the design and implementation of the clinical trials set forth in an IND or clinical trial application, we cannot guarantee that such regulatory authorities will not change their requirements in the future.

We may encounter substantial delays in our clinical trials or may not be able to conduct our trials on the timelines we expect.

Clinical testing is expensive, time consuming and subject to uncertainty. We cannot guarantee that any clinical studies will be conducted as planned or completed on schedule, if at all. Even if these trials begin as planned, issues may arise that could suspend or terminate such clinical trials. A failure of one or more clinical studies can occur at any stage of testing, and our future clinical studies may not be successful. Events that may prevent successful or timely completion of clinical development include, but are not limited to:

- inability to generate sufficient preclinical, toxicology or other in vivo or in vitro data to support the initiation of clinical trials;
- delays in sufficiently developing, characterizing or controlling a manufacturing process suitable for advanced clinical trials;
- delays in reaching a consensus with regulatory agencies on study design or clinical or regulatory strategies;
- delays in reaching agreement on acceptable terms with prospective CROs and clinical study sites, the terms of which can be subject to extensive negotiation and may vary significantly among different CROs and clinical study sites;
- delays in obtaining required institutional review board ("IRB") approval at each clinical study site;
- imposition of a temporary or permanent clinical hold by regulatory agencies for a number of reasons, including after review of an IND application or amendment, or equivalent application or amendment; as a result of a new safety finding that presents unreasonable risk to clinical trial participants; a negative finding from an inspection of our clinical study operations or study sites; developments on trials conducted by competitors for related technology that raise FDA concerns about risk to patients of the technology broadly; or if the FDA finds that the investigational protocol or plan is clearly deficient to meet its stated objectives;
- delays in adding a sufficient number of trial sites and recruiting volunteers to participate in our clinical trials;
- failure by our CROs, other third parties or us, to adhere to clinical study requirements;
- failure to perform in accordance with the FDA's good clinical practice ("GCP") requirements or applicable regulatory guidelines in other jurisdictions;
- transfer of manufacturing processes to any new CMO or our own manufacturing facilities or any other development or commercialization partner for the manufacture of vaccine candidates;
- delays in having subjects complete participation in a study or return for post-injection follow-up;
- subjects dropping out of a study;
- occurrence of side effects associated with our vaccine candidates that are viewed to outweigh their potential benefits;

- changes in regulatory requirements and guidance that require amending or submitting new clinical protocols;
- changes in the standard-of-care on which a clinical development plan was based, which may require new or additional trials;
- the cost of clinical trials of our vaccine candidates being greater than we anticipate;
- clinical studies of our vaccine candidates producing negative or inconclusive results, which may result in our deciding, or regulators requiring us, to conduct additional clinical studies or abandon product development programs;
- delays or failure to secure supply agreements with suitable raw material suppliers, or any failures by suppliers to meet our quantity or quality requirements for necessary raw materials; and
- delays in manufacturing, testing, releasing, validating or importing/exporting sufficient stable quantities of our vaccine candidates for use in clinical studies or the inability to do any of the foregoing.

For example, based on the positive topline results from the VAX-24 Phase 1/2 proof-of-concept study, which evaluated the safety, tolerability and immunogenicity of VAX-24 in adults 18-64 years of age, the FDA supported the initiation of a pediatric study in infants. This study could uncover risks in this study population that could have potentially been discovered during a child and/or toddler study, which could then delay completion of clinical development. Any inability to successfully complete preclinical and clinical development could result in additional costs to us or impair our ability to generate revenue. In addition, if we make manufacturing or formulation changes to our vaccine candidates, we may be required to or we may elect to conduct additional studies to bridge our modified vaccine candidates to earlier versions. Clinical trial delays could also shorten any periods during which our products have patent protection and may allow our competitors to bring products to market before we do, which could impair our ability to successfully commercialize our vaccine candidates and may harm our business and results of operations.

If we encounter difficulties enrolling subjects in any clinical trials we may conduct, including any field efficacy trials that may be required, our clinical development activities could be delayed or otherwise adversely affected.

We may experience difficulties in enrolling subjects in any clinical trials we may conduct for a variety of reasons. The timely completion of clinical trials in accordance with their protocols depends, among other things, on our ability to enroll a sufficient number of subjects who remain in the study until its conclusion. The enrollment of subjects depends on many factors, including but not limited to:

- the eligibility and exclusion criteria defined in the protocol;
- the size of the population required for analysis of the trial's primary endpoints;
- the proximity of volunteers to study sites;
- the design of the trial;
- our ability to recruit clinical trial investigators with the appropriate competencies and experience;
- our ability to obtain and maintain subject consents;
- the ability to monitor volunteers adequately during and after injection;
- the risk that volunteers enrolled in clinical trials will drop out of the trials before the injection of our vaccine candidates or trial completion; and
- the risks and disruptions related to patient and physician investigator recruitment and retention and study site initiation and clinical trial activities.

To the extent we are required to conduct any field efficacy studies, enrollment of a sufficient number of subjects may require additional time and resources given widespread vaccination rates in the United States, particularly in the pediatric population. As a result, we may be required to conduct any such trials outside the United States, which could cause additional complexity and delay. Delays in enrollment may result in increased costs or

may affect the timing or outcome of any clinical trials we may conduct, which could prevent completion of these trials and adversely affect our ability to advance the development of our vaccine candidates.

Interim topline and preliminary data from our clinical trials that we announce or publish from time to time may change as more patient data become available and are subject to audit and verification procedures that could result in material changes in the final data.

From time to time, we may publish interim topline or preliminary data from our preclinical or clinical trials. Interim topline data from clinical trials that we may complete are subject to the risk that one or more of the clinical outcomes may materially change as more patient data become available. We also make assumptions, estimations, calculations and conclusions as part of our analyses of data, and we may not have received or had the opportunity to fully and carefully evaluate all data when we publish such data. As a result, the topline results that we report may differ from future results of the same studies, or different conclusions or considerations may qualify such results once additional data have been received and fully evaluated. Preliminary or topline data also remain subject to audit and verification procedures that may result in the final data being materially different from the preliminary data we may publish. As a result, interim and preliminary data should be viewed with caution until the final data are available. Adverse differences between preliminary or interim data and final data could significantly harm our business prospects.

Further, others, including regulatory agencies, may not accept or agree with our assumptions, estimates, calculations, conclusions or analyses or may interpret or weigh the importance of data differently, which could impact the value of the particular program, the approvability or commercialization of the particular vaccine candidate and our company in general. In addition, the information we choose to publicly disclose regarding a particular study or clinical trial is based on what is typically extensive information, and you or others may not agree with what we determine is the material or otherwise appropriate information to include in our disclosure. Any information we determine not to disclose may ultimately be deemed significant by you or others with respect to future decisions, conclusions, views, activities or otherwise regarding a particular vaccine candidate or our business. If the topline data that we report differ from final results, or if others, including regulatory authorities, disagree with the conclusions reached, our ability to obtain approval for, and commercialize, vaccine candidates may be harmed, which could significantly harm our business prospects.

We have in the past and may in the future seek Breakthrough Therapy designation or Fast Track designation by the FDA for one or more of our vaccine candidates, but we may not receive the designations we seek, and even if we do, such designation may not lead to a faster development or regulatory review or approval process and it does not increase the likelihood that our vaccine candidates will receive marketing approval.

We have in the past and may in the future seek Breakthrough Therapy or Fast Track designation for some of our vaccine candidates. For instance, in August 2022 we announced that the FDA granted Fast Track designation to VAX-24 in adults ages 18 and older and, in January 2023, we announced that the FDA granted Breakthrough Therapy designation for VAX-24 for the prevention of IPD in adults. A sponsor may seek FDA designation of its vaccine candidate as a Breakthrough Therapy if the vaccine candidate is intended to treat a serious or life-threatening disease or condition and preliminary clinical evidence indicates that the therapy may demonstrate substantial improvement over existing therapies on one or more clinically significant endpoints, such as substantial treatment effects observed early in clinical development. For vaccines that have been designated as Breakthrough Therapies, the FDA may take actions to expedite the development and review of the application, and interaction and communication between the FDA and the sponsor of the trial can help to identify the most efficient path for clinical development while minimizing the number of patients placed in ineffective control regimens.

A vaccine designated as a Breakthrough Therapy by the FDA may also be eligible for expedited review and approval. If a vaccine candidate is intended for the treatment of a serious or life-threatening condition and clinical or preclinical data demonstrate the potential to address unmet medical needs for this condition, the sponsor may apply for Fast Track designation. The FDA has broad discretion whether or not to grant this designation, so even if we believe a particular vaccine candidate is eligible for this designation, we cannot assure you that the FDA would decide to grant it.

Even when we obtain Fast Track designation for one or more of our vaccine candidates, we may not experience a faster development process, review or approval compared to non-expedited FDA review procedures. For instance, although the FDA has granted Fast Track designation to VAX-24 in adults, we may not experience a faster development, review or approval process compared to the conventional process. In addition, the FDA may withdraw Fast Track designation from VAX-24, or from any other of our vaccine candidates that may receive the designation in the future, if it believes that the designation is no longer supported. Fast Track designation alone does not guarantee qualification for the FDA's Priority Review procedures.

Whether to grant Breakthrough Therapy or Fast Track designations are within the discretion of the FDA. Accordingly, even if we believe one of our vaccine candidates meets the criteria for these designations, the FDA may disagree and instead determine not to make such designation. In any event, the receipt of either of these designations for a vaccine candidate may not result in a faster development process, review or approval compared to vaccine candidates considered for approval under non-expedited FDA review procedures and does not assure ultimate approval by the FDA. In addition, even when one or more of our vaccine candidates qualify for either of these designations, the FDA may later decide that the vaccine candidate no longer meets the conditions for qualification and rescind the designations.

We currently have no marketing and sales organization, and as an organization have no experience in marketing products. If we are unable to establish marketing and sales capabilities or enter into agreements with third parties to market and sell our vaccine candidates, we may not be able to generate product revenue.

We currently have no sales, marketing or distribution capabilities and as an organization have no experience in marketing products. If we develop an in-house marketing organization and sales force, we will require significant capital expenditures, management resources and time, and we will have to compete with other pharmaceutical and biotechnology companies to recruit, hire, train and retain marketing and sales personnel.

If we are unable or decide not to establish internal sales, marketing and distribution capabilities, we will pursue collaborative arrangements regarding the sales and marketing of our products; however, there can be no assurance that we will be able to establish or maintain such collaborative arrangements, or if we are able to do so, that they will have effective sales forces. Any revenue we receive will depend upon the efforts of such third parties, which may not be successful. We may have little or no control over the marketing and sales efforts of such third parties and our revenue from product sales may be lower than if we had commercialized our vaccine candidates ourselves. We also face competition in our search for third parties to assist us with the sales and marketing efforts of our vaccine candidates.

There can be no assurance that we will be able to develop in-house sales and distribution capabilities or establish or maintain relationships with third-party collaborators to commercialize any product that receives regulatory approval in the United States or overseas. If we are unable to develop in-house sales and distribution capabilities or enter into relationships with third-party collaborators on acceptable terms or at all, we may not be able to successfully commercialize our products. If we are not successful in commercializing our products or any future products, either on our own or through arrangements with one or more third parties, we may not be able to generate any future product revenue and we would incur significant additional losses.

A variety of risks associated with potentially conducting research and clinical trials abroad and marketing our vaccine candidates internationally could materially adversely affect our business.

As we pursue approval and commercialization for our vaccine candidates overseas and conduct CMC and other operations overseas, we will be subject to additional risks related to operating in foreign countries, including but not limited to:

- differing regulatory requirements in foreign countries;
- unexpected changes in tariffs, trade barriers, price and exchange controls and other regulatory requirements;
- increased difficulties in managing the logistics and transportation of storing and shipping vaccine candidates abroad;

- import and export requirements and restrictions;
- differing and changing data protection and privacy regimes and requirements;
- economic weakness, including inflation and interest rates, or political instability in particular foreign economies and markets;
- compliance with tax, employment, immigration and labor laws for employees living or traveling abroad;
- foreign taxes, including withholding of payroll taxes;
- foreign currency fluctuations, which could result in increased operating expenses and reduced revenue, and other obligations incident to doing business in another country;
- difficulties staffing and managing foreign operations;
- workforce uncertainty in countries where labor unrest is more common than in the United States;
- differing payor reimbursement regimes, governmental payors or patient self-pay systems and price controls;
- potential liability under the U.S. Foreign Corrupt Practices Act of 1977, as amended, or comparable foreign regulations;
- challenges enforcing our contractual and intellectual property rights, especially in those foreign countries that do not respect and protect intellectual property rights to the same extent as the United States;
- production shortages resulting from any events affecting raw material supply or manufacturing capabilities abroad; and
- business interruptions resulting from geopolitical actions, including war and terrorism.

These and other risks associated with our international operations and our collaborations with Lonza, based in Switzerland, may materially adversely affect our ability to attain or maintain profitable operations.

We are highly dependent on our key personnel, and if we are not able to retain these members of our management team or recruit and retain highly qualified personnel, we may not be able to successfully implement our business strategy.

Our ability to compete in the highly competitive biotechnology and pharmaceutical industries depends upon our ability to attract and retain highly qualified managerial, scientific and medical personnel. We are highly dependent on our management, scientific and medical personnel, including our Chief Executive Officer, our President and Chief Financial Officer, our Vice President of Research and our Executive Vice President and Chief Operating Officer. The loss of the services of any of our executive officers, other key employees and other scientific and medical advisors, and our inability to find suitable replacements, could result in delays in product development and harm our business.

We conduct substantially all of our operations at our facilities in the San Francisco Bay Area. This region is headquarters to many other biopharmaceutical companies and many academic and research institutions. Competition for skilled personnel in our market is intense and may limit our ability to hire and retain highly qualified personnel on acceptable terms or at all.

To induce valuable employees to remain at our company, in addition to salary and cash incentives, we have provided stock options and restricted stock units ("RSUs") that vest over time. The value to employees of stock options and RSUs that vest over time may be significantly affected by movements in our stock price that are beyond our control and may at any time be insufficient to counteract more lucrative offers from other companies. Despite our efforts to retain valuable employees, members of our management and scientific and development teams may terminate their employment with us on short notice. Although we have employment agreements with our key employees, these employment agreements provide for at-will employment, which means that any of our employees could leave our employment at any time, with or without notice. We do not maintain "key person" insurance

policies on the lives of these individuals or the lives of any of our other employees. Our success also depends on our ability to continue to attract, retain and motivate highly skilled junior, mid-level and senior managers as well as junior, mid-level and senior scientific and medical personnel.

We have grown rapidly and will need to continue to grow the size of our organization, and we may experience difficulties in managing this growth.

As our discovery, development, manufacturing and commercialization plans and strategies develop, we have rapidly expanded our employee base and expect to continue to add managerial, operational, sales, research and development, marketing, financial and other personnel. Current and future growth imposes significant added responsibilities on members of management, including but not limited to:

- identifying, recruiting, integrating, maintaining and motivating additional employees;
- managing our internal development efforts effectively, including the clinical and FDA review process for our vaccine candidates, while complying with our contractual obligations to contractors and other third parties; and
- improving our operational, financial and management controls, reporting systems and procedures.

Our future financial performance and our ability to commercialize our vaccine candidates will depend, in part, on our ability to effectively manage our growth. Our management may also have to divert a disproportionate amount of its attention away from day-to-day activities in order to devote a substantial amount of time to managing these growth activities.

If we are not able to effectively expand our organization by hiring new employees and expanding our groups of consultants and contractors, we may not be able to successfully implement the tasks necessary to further develop and commercialize our vaccine candidates and, accordingly, may not achieve our research, development, manufacturing and commercialization goals.

Obtaining and maintaining regulatory approval of our vaccine candidates in one jurisdiction does not mean that we will be successful in obtaining regulatory approval of our vaccine candidates in other jurisdictions.

Obtaining and maintaining regulatory approval of our vaccine candidates in one jurisdiction does not guarantee that we will be able to obtain or maintain regulatory approval in any other jurisdiction, while a failure or delay in obtaining regulatory approval in one jurisdiction may have a negative effect on the regulatory approval process in others. For example, even if the FDA grants marketing approval of a vaccine candidate, comparable regulatory authorities in foreign jurisdictions must also approve the manufacturing, marketing and promotion of the vaccine candidate in those countries. Approval procedures vary among jurisdictions and can involve requirements and administrative review periods different from, and greater than, those in the United States, including additional preclinical studies or clinical trials as clinical studies conducted in one jurisdiction may not be accepted by regulatory authorities in other jurisdictions. In many jurisdictions outside the United States, a vaccine candidate must be approved for reimbursement before it can be approved for sale in that jurisdiction. In some cases, the price that we intend to charge for our products is also subject to approval.

We may also submit marketing applications in other countries. Regulatory authorities in jurisdictions outside of the United States have requirements for approval of vaccine candidates with which we must comply prior to marketing in those jurisdictions. Obtaining foreign regulatory approvals and compliance with foreign regulatory requirements could result in significant delays, difficulties and costs for us and could delay or prevent the introduction of our products in certain countries. If we fail to comply with the regulatory requirements in international markets and/or receive applicable marketing approvals, our target market will be reduced and our ability to realize the full market potential of our vaccine candidates will be harmed.

We may form or seek strategic alliances or enter into additional licensing arrangements in the future, and we may not realize the benefits of such alliances or licensing arrangements.

We may form or seek strategic alliances, create joint ventures or collaborations or enter into additional licensing arrangements with third parties that we believe will complement or augment our discovery, development, manufacturing and commercialization efforts with respect to our vaccine candidates and any future vaccine candidates that we may seek to develop. Any of these relationships may require us to incur non-recurring and other charges, increase our near and long-term expenditures, issue securities that dilute our existing stockholders or disrupt our management and business. In addition, we face significant competition in seeking appropriate strategic partners, and the negotiation process is time-consuming and complex. Moreover, we may not be successful in our efforts to establish a strategic partnership or other alternative arrangements for our vaccine candidates because they may be deemed to be at too early of a stage of development for collaborative effort, and third parties may not view our vaccine candidates as having the requisite potential to demonstrate safety and efficacy. Any delays in entering into new strategic partnership agreements related to our vaccine candidates could delay the development, manufacturing and commercialization of our vaccine candidates in certain geographies for certain indications, which would harm our business prospects, financial condition and results of operations.

If we license products or businesses, we may not be able to realize the benefit of such transactions if we are unable to successfully integrate them with our existing operations and company culture. We cannot be certain that, following a strategic transaction or license, we will achieve the results, revenue or specific net income that justifies such transaction.

Revenue from any "catch up" opportunity may decline over time as more of the patient population is vaccinated.

We intend to initially seek approval of our VAX-24 or VAX-31 vaccine candidates in adults. If approved, we believe it may have the potential to serve as a "catch up" or booster to those adults who have previously received PPSV23 or a lower-valent PCV. Previous vaccines with a "catch up" opportunity have seen a high initial capture rate, but sales may decline over time as the number of individuals who remain unvaccinated with the new vaccine, and eligible for "catch up" opportunities, declines. Such decline could adversely affect our revenue over time.

If our information technology systems or those of the third parties upon which we rely, are or were compromised, we could experience adverse consequences resulting from such compromise, including but not limited to significant fines or other liability; regulatory investigations or actions; disruptions of our development programs or business operations; harms to our reputation, and other adverse consequences.

In the ordinary course of our business, we and the third parties upon which we rely collect, receive, use, retain, safeguard, disclose, share, transfer, make accessible, dispose of, transmit or otherwise process proprietary, confidential and sensitive information, including personal data (including, key-coded data, health information, data we collect about trial participants in connection with clinical trials and other special categories of personal data), intellectual property, trade secrets, and proprietary business information owned or controlled by ourselves or other parties, and other sensitive third-party data (collectively, "Sensitive Information").

We may use third-party service providers and subprocessors, including our CROs, to help us operate our business and engage in processing on our behalf in a variety of contexts, including, without limitation, cloud-based infrastructure, data center facilities, encryption and authentication technology, employee email and other functions. We may also share Sensitive Information with our partners or other third parties in connection with our business. Our ability to monitor these third parties' cybersecurity practices is limited, and these third parties may not have adequate information security measures in place. If our third-party service providers experience a security incident or other interruption, we could experience adverse consequences. While we may be entitled to damages if our third-party service providers fail to satisfy their privacy or security-related obligations to us, any award may be insufficient to cover our damages, or we may be unable to recover such award. In addition, supply-chain attacks have increased in frequency and severity, and we cannot guarantee that third parties' infrastructure in our supply chain or our third-party partners' supply chains have not been compromised.

Cyberattacks, malicious internet-based activity, online and offline fraud, and other similar activities threaten the confidentiality, integrity, and availability of our Sensitive Information and our information technology systems, and those of the third parties upon which we rely. Such threats are prevalent and continue to increase, are increasingly difficult to detect, and come from a variety of sources, including traditional computer "hackers"; threat actors; "hacktivists;" organized criminal threat actors; personnel (through theft or misuse); and sophisticated nation-state and nation-state supported actors. Some actors now engage and are expected to continue to engage in cyber-attacks, including without limitation nation-state actors for geopolitical reasons and in conjunction with military conflicts and defense activities. During times of war and other major conflicts, we and the third parties upon which we rely may be vulnerable to a heightened risk of these attacks, including retaliatory cyber-attacks, that could materially disrupt our systems and operations, supply chain, and ability to produce, sell and distribute our services.

We and the third parties upon which we rely are subject to a variety of evolving threats, including but not limited to software bugs; malicious code (such as viruses and worms); social-engineering attacks (including through deep fakes, which may be increasingly more difficult to identify as a fake, and phishing attacks); employee error, theft or misuse; denial-of-service attacks (such as credential stuffing); malware (including as a result of advanced persistent threat intrusions); natural disasters; terrorism; war; telecommunication and electrical failures; supply-chain attacks; ransomware attacks; attacks enhanced or facilitated by AI; and, other similar threats. In particular, severe ransomware attacks, including those perpetrated by organized criminal threat actors, nation-states, and nation-state-supported actors, are becoming increasingly prevalent and can lead to significant interruptions in our operations, loss of data and income, reputational harm and diversion of funds. Extortion payments may alleviate the negative impact of a ransomware attack, but we may be unwilling or unable to make such payments due to, for example, applicable laws or regulations prohibiting such payments. We may also be the subject of server malfunction, software or hardware failures, supply-chain cyberattacks, loss of data or other computer assets and other similar issues.

Remote and hybrid work has become more common and has increased risks to our information technology systems and data, as more of our employees utilize network connections, computers and devices outside our premises or network, including working at home, while in transit and in public locations. Future or past business transactions (such as acquisitions or integrations) could expose us to additional cybersecurity risks and vulnerabilities, as our systems could be negatively affected by vulnerabilities present in acquired or integrated entities' systems and technologies. Furthermore, we may discover security issues that were not found during due diligence of such acquired or integrated entities, and it may be difficult to integrate companies into our information technology environment and security program.

While we have implemented security measures designed to protect against security incidents, there can be no assurance that these measures will be effective. We take steps designed to detect, mitigate, and remediate vulnerabilities in our information systems (such as our hardware and/or software, including that of third parties upon which we rely). We may not, however, be able to detect and remediate all such vulnerabilities, including on a timely basis. Despite our efforts to identify and remediate vulnerabilities, if any, in our information technology systems, our efforts may not be successful. Further, we may experience delays in developing and deploying remedial measures designed to address any such identified vulnerabilities. Vulnerabilities could be exploited and result in a security incident.

Any of the previously identified or similar threats could cause a security incident or other interruption. A security incident or other interruption could result in unauthorized, unlawful, or accidental acquisition, modification, destruction, loss, alteration, encryption, disclosure of, or access to data and could disrupt our ability (and that of third parties upon whom we rely) to provide our products or operate our business.

We may be required to expend significant resources, fundamentally change our business activities and practices, or modify our operations, including our clinical trial activities, or information technology in an effort to protect against security breaches and to mitigate, detect and remediate actual or potential vulnerabilities. Certain data privacy and security obligations may require us to implement and maintain specific security measures or industry-standard or reasonable security measures to protect our information technology systems and Sensitive Information. If we (or a third party upon which we rely) experience a security incident or are perceived to have experienced a security incident, we may experience adverse consequences, including interruptions in our operations, which could result in a disruption of our development programs and our business operations. For example, the loss

of clinical trial data from clinical trials could result in delays in our regulatory approval efforts and significantly increase our costs to recover or reproduce the data. To the extent that any disruption or security breach were to result in a loss of, or damage to, our data or applications, or inappropriate disclosure of confidential or proprietary information, we could incur liability and the further development, manufacturing and commercialization of our vaccine candidates could be delayed. Furthermore, consequences from an actual or perceived security breach may include: government enforcement actions (for example, investigations, fines, penalties, audits, and inspections); additional reporting requirements and/or oversight; restrictions on processing data (including personal data); litigation (including class claims); indemnification obligations; negative publicity; reputational harm; monetary fund diversions; interruptions in our operations (including availability of data); financial loss; and other similar harms. Security incidents and attendant consequences may cause customers to stop using our platform/products/services, deter new customers from using our products, and negatively impact our ability to grow and operate our business.

Additionally, applicable data privacy and security obligations, including, without limitation, laws, regulations, guidance as well as our internal and external policies and our contractual obligations, may require us to notify relevant stakeholders of security breaches, including affected individuals, partners, collaborators, regulators, law enforcement agencies, credit reporting agencies and others. Such disclosures are costly, and the disclosure or the failure to comply with such requirements could lead to litigation or other liability, fines, harm to our reputation, significant costs, or other materially adverse effects. There can be no assurance that any limitations or exclusions of liability in our contracts would be enforceable or adequate or protect us from liability or damages.

We cannot be sure that our insurance coverage, if any, will be adequate or otherwise protect us from or adequately mitigate liabilities or damages with respect to claims, costs, expenses, litigation, fines, penalties, business loss, data loss, regulatory actions or other materially adverse impacts arising out of our processing activities, privacy and security practices, or security breaches we may experience. The successful assertion of one or more large claims against use that exceeds our available insurance coverage, or results in changes to our insurance policies (including premium increases or the imposition of large excess or deductible or co-insurance requirements), could result in substantial cost increase or prevent us from obtaining insurance on acceptable terms. Additionally, our contracts may not contain limitations of liability, and even where they do, there can be no assurance that limitations of liability in our contracts are sufficient to protect us from liabilities, damages, or claims related to our data privacy and security obligations.

In addition to experiencing a security incident, third parties may gather, collect, or infer sensitive data about us from public sources, data brokers, or other means that reveals competitively sensitive details about our organization and could be used to undermine our competitive advantage or market position. Additionally, Sensitive Information of the Company, its vendors, or its partners could be leaked, disclosed, or revealed as a result of or in connection with our employees', personnel's, or vendors' use of generative AI technologies.

Business disruptions could seriously harm our future revenue and financial condition and increase our costs and expenses.

Our operations, and those of our CMOs, CROs and other contractors and consultants, could be subject to earthquakes, power shortages, telecommunications failures, water shortages, floods, hurricanes, typhoons, fires, extreme weather conditions, medical epidemics and other natural or man-made disasters or business interruptions, for which we are predominantly self-insured. The impact of climate change may increase these risks due to changes in weather patterns, such as increases in storm intensity, sea-level rise, melting of permafrost and temperature extremes on facilities or operations. The occurrence of any of these business disruptions could seriously harm our operations and financial condition and increase our costs and expenses.

Our ability to manufacture our vaccine candidates could be disrupted if our operations or those of our suppliers are affected by a man-made or natural disaster or other business interruption. Our corporate headquarters are located in California near major earthquake faults and fire zones. The ultimate impact on us, our significant suppliers and our general infrastructure of being located near major earthquake faults and fire zones and being consolidated in certain geographical areas is unknown, but our operations and financial condition could suffer in the event of a major earthquake, fire or other natural disaster.

If product liability lawsuits are brought against us, we may incur substantial liabilities and may be required to limit commercialization of our vaccine candidates.

We face an inherent risk of product liability as a result of the clinical testing of our vaccine candidates and will face an even greater risk if we commercialize any products. For example, we may be sued if our vaccine candidates cause or are perceived to cause injury or are found to be otherwise unsuitable during clinical testing, manufacturing, marketing or sale. Any such product liability claims may include allegations of defects in manufacturing, defects in design, a failure to warn of dangers inherent in the product, negligence, strict liability or a breach of warranties. Claims could also be asserted under state consumer protection acts. If we cannot successfully defend ourselves against product liability claims, we may incur substantial liabilities or be required to limit commercialization of our vaccine candidates. Even successful defense would require significant financial and management resources. Regardless of the merits or eventual outcome, liability claims may result in:

- decreased demand for our vaccine candidates;
- injury to our reputation;
- withdrawal of clinical trial participants;
- initiation of investigations by regulators;
- costs to defend the related litigation;
- a diversion of management's time and our resources;
- substantial monetary awards to trial participants or patients;
- product recalls, withdrawals or labeling, marketing or promotional restrictions;
- loss of revenue;
- exhaustion of any available insurance and our capital resources;
- the inability to commercialize any vaccine candidate; and
- a decline in our share price.

Our inability to obtain sufficient product liability insurance at an acceptable cost to protect against potential product liability claims could prevent or inhibit the commercialization of products we develop, alone or with corporate collaborators. Our insurance policies may also have various exclusions, and we may be subject to a product liability claim for which we have no coverage. Assuming we obtain clinical trial insurance for our clinical trials, we may have to pay amounts awarded by a court or negotiated in a settlement that exceed our coverage limitations or that are not covered by our insurance, and we may not have, or be able to obtain, sufficient capital to pay such amounts. Even if our agreements with any future corporate collaborators entitle us to indemnification against losses, such indemnification may not be available or adequate should any claim arise.

Our employees, principal investigators, consultants and commercial partners may engage in misconduct or other improper activities, including noncompliance with regulatory standards and requirements and insider trading.

We are exposed to the risk of fraud or other misconduct by our employees, principal investigators, consultants and commercial partners. Misconduct by these parties could include intentional failures, reckless and/or negligent conduct or unauthorized activities that violate (i) the laws and regulations of the FDA and other regulatory authorities, including those laws requiring the reporting of true, complete and accurate information to such authorities, (ii) manufacturing standards, (iii) federal and state data privacy, security, fraud and abuse and other healthcare laws and regulations in the United States and abroad and (iv) laws that require the true, complete and accurate reporting of financial information or data. In particular, sales, marketing and business arrangements in the healthcare industry are subject to extensive laws and regulations intended to prevent fraud, misconduct, kickbacks, self-dealing and other abusive practices. These laws and regulations restrict or prohibit a wide range of pricing, discounting, marketing and promotion, sales commission, customer incentive programs and other business arrangements. Such misconduct also could involve the improper use of individually identifiable information, including, without limitation, information obtained in the course of clinical trials, creating fraudulent data in our

preclinical studies or clinical trials or illegal misappropriation of drug product, which could result in regulatory sanctions and cause serious harm to our reputation. It is not always possible to identify and deter misconduct by employees and other third parties, and the precautions we take to detect and prevent this activity may not be effective in controlling unknown or unmanaged risks or losses or in protecting us from government investigations or other actions or lawsuits stemming from a failure to comply with these laws or regulations. Additionally, we are subject to the risk that a person or government could allege such fraud or other misconduct, even if none occurred. If any such actions are instituted against us and we are not successful in defending ourselves or asserting our rights, those actions could result in significant civil, criminal and administrative penalties, damages, fines, disgorgement, imprisonment, exclusion from participating in government-funded healthcare programs, such as Medicare and Medicaid, additional reporting requirements and oversight if we become subject to a corporate integrity agreement or similar agreement to resolve allegations of noncompliance with these laws, contractual damages, reputational harm and the curtailment or restructuring of our operations, any of which could have a negative impact on our business, financial condition, results of operations and prospects.

Changes in tax laws or tax rulings could affect our financial position.

In December 2017, the Tax Cuts and Jobs Act ("Tax Act") was signed into law. The Tax Act, among other things, contains significant changes to corporate taxation, including (i) changes to the expensing of research and development expenses for tax years beginning after December 31, 2021, (ii) reduction of the corporate tax rate from a top marginal rate of 35% to a flat rate of 21%, (iii) limitation of the tax deduction for interest expense to 30% of adjusted earnings (with certain exceptions, including for certain small businesses), (iv) limitation of the deduction for post-2017 net operating losses ("NOL") to 80% of current-year taxable income and elimination of net operating loss carrybacks for post-2017 NOLs, (v) immediate deductions for certain new investments instead of deductions for depreciation expense over time and (vi) modifying or repealing many business deductions and credits (including reducing the business tax credit for certain clinical testing expenses incurred in the testing of certain drugs for rare diseases or conditions generally referred to as "orphan drugs"). Effective January 1, 2022, we are also subject to mandatory capitalization of Section 174 research and development expenditures. The capitalized expenses are subject to amortization over five and fifteen years for expenses incurred within the U.S. and outside of U.S., respectively.

In March 2020, the Coronavirus Aid, Relief, and Economic Security ("CARES Act") was signed into law. The CARES Act changed certain provisions of the Tax Act. Under the CARES Act, NOLs arising in taxable years beginning after December 31, 2017 and before January 1, 2021 may be carried back to each of the five taxable years preceding the tax year of such loss, but NOLs arising in taxable years beginning after December 31, 2020 may not be carried back. In addition, the CARES Act eliminated the limitation on the deduction of NOLs to 80% of current year taxable income for taxable years beginning before January 1, 2021, and increased the amount of interest expense that may be deducted to 50% of adjusted taxable income for taxable years beginning in 2019 or 2020. Notwithstanding the reduction in the corporate income tax, these benefits do not impact our current tax provision.

On December 21, 2020, the President of the United States signed into law the "Consolidated Appropriations Act, 2021," which includes further COVID-19 economic relief and extension of certain expiring tax provisions. The relief package includes a tax provision clarifying that businesses with forgiven Paycheck Protection Program ("PPP") loans can deduct regular business expenses that are paid for with the loan proceeds. Additional pandemic relief tax measures include an expansion of the employee retention credit, enhanced charitable contribution deductions and a temporary full deduction for business expenses for food and beverages provided by a restaurant for tax years 2021 and 2022.

The Infrastructure Investment and Jobs Act was signed on November 15, 2021, and it contained several tax provisions including changes to the Employee Retention Tax Credit and changes to excise taxes. These provisions do not have a material impactful to our current tax provision.

In accordance with the 2017 Tax Act, research and experimental ("R&E") expenses under Internal Revenue Code Section 174 are required to be capitalized beginning in 2022. R&E expenses are required to be amortized over a period of five years for domestic expenses and 15 years for foreign expenses. We have capitalized research and experimental expenditures in our current tax provision as a result.

The IRA of 2022 specifically introduces the topic of corporate alternative minimum tax on adjusted financial statement income on applicable corporations for taxable years beginning after December 31, 2022. There is no impact to our current tax provision.

The American Rescue Plan Act was signed on March 11, 2021. One of the provisions of the Act included expanding the definition of covered employees subject to IRC 162(m) to include an additional top five highest compensated officers beyond the CEO, CFO, and three highest paid employees currently covered under IRC 162(m). This expanded provision is applicable for tax years beginning after December 31, 2026. We do not believe that this update to IRC 162(m) would have a material impact on our income tax provision currently and will continue to monitor this.

We are unable to predict what tax changes may be enacted in the future or what effect such changes would have on our business, but such changes could affect our effective tax rate and could have an adverse effect on our overall tax position in the future, along with increasing the complexity, burden, and cost of tax compliance.

Our ability to utilize our NOL carryforwards and certain other tax attributes may be limited.

We have incurred substantial losses since inception and do not expect to become profitable in the near future, if ever. As of December 31, 2023, we had federal and state NOL carryforwards of $351.9 million and $693.6 million, respectively. The federal and state loss carryforwards, except the federal loss carryforward arising in tax years beginning after December 31, 2017, begin to expire in 2034 unless previously utilized. Federal NOLs arising in tax years beginning after December 31, 2017 have an indefinite carryforward period and do not expire. As of December 31, 2023, we also had federal and state research credit carryforwards of $12.8 million and $4.6 million, respectively. The federal research and development tax credit carryforwards expire beginning in 2039 unless previously utilized, and the state research and development tax credits can be carried forward indefinitely. In general, under Sections 382 and 383 of the U.S. Internal Revenue Code of 1986, as amended, a corporation that undergoes an "ownership change" (generally defined as a greater than 50 percentage point change (by value) in its equity ownership by certain stockholders over a rolling three-year period) is subject to limitations on its ability to utilize its pre-change NOLs to offset future taxable income. We have experienced ownership changes in the past. There were no ownership changes identified in 2023, as such we have determined that no federal research credits will expire unutilized or are excluded from our research carryforwards as of December 31, 2023. Subsequent ownership changes may affect the limitation in future years. As a result, if, and to the extent that we earn net taxable income, our ability to use our pre-change NOLs to offset such taxable income may be subject to limitations.

Our insurance policies may be inadequate and potentially expose us to unrecoverable risks.

Although we intend to maintain product liability insurance coverage, such insurance may not be adequate to cover all liabilities that we may incur. We anticipate that we will need to increase our insurance coverage each time we commence a clinical trial and if we successfully commercialize any vaccine candidate. Insurance availability, coverage terms and pricing continue to vary with market conditions. We endeavor to obtain appropriate insurance coverage for insurable risks that we identify; however, we may fail to correctly anticipate or quantify insurable risks, we may not be able to obtain appropriate insurance coverage and insurers may not respond as we intend to cover insurable events that may occur. Conditions in the insurance markets relating to nearly all areas of traditional corporate insurance change rapidly and may result in higher premium costs, higher policy deductibles and lower coverage limits. For some risks, we may not have or maintain insurance coverage because of cost or availability.

Risks Related to Our Reliance on Third Parties

We rely and will continue to rely on third parties to conduct our preclinical studies and clinical trials. If these third parties do not successfully carry out their contractual duties or meet expected deadlines, we may not be able to obtain regulatory approval of or commercialize our vaccine candidates.

We currently do not have the ability to independently conduct preclinical or clinical studies that comply with the regulatory requirements known as good laboratory practices and GCP. The FDA and regulatory authorities in other jurisdictions require us to comply with GCP requirements for conducting, monitoring, recording and

reporting the results of clinical trials, in order to ensure that the data and results are scientifically credible and accurate and that the trial subjects are adequately informed of the potential risks of participating in clinical trials. We rely on independent investigators and collaborators, such as universities, medical institutions, CROs and strategic partners, to conduct our preclinical and clinical trials under agreements with us.

We will need to negotiate budgets and contracts with CROs and study sites, which may result in delays to our development timelines and increased costs. We will rely heavily on these third parties over the course of our clinical trials, and we control only certain aspects of their activities. Nevertheless, we are responsible for ensuring that each of our studies is conducted in accordance with applicable protocol and legal, regulatory and scientific standards, and our reliance on third parties does not relieve us of our regulatory responsibilities. We and these third parties are required to comply with GCPs, which are regulations and guidelines enforced by the FDA and comparable foreign regulatory authorities for vaccine candidates in clinical development. Regulatory authorities enforce these GCPs through periodic inspections of trial sponsors, principal investigators and trial sites. If we or any of these third parties fail to comply with applicable GCP regulations, the clinical data generated in our clinical trials may be deemed unreliable, and the FDA or comparable foreign regulatory authorities may require us to perform additional clinical trials before approving our marketing applications. There can be no assurance that, upon inspection, such regulatory authorities will determine that any of our clinical trials comply with the GCP regulations. In addition, our clinical trials must be conducted with biologic product produced under cGMPs and will require a large number of test subjects. Our failure or any failure by these third parties to comply with these regulations or to recruit a sufficient number of subjects may require us to repeat clinical trials, which would delay the regulatory approval process. Moreover, our business may be implicated if any of these third parties violates federal or state fraud and abuse or false claims laws and regulations or healthcare privacy and security laws.

Any third parties conducting our preclinical studies and clinical trials will not be our employees and, except for remedies available to us under our agreements with such third parties, we cannot control whether or not they devote sufficient time and resources to our programs. These third parties may also have relationships with other commercial entities, including our competitors, for whom they may also be conducting clinical trials or other drug development activities, which could affect their performance on our behalf. If these third parties do not successfully carry out their contractual duties or obligations or meet expected deadlines, if they need to be replaced or if the quality or accuracy of the clinical data they obtain is compromised due to the failure to adhere to our clinical protocols or regulatory requirements or for other reasons, our clinical trials may be extended, delayed or terminated and we may not be able to complete development of, obtain regulatory approval of or successfully commercialize our vaccine candidates. As a result, our financial results and the commercial prospects for our vaccine candidates would be harmed, our costs could increase and our ability to generate revenue could be delayed.

If any of our relationships with trial sites or any CRO that we may use in the future terminate, we may not be able to enter into arrangements with alternative trial sites or CROs or do so on commercially reasonable terms. Switching or adding third parties to conduct our clinical trials involves substantial cost and requires extensive management time and focus. In addition, there is a natural transition period when a new third party commences work. As a result, delays occur, which can materially impact our ability to meet our desired clinical development timelines.

We rely on third parties, including Sutro Biopharma and Lonza, to supply raw materials and manufacture our preclinical and clinical product supplies of our vaccine candidates, and expect to rely on third parties to supply raw materials and produce and process our vaccine candidates, if approved. The loss of these suppliers or their failure to comply with applicable regulatory requirements or provide us with sufficient quantities at acceptable quality levels or prices, or at all, would materially and adversely affect our business.

We do not have the infrastructure or capability internally to manufacture supplies for our vaccine candidates or the materials necessary to produce our vaccine candidates for use in the conduct of our preclinical studies or clinical trials, and we lack the internal resources and the capability to manufacture any of our vaccine candidates on a preclinical, clinical or commercial scale. We have entered into an agreement with Sutro Biopharma to supply us with extract and custom reagents for use in manufacturing non-clinical and certain clinical supply of vaccine compositions. Pursuant to the Manufacturing Rights Agreement, we obtained exclusive rights to independently, or through certain third parties, develop, improve and manufacture cell-free extract for use in connection with our vaccine candidates. We have engaged Lonza to perform manufacturing process development

and clinical manufacture and supply of components for VAX-24, including the manufacture of polysaccharide antigens, our proprietary eCRM protein carrier and conjugated drug substances. We also engaged Lonza to perform manufacturing process development and clinical manufacture and supply of VAX-24 finished drug product.

In addition, Lonza is currently in the process of manufacturing our vaccine candidates on a clinical scale. In October 2023, Vaxcyte GmbH and Lonza entered into the Commercial Manufacturing and Supply Agreement pursuant to which Lonza will (i) construct and build out a Suite at Lonza's facilities in Visp, Switzerland to manufacture the Products, and (ii) maintain and operate the Suite (utilizing Lonza's employees) to manufacture the Products as a service provided to Vaxcyte GmbH. Pursuant to the Commercial Manufacturing and Supply Agreement, Lonza will be a preferred, non-exclusive, supplier of the Products to Vaxcyte GmbH, and Vaxcyte GmbH retains the right to procure the Products from one or more alternate and/or backup manufacturers of the Products (including at our own facilities). Our agreements with Lonza are denominated in Swiss Francs. Fluctuations in the exchange rate for Swiss Francs may increase our costs and affect our operating results.

We have not yet caused our vaccine candidates to be manufactured on a commercial scale and may not be able to achieve commercial scale manufacturing and may be unable to create an inventory of mass-produced product to satisfy demands for any of our vaccine candidates.

We do not yet have sufficient information to reliably estimate the cost of the commercial manufacturing and processing of our vaccine candidates, and the actual cost to manufacture and process our vaccine candidates could materially and adversely affect the commercial viability of our vaccine candidates. As a result, we may never be able to develop a commercially viable product.

In addition, our anticipated reliance on a limited number of third-party suppliers and manufacturers exposes us to the following risks, among others:

- We may be unable to identify manufacturers on acceptable terms or at all because the number of potential manufacturers is limited and the FDA may have questions regarding any replacement contractor. This may require new testing and regulatory interactions. In addition, a new manufacturer would have to be educated in, or develop substantially equivalent processes for, production of our products after receipt of FDA questions, if any;
- Our third-party suppliers and manufacturers might be unable to timely formulate and manufacture or supply raw materials for our vaccine candidates or produce the quantity and quality required to meet our clinical and commercial needs, if any. For example, if Sutro Biopharma, the independent alternate CMO or the designated third parties under the Manufacturing Rights Agreement are unable to provide a sufficient supply of cell-free extract, our third-party manufacturers may be delayed in their production of intermediate components, which may lead to delays of our drug substance manufacturing campaigns. Additionally, if Lonza is unable to identify a timely or manageable solution for handling cell-free extract during our clinical studies, such studies may be delayed, and we will incur additional costs;
- Contract manufacturers may not be able to execute our manufacturing procedures appropriately;
- Our future contract manufacturers may not perform as agreed or may not remain in the contract manufacturing business for the time required to supply our clinical trials or to successfully produce, store and distribute our products;
- Manufacturers are subject to ongoing periodic unannounced inspection by the FDA, the Drug Enforcement Administration and corresponding state agencies to ensure strict compliance with cGMP and other government regulations and corresponding foreign standards. We do not have control over third-party manufacturers' compliance with these regulations and standards;
- We may not own, or may have to share, the intellectual property rights to any improvements made by our third-party manufacturers in the manufacturing process for our products; and
- Our third-party suppliers and manufacturers could breach or terminate their agreement with us.

Each of these risks could delay our clinical trials, the approval, if any, of our vaccine candidates by the FDA or the commercialization of our vaccine candidates, or result in higher costs or deprive us of potential product

revenue. In addition, we will rely on third parties to perform release tests on our vaccine candidates prior to delivery to patients. If these tests are not appropriately done and test data are not reliable, patients could be put at risk of serious harm.

If we or our third-party suppliers use hazardous, non-hazardous, biological or other materials in a manner that causes injury or violates applicable law, we may be liable for damages.

Our research and development activities involve the controlled use of potentially hazardous substances, including chemical and biological materials. We and our suppliers are subject to federal, state and local laws and regulations in the United States governing the use, manufacture, storage, handling and disposal of medical and hazardous materials. Although we believe that we and our suppliers' procedures for using, handling, storing and disposing of these materials comply with legally prescribed standards, we and our suppliers cannot completely eliminate the risk of contamination or injury resulting from medical or hazardous materials. As a result of any such contamination or injury, we may incur liability or local, city, state or federal authorities may curtail the use of these materials and interrupt our business operations. In the event of an accident, we could be held liable for damages or penalized with fines, and the liability could exceed our resources. We do not have any insurance for liabilities arising from medical or hazardous materials. Compliance with applicable environmental laws and regulations is expensive, and current or future environmental regulations may impair our research, development and production efforts, which could harm our business prospects, financial condition or results of operations.

Risks Related to Government Regulation

The FDA regulatory approval process is lengthy and time-consuming, and we may experience significant delays in the clinical development and regulatory approval of our vaccine candidates.

The research, testing, manufacturing, labeling, approval, selling, import, export, marketing and distribution of drug products, including biologics such as conjugate vaccines, are subject to extensive regulation by the FDA and other regulatory authorities in the United States. We expect that our vaccine candidates will be regulated by the FDA as biologics. We are not permitted to market any biological drug product in the United States until we receive approval of a BLA from the FDA. We have not previously submitted a BLA to the FDA, or similar approval filings to comparable foreign regulatory authorities. A BLA must include extensive preclinical and clinical data and supporting information to establish the vaccine candidate's safety and effectiveness for each desired indication. Further, because our vaccine candidates that are subject to regulation as biological drug products, we will need to demonstrate that they are safe, pure and potent for use in their target indications. The BLA must also include significant information regarding the CMC for the product, including with respect to chain of identity and chain of custody of the product and various comparability assessments. The FDA's review of our BLA may be significantly delayed if the FDA views that the CMC information included in our submission is not adequate or requests additional CMC information or data.

Clinical testing is expensive and can take many years to complete, and its outcome is inherently uncertain. Failure can occur at any time during the clinical trial process. The results of preclinical studies of our vaccine candidates may not be predictive of the results of early-stage or later-stage clinical trials, and results of early clinical trials of our vaccine candidates may not be predictive of the results of later-stage clinical trials. The results of clinical trials in one set of patients or indications may not be predictive of those obtained in another. In some instances, there can be significant variability in safety or efficacy results between different clinical trials of the same vaccine candidate due to numerous factors, including changes in trial procedures set forth in protocols, differences in the size and type of the patient populations, changes in and adherence to the dosing regimen and other clinical trial protocols and the rate of dropout among clinical trial participants. Vaccine candidates in later stages of clinical trials may fail to show the desired safety and efficacy profile despite having progressed through preclinical studies and initial clinical trials. A number of companies in the biopharmaceutical industry have suffered significant setbacks in advanced clinical trials due to lack of efficacy or unacceptable safety issues, notwithstanding promising results in earlier trials. Most vaccine candidates that begin clinical trials are never approved by regulatory authorities for commercialization. In addition, even if such clinical trials are successfully completed, we cannot guarantee that the FDA or foreign regulatory authorities will interpret the results as we do, and more trials could be required before we submit a BLA or other marketing application.

We may also experience delays in completing planned clinical trials for a variety of reasons, including delays related to:

- obtaining regulatory authorization to begin a trial, if applicable;
- the availability of financial resources to commence and complete the planned trials;
- reaching agreement on acceptable terms with prospective CROs and clinical trial sites, the terms of which can be subject to extensive negotiation and may vary significantly among different CROs and trial sites;
- obtaining approval at each clinical trial site by an independent IRB;
- recruiting suitable volunteers to participate in and complete a trial;
- clinical trial sites deviating from trial protocol or dropping out of a trial;
- addressing any safety concerns that arise during the course of a trial;
- adding new clinical trial sites; or
- manufacturing sufficient quantities of qualified materials under cGMPs and applying them for use in clinical trials.

We could also encounter delays if physicians encounter unresolved ethical issues associated with enrolling patients in clinical trials of our vaccine candidates in lieu of using existing vaccines that have established safety and efficacy profiles. Further, a clinical trial may be suspended or terminated by us, the IRBs for the institutions in which such trials are being conducted or by the FDA or other regulatory authorities due to a number of factors, including failure to conduct the clinical trial in accordance with regulatory requirements or our clinical protocols, inspection of the clinical trial operations or trial site by the FDA or other regulatory authorities resulting in the imposition of a clinical hold, unforeseen safety issues or adverse side effects, failure to demonstrate a benefit from using a vaccine candidate, changes in governmental regulations or administrative actions, lack of adequate funding to continue the clinical trial or based on a recommendation by the data safety monitoring board. If we experience termination of, or delays in the completion of, any clinical trial of our vaccine candidates, the commercial prospects for our vaccine candidates will be harmed, and our ability to generate product revenue will be delayed. In addition, any delays in completing our clinical trials will increase our costs, slow down our product development and approval process and jeopardize our ability to commence product sales and generate revenue.

Many of the factors that cause, or lead to, a delay in the commencement or completion of clinical trials may ultimately lead to the denial of regulatory approval of our vaccine candidates.

The FDA may disagree with our regulatory plan, and we may fail to obtain regulatory approval of our vaccine candidates.

The general approach for FDA approval of a new biologic or drug is for the sponsor to provide dispositive data from two Phase 3 clinical trials of the relevant biologic or drug in the relevant patient population. Phase 3 clinical trials typically involve hundreds of patients, have significant costs and are time consuming. While we are still in the process of having discussions with the FDA regarding our Phase 3 regulatory plans, including discussions regarding our CMC strategy, the FDA may ultimately disagree with our regulatory strategy or we may be unable to successfully complete development to the FDA's satisfaction. We believe our previously reported topline results for VAX-24 support clinical non-inferiority to PCV20, but there can be no assurance that this approach in pivotal studies will be sufficient for regulatory approval or that certain regulators will not require field efficacy trials.

We may seek Accelerated Approval from the FDA for our vaccine candidates and, if granted, the FDA may require us to perform post-marketing studies as a condition of approval to verify and describe the predicted effect on irreversible morbidity or mortality or other clinical endpoints. If the results from such post-marketing studies are not positive or otherwise fail to show the predicted effect, the drug or biologic may be subject to expedited withdrawal procedures by the FDA. In addition, the standard-of-care may change with the approval of new products in the same disease areas that we are studying. This may result in the FDA or other regulatory

agencies requesting additional studies to show that our vaccine candidate is non-inferior or superior to the new products.

Our clinical trial results may also not support approval. In addition, our vaccine candidates could fail to receive regulatory approval for many reasons, including the following:

- the FDA or comparable foreign regulatory authorities may disagree with the design or implementation of our clinical trials;
- we may be unable to demonstrate to the satisfaction of the FDA or comparable foreign regulatory authorities that our vaccine candidates are safe and effective;
- the results of clinical trials may not meet the level of statistical significance required by the FDA or comparable foreign regulatory authorities for approval;
- we may be unable to demonstrate that our vaccine candidates' clinical and other benefits outweigh their safety risks;
- any changes to the required threshold for the achievement of non-inferiority using established surrogate immune endpoints that our PCVs will need to meet in our clinical trials;
- any vaccine to be approved in pediatric populations may need to undergo extensive vaccine-vaccine interference studies with the standard-of-care pediatric vaccine regimen;
- the need to perform superiority or field efficacy trials, which can be larger, longer and more costly, if an existing vaccine is approved for a disease indication;
- the FDA or comparable foreign regulatory authorities may disagree with our interpretation of data from preclinical studies or clinical trials;
- the data collected from clinical trials of our vaccine candidates may not be sufficient to the satisfaction of the FDA or comparable foreign regulatory authorities to support the submission of a BLA or other comparable submission in foreign jurisdictions or to obtain regulatory approval in the United States or elsewhere;
- the FDA or comparable foreign regulatory authorities will inspect the commercial manufacturing facilities we may utilize and may not approve such facilities; and
- the approval policies or regulations of the FDA or comparable foreign regulatory authorities may significantly change in a manner rendering our clinical data insufficient for approval.

Even if we receive regulatory approval of our vaccine candidates, we will be subject to ongoing regulatory obligations and continued regulatory review, which may result in significant additional expense, and we may be subject to penalties if we fail to comply with regulatory requirements or experience unanticipated problems with our vaccine candidates.

Any regulatory approvals that we receive for our vaccine candidates may also be subject to limitations on the approved indicated uses for which a product may be marketed or to the conditions of approval, or contain requirements for potentially costly post-marketing testing, including post-marketing clinical trials, and surveillance to monitor the safety and efficacy of the vaccine candidate.

In addition, if the FDA or a comparable foreign regulatory authority approves our vaccine candidates, the manufacturing processes, labeling, packaging, distribution, adverse event reporting, conduct of post-marketing studies, storage, sampling, advertising, promotion, import, export and recordkeeping for our vaccine candidates will be subject to extensive and ongoing regulatory requirements. These requirements include submissions of safety and other post-marketing information and reports, registration and continued compliance with cGMPs and GCPs for any clinical trials that we conduct post-approval. As such, we and our contract manufacturers will be subject to continual review and inspections to assess compliance with cGMP and adherence to commitments made in any BLA, other marketing application and previous responses to inspectional observations. Accordingly, we and others with whom we work must continue to expend time, money and effort in all areas of regulatory compliance, including

manufacturing, production and quality control. In addition, the FDA could require us to conduct another study to obtain additional safety or biomarker information. Further, we will be required to comply with FDA promotion and advertising rules, which include, among others, standards for direct-to-consumer advertising, restrictions on promoting products for uses or in patient populations that are not described in the product's approved uses (known as "off-label use"), limitations on industry-sponsored scientific and educational activities and requirements for promotional activities involving the internet and social media. Later discovery of previously unknown problems with our vaccine candidates, including side effects of unanticipated severity or frequency, or with our third-party suppliers or manufacturing processes, or failure to comply with regulatory requirements, may result in revisions to the approved labeling to add new safety information; imposition of post-market studies or clinical trials to assess new safety risks; or imposition of distribution or other restrictions. Other potential consequences include, among other things:

- restrictions on the marketing or manufacturing of our vaccine candidates, withdrawal of the product from the market or voluntary or mandatory product recalls;
- fines, warning letters or holds on clinical trials;
- refusal by the FDA to approve pending applications or supplements to approved applications filed by us or suspension or revocation of regulatory approvals;
- product seizure or detention, or refusal to permit the import or export of our vaccine candidates; and
- injunctions or the imposition of civil or criminal penalties.

The FDA's and other regulatory authorities' policies may change and additional government regulations may be enacted that could prevent, limit or delay regulatory approval of our vaccine candidates. We cannot predict the likelihood, nature or extent of government regulation that may arise from future legislation or administrative or executive action, either in the United States or abroad. If we are slow or unable to adapt to changes in existing requirements or the adoption of new requirements or policies, or if we are not able to maintain regulatory compliance, we may lose any marketing approval that we may have obtained, and we may not achieve or sustain profitability.

Any government investigation of alleged violations of law could require us to expend significant time and resources in response, and could generate negative publicity. Any failure to comply with ongoing regulatory requirements may significantly and adversely affect our ability to commercialize and generate revenue from our products. If regulatory sanctions are applied or if regulatory approval is withdrawn, the value of our company and our operating results will be adversely affected.

We expect the vaccine candidates we develop will be regulated as biological products, or biologics, and therefore they may be subject to competition sooner than anticipated.

The Biologics Price Competition and Innovation Act of 2009 (the "BPCIA") established an abbreviated pathway for the approval of biosimilar and interchangeable biological products. The regulatory pathway establishes legal authority for the FDA to review and approve biosimilar biologics, including the possible designation of a biosimilar as "interchangeable" based on its similarity to an approved biologic. Under the BPCIA, an application for a biosimilar product cannot be approved by the FDA until twelve years after the reference product was approved under a BLA. The law is complex and is still being interpreted and implemented by the FDA. As a result, its ultimate impact, implementation and meaning are subject to uncertainty. While it is uncertain when such processes intended to implement the BPCIA may be fully adopted by the FDA, any such processes could have a material adverse effect on the future commercial prospects for our biological products.

We believe that any of the vaccine candidates we develop that is approved in the United States as a biological product under a BLA should qualify for the 12-year period of exclusivity. However, there is a risk that this exclusivity could be shortened due to congressional action or otherwise, or that the FDA will not consider the subject vaccine candidates to be reference products for competing products, potentially creating the opportunity for generic competition sooner than anticipated. Moreover, the extent to which a biosimilar, once approved, will be substituted for any one of the reference products in a way that is similar to traditional generic substitution for

non-biological products is not yet clear, and will depend on a number of marketplace and regulatory factors that are still developing.

Our relationships with customers, physicians and third-party payors are subject, directly or indirectly, to federal and state healthcare fraud and abuse laws, health information privacy and security laws and other healthcare laws and regulations. If we or our employees, independent contractors, consultants, commercial partners and vendors violate these laws, we could face substantial penalties.

Healthcare providers, including physicians and third-party payors, in the United States and elsewhere will play a primary role in the recommendation and prescription of any vaccine candidates for which we obtain marketing approval. Our current and future arrangements with healthcare professionals, principal investigators, consultants, customers and third-party payors subject us to various federal and state fraud and abuse laws and other healthcare laws.

These laws may constrain the business or financial arrangements and relationships through which we conduct our operations, including how we research, market, sell and distribute our vaccine candidates, if approved. Such laws include:

- the U.S. federal Anti-Kickback Statute, which prohibits, among other things, persons or entities from knowingly and willfully soliciting, offering, receiving or providing any remuneration (including any kickback, bribe or certain rebate), directly or indirectly, overtly or covertly, in cash or in kind, to induce or reward, or in return for, either the referral of an individual for, or the purchase, lease, order or recommendation of, any good, facility, item or service, for which payment may be made, in whole or in part, under any U.S. federal healthcare program, such as Medicare and Medicaid. A person or entity does not need to have actual knowledge of the statute or specific intent to violate it in order to have committed a violation;
- the U.S. federal civil and criminal false claims laws, including the civil False Claims Act, which can be enforced through civil whistleblower or qui tam actions, and civil monetary penalties laws, which prohibit, among other things, individuals or entities from knowingly presenting, or causing to be presented, to the U.S. federal government, claims for payment or approval that are false or fraudulent, knowingly making, using or causing to be made or used, a false record or statement material to a false or fraudulent claim, or from knowingly making a false statement to avoid, decrease or conceal an obligation to pay money to the U.S. federal government. Pharmaceutical manufacturers can cause false claims to be presented to the U.S. federal government by engaging in impermissible marketing practices, such as the off-label promotion of a product for an indication for which it has not received FDA approval. In addition, the government may assert that a claim including items and services resulting from a violation of the U.S. federal Anti-Kickback Statute constitutes a false or fraudulent claim for purposes of the civil False Claims Act;
- the Health Insurance Portability and Accountability Act of 1996 ("HIPAA") which prohibits, among other things, knowingly and willfully executing, or attempting to execute, a scheme to defraud any healthcare benefit program, or knowingly and willfully falsifying, concealing or covering up a material fact or making any materially false statement, in connection with the delivery of, or payment for, healthcare benefits, items or services. Similar to the U.S. federal Anti-Kickback Statute, a person or entity does not need to have actual knowledge of the healthcare fraud statute implemented under HIPAA or specific intent to violate it in order to have committed a violation;
- HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act (the "HITECH") and its implementing regulations, which also impose certain obligations, including mandatory contractual terms, with respect to safeguarding the privacy and security of individually identifiable health information of covered entities subject to the rule, including health plans, healthcare clearinghouses and certain healthcare providers and their business associates, independent contractors of a covered entity that perform certain services involving the use or disclosure of individually identifiable health information for or on their behalf, as well as their covered subcontractors;

- the Federal Food Drug or Cosmetic Act, which prohibits, among other things, the adulteration or misbranding of drugs, biologics and medical devices;
- the U.S. Physician Payments Sunshine Act and its implementing regulations, which require certain manufacturers of drugs, devices, biologics and medical supplies that are reimbursable under Medicare, Medicaid or the Children's Health Insurance Program, with specific exceptions, to report annually to the Centers for Medicare & Medicaid Services ("CMS") information related to certain payments and other transfers of value to physicians (defined to include doctors, dentists, optometrists, podiatrists and chiropractors), other healthcare professionals (such as physician assistants and nurse practitioners), and teaching hospitals, as well as information regarding ownership and investment interests held by the physicians described above and their immediate family members;
- analogous U.S. state laws and regulations, including: state anti-kickback and false claims laws, which may apply to our business practices, including but not limited to, research, distribution, sales and marketing arrangements and claims involving healthcare items or services reimbursed by any third-party payor, including private insurers; state laws that require pharmaceutical companies to comply with the pharmaceutical industry's voluntary compliance guidelines and the relevant compliance guidance promulgated by the U.S. federal government, or otherwise restrict payments that may be made to healthcare providers and other potential referral sources; state laws and regulations that require drug manufacturers to file reports relating to pricing and marketing information, which require tracking gifts and other remuneration and items of value provided to healthcare professionals and entities; state and local laws requiring the registration of pharmaceutical sales representatives; and state laws governing the privacy and security of health information in certain circumstances, many of which differ from each other in significant ways and often are not preempted by HIPAA, thus complicating compliance efforts;
- similar healthcare laws and regulations in the EU and other jurisdictions, including reporting requirements detailing interactions with and payments to healthcare providers; and
- laws governing the privacy and security of certain protected information, such as the EU GDPR, and the CCPA, which impose obligations and restrictions on the collection, use and disclosure of personal data (including health data) relating to individuals located in the European Economic Area ("EEA") and California, respectively.

We may also be subject to other laws, such as the U.S. Foreign Corrupt Practices Act of 1977, as amended, which prohibit, among other things, U.S. companies and their employees and agents from authorizing, promising, offering or providing, directly or indirectly, corrupt or improper payments or anything else of value to foreign government officials, employees of public international organizations and foreign government owned or affiliated entities, candidates for foreign political office and foreign political parties or officials thereof, as well as federal consumer protection and unfair competition laws, which broadly regulate marketplace activities and activities that potentially harm consumers.

Ensuring that our internal operations and business arrangements with third parties comply with applicable healthcare laws and regulations will likely be costly. It is possible that governmental authorities will conclude that our business practices, including our relationships with physicians and other healthcare providers, some of whom are compensated in the form of stock options for consulting services provided, may not comply with current or future statutes, regulations or case law involving applicable fraud and abuse or other healthcare laws and regulations. If our operations are found to be in violation of any of these laws or any other governmental regulations that may apply to us, we may be subject to significant civil, criminal and administrative penalties, injunctions, damages, fines, disgorgement, imprisonment, exclusion from participating in government-funded healthcare programs, such as Medicare and Medicaid, additional reporting requirements and oversight if we become subject to a corporate integrity agreement or similar agreement to resolve allegations of noncompliance with these laws, contractual damages, reputational harm and the curtailment or restructuring of our operations.

Even if resolved in our favor, litigation or other legal proceedings relating to healthcare laws and regulations may cause us to incur significant expenses and could distract our technical and management personnel from their normal responsibilities. In addition, there could be public announcements of the results of hearings, motions or other interim proceedings or developments. If securities analysts or investors perceive these results to be

negative, it could have a substantial adverse effect on the price of our common stock. Such litigation or proceedings could substantially increase our operating losses and reduce the resources available for development, manufacturing, sales, marketing or distribution activities. Uncertainties resulting from the initiation and continuation of litigation or other proceedings relating to applicable healthcare laws and regulations could have an adverse effect on our ability to compete in the marketplace. In addition, if the physicians or other providers or entities with whom we expect to do business are found not to be in compliance with applicable laws, they may be subject to significant criminal, civil or administrative sanctions, including exclusions from government-funded healthcare programs.

Coverage and reimbursement may be limited or unavailable in certain market segments for our vaccine candidates, which could make it difficult for us to sell our vaccine candidates, if approved, profitably.

Successful sales of our vaccine candidates, if approved, depend on the availability of coverage and adequate reimbursement from third-party payors including governmental healthcare programs, such as Medicare and Medicaid, managed care organizations and commercial payors, among others. Significant uncertainty exists as to the coverage and reimbursement status of any vaccine candidates for which we obtain regulatory approval.

Patients who receive vaccines generally rely on third-party payors to reimburse all or part of the associated costs. Obtaining coverage and adequate reimbursement from third-party payors is critical to new product acceptance.

Third-party payors decide which drugs and treatments they will cover and the amount of reimbursement. Reimbursement by a third-party payor may depend upon a number of factors, including, but not limited to, the third-party payor's determination that use of a product is:

- a covered benefit under its health plan;
- safe, effective and medically necessary;
- appropriate for the specific patient;
- cost-effective; and
- neither experimental nor investigational.

Obtaining coverage and reimbursement of a product from a government or other third-party payor is a time-consuming and costly process that could require us to provide to the payor supporting scientific, clinical and cost-effectiveness data for the use of our products. Even if we obtain coverage for a given product, if the resulting reimbursement rates are insufficient, hospitals may not approve our product for use in their facility or third-party payors may require co-payments that patients find unacceptably high. Patients are unlikely to use our vaccine candidates unless coverage is provided and reimbursement is adequate to cover a significant portion of the cost of our vaccine candidates. Separate reimbursement for the product itself may or may not be available. Instead, the hospital or administering physician may be reimbursed only for administering the product. Further, from time to time, CMS revises the reimbursement systems used to reimburse health care providers, including the Medicare Physician Fee Schedule and Outpatient Prospective Payment System, which may result in reduced Medicare payments. In some cases, private third-party payors rely on all or portions of Medicare payment systems to determine payment rates. Changes to government healthcare programs that reduce payments under these programs may negatively impact payments from third-party payors and reduce the willingness of physicians to use our vaccine candidates. Certain ACA marketplace and other private payor plans are required to include coverage for certain preventative services, including vaccinations recommended by the ACIP without cost share obligations (i.e., co-payments, deductibles or co-insurance) for plan members. Children through 18 years of age without other health insurance coverage may be eligible to receive such vaccinations free-of-charge through the CDC's Vaccines for Children Program ("VFC"). For Medicare beneficiaries, vaccines may be covered under either the Part B program or Part D depending on several criteria, including the type of vaccine and the beneficiary's coverage eligibility. If our vaccine candidates, once approved, are covered only under the Part D program, physicians may be less willing to use our products because of the claims adjudication costs and time related to the claims adjudication process and collection of co-payments associated with the Part D program.

In the United States, no uniform policy of coverage and reimbursement for products exists among third-party payors. Therefore, coverage and reimbursement for products can differ significantly from payor to payor. Further, one payor's determination to provide coverage for a product does not assure that other payors will also provide coverage for the product. Adequate third-party reimbursement may not be available to enable us to maintain price levels sufficient to realize an appropriate return on our investment in product development. Further, coverage policies and third-party reimbursement rates may change at any time. Even if favorable coverage and reimbursement status is attained for one or more products for which we receive regulatory approval, less favorable coverage policies and reimbursement rates may be implemented in the future.

We intend to seek approval to market our vaccine candidates in both the United States and in selected foreign jurisdictions. If we obtain approval in one or more foreign jurisdictions for our vaccine candidates, we will be subject to rules and regulations in those jurisdictions. In some foreign countries, particularly those in Europe, the pricing of biologics is subject to governmental control. In these countries, pricing negotiations with governmental authorities can take considerable time after obtaining marketing approval of a vaccine candidate. Some of these countries may require the completion of clinical trials that compare the cost-effectiveness of a particular vaccine candidate to currently available vaccines. Other member states allow companies to fix their own prices for medicines but monitor and control company profits. The downward pressure on health care costs has become very intense. As a result, increasingly high barriers are being erected to the entry of new products. In addition, in some countries, cross-border imports from low-priced markets exert a commercial pressure on pricing within a country.

The marketability of any vaccine candidates for which we receive regulatory approval for commercial sale may suffer if government and other third-party payors fail to provide coverage and adequate reimbursement. We expect downward pressure on pharmaceutical pricing to continue. Further, coverage policies and third-party reimbursement rates may change at any time. Even if favorable coverage and reimbursement status is attained for one or more products for which we receive regulatory approval, less favorable coverage policies and reimbursement rates may be implemented in the future.

Healthcare legislative reform measures may have a negative impact on our business, financial condition, results of operations and prospects.

In the United States and some foreign jurisdictions, there have been, and we expect there will continue to be, several legislative and regulatory changes and proposed changes regarding the healthcare system that could prevent or delay marketing approval of vaccine candidates, restrict or regulate post-approval activities and affect our ability to profitably sell any vaccine candidates for which we obtain marketing approval. In particular, there have been and continue to be a number of initiatives at the U.S. federal and state levels that seek to reduce healthcare costs and improve the quality of healthcare. For example, in March 2010, the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act of 2010 (collectively, the "ACA"), was passed, which substantially changed the way healthcare is financed by both governmental and private payors in the United States. The ACA, among other things: (i) increased the minimum Medicaid rebates owed by manufacturers under the Medicaid Drug Rebate Program and extended the rebate program to individuals enrolled in Medicaid managed care organizations; (ii) created a new methodology by which rebates owed by manufacturers under the Medicaid Drug Rebate Program are calculated for certain drugs and biologics that are inhaled, infused, instilled, implanted or injected; (iii) established an annual, nondeductible fee on any entity that manufactures or imports certain specified branded prescription drugs and biologic agents apportioned among these entities according to their market share in specific government healthcare programs; (iv) expanded the eligibility criteria for Medicaid programs; (v) created a new Patient-Centered Outcomes Research Institute to oversee, identify priorities in, and conduct comparative clinical effectiveness research, along with funding for such research; (vi) created a new Medicare Part D coverage gap discount program, in which manufacturers must now agree to offer 70% point-of-sale discounts off negotiated prices of applicable brand drugs to eligible beneficiaries during their coverage gap period, as a condition for the manufacturer's outpatient drugs to be covered under Medicare Part D; (vii) and established a Center for Medicare & Medicaid Innovation at the Centers for Medicare & Medicaid Services ("CMS") to test innovative payment and service delivery models to lower Medicare and Medicaid spending, potentially including prescription drugs.

There have been executive, judicial and Congressional challenges to the ACA. For example, the Tax Act included a provision that repealed, effective January 1, 2019, the tax-based shared responsibility payment

imposed by the ACA on certain individuals who fail to maintain qualifying health coverage for all or part of a year, which is commonly referred to as the "individual mandate." On June 17, 2021, the United States Supreme Court dismissed a challenge on procedural grounds that argued the ACA is unconstitutional in its entirety because the "individual mandate" was repealed by Congress. Moreover, prior to the United States Supreme Court ruling, on January 28, 2021, President Biden issued an executive order that initiated a special enrollment period for purposes of obtaining health insurance coverage through the ACA marketplace. The executive order also instructed certain governmental agencies to review and reconsider their existing policies and rules that limit access to healthcare, including among others, reexamining Medicaid demonstration projects and waiver programs that include work requirements, and policies that create unnecessary barriers to obtaining access to health insurance coverage through Medicaid or the ACA. On August 16, 2022, President Biden signed the IRA, into law, which among other things, extends enhanced subsidies for individuals purchasing health insurance coverage in ACA marketplaces through plan year 2025. The IRA also eliminates the "donut hole" under the Medicare Part D program beginning in 2025 by significantly lowering the beneficiary maximum out-of-pocket cost and creating a new manufacturer discount program. It is possible that the ACA will be subject to judicial or Congressional challenges in the future. It is unclear how additional healthcare reform measures of the Biden administration will impact the ACA.

Other legislative changes have been proposed and adopted in the United States since the ACA was enacted. These changes include aggregate reductions to Medicare payments to providers of 2% per fiscal year pursuant to the Budget Control Act of 2011, which began in 2013 and, due to subsequent legislative amendments to the statute, including the Bipartisan Budget Act of 2015 and the Consolidated Appropriations Act of 2023, will remain in effect until 2032 unless additional Congressional action is taken. The American Taxpayer Relief Act of 2012, among other things, further reduced Medicare payments to several types of providers, including hospitals and cancer treatment centers, and increased the statute of limitations period for the government to recover overpayments to providers from three to five years.

Additional changes that may affect our business include the expansion of new programs such as Medicare payment for performance initiatives for physicians under the Medicare Access and CHIP Reauthorization Act of 2015 ("MACRA"), which ended the use of the statutory formula for clinician payment and established a quality payment incentive program, also referred to as the Quality Payment Program. This program provides clinicians with two ways to participate, including through the Advanced Alternative Payment Models ("APM") and the Merit-based Incentive Payment System ("MIPS"). Under both APMs and MIPS, performance data collected each performance year will affect Medicare payments in later years, including potentially reducing payments. At this time, the full impact of the introduction of the Medicare quality payment program on overall physician reimbursement remains unclear. Any reduction in reimbursement from Medicare or other government programs may result in a similar reduction in payments from private payors.

Further, in the United States there has been heightened governmental scrutiny over the manner in which manufacturers set prices for their marketed products, which has resulted in several Congressional inquiries and proposed and enacted federal and state legislation designed to, among other things, bring more transparency to drug and biological product pricing, reduce the cost of prescription drugs and biological products under government payor programs and review the relationship between pricing and manufacturer patient programs. At the federal level, the Trump administration used several means to propose or implement drug pricing reform, including through federal budget proposals, executive orders and policy initiatives. In July 2021, the Biden administration released an executive order, "Promoting Competition in the American Economy," with multiple provisions aimed at prescription drugs. In response to Biden's executive order, on September 9, 2021, the Department of Health and Human Services ("HHS") released a Comprehensive Plan for Addressing High Drug Prices that outlines principles for drug pricing reform and sets out a variety of potential legislative policies that Congress could pursue as well as potential administrative actions HHS can take to advance these principles. Further, the IRA will, among other things, (i) directs HHS to negotiate the price of certain high-expenditure, single-source drugs and biologics covered under Medicare, and subject drug manufacturers to civil monetary penalties and a potential excise tax by offering a price that is not equal to or less than the negotiated "maximum fair price" under the law, and (ii) imposes rebates under Medicare Part B and Medicare Part D to penalize price increases that outpace inflation. However, the IRA does not change either the VFC or the provisions added in 2010 under the ACA. VFC was established to give first-dollar coverage to children up to 18 years of age whose families could not pay for vaccinations while the ACA guaranteed coverage of vaccines without cost sharing for Americans who are either privately insured or newly covered in states that expanded Medicaid. The IRA did help with vaccine access by eliminating cost sharing for adult vaccines

covered under Medicare Part D and mandating that all state Medicaid programs cover certain adult vaccines and their administration without cost sharing. Further, many vaccines are excluded from Medicare Part B rebate requirements. The IRA permits HHS to implement many of these provisions through guidance, as opposed to regulation, for the initial years. These provisions take effect progressively starting in fiscal year 2023. On August 29, 2023, HHS announced the list of the first ten drugs that will be subject to price negotiations, although the Medicare drug negotiation program is currently subject to legal challenges. HHS has and will continue to issue and update guidance as these programs are implemented. It is currently unclear how the IRA will be effectuated but is likely to have a significant impact on the pharmaceutical industry. Further, in response to the Biden administration's October 2022 executive order, on February 14, 2023, HHS released a report outlining three new models for testing by the CMS Innovation Center which will be evaluated on their ability to lower the cost of drugs, promote accessibility, and improve quality of care. It is unclear whether the models will be utilized in any health reform measures in the future. Further, on December 7, 2023, the Biden administration announced an initiative to control the price of prescription drugs through the use of march-in rights under the Bayh-Dole Act. On December 8, 2023, the National Institute of Standards and Technology published for comment a Draft Interagency Guidance Framework for Considering the Exercise of March-In Rights which for the first time includes the price of a product as one factor an agency can use when deciding to exercise march-in rights. While march-in rights have not previously been exercised, it is uncertain if that will continue under the new framework. At the state level, legislatures have increasingly passed legislation and implemented regulations designed to control pharmaceutical and biological product pricing, including price or patient reimbursement constraints, discounts, restrictions on certain product access and marketing cost disclosure and transparency measures and, in some cases, designed to encourage importation from other countries and bulk purchasing. In addition, regional healthcare authorities and individual hospitals are increasingly using bidding procedures to determine which drugs, biological products and suppliers will be included in their healthcare programs. Furthermore, there has been increased interest by third-party payors and governmental authorities in reference pricing systems and publication of discounts and list prices.

We expect that additional U.S. federal healthcare reform measures will be adopted in the future, any of which could limit the amounts that the U.S. federal government will pay for healthcare products and services, which could result in reduced demand for our current or any future vaccine candidates or additional pricing pressures. We cannot predict the likelihood, nature or extent of government regulation that may arise from future legislation or administrative action in the United States or any other jurisdiction. If we or any third parties we may engage are slow or unable to adapt to changes in existing or new requirements or policies, or if we or such third parties are not able to maintain regulatory compliance, our current or any future vaccine candidates we may develop may lose any regulatory approval that may have been obtained and we may not achieve or sustain profitability.

We expect that these and other healthcare reform measures that may be adopted in the future may result in more rigorous coverage criteria and in additional downward pressure on the price that we receive for any approved product, which could have an adverse effect on demand for our vaccine candidates. Any reduction in reimbursement from Medicare or other government programs may result in a similar reduction in payments from private payors. The implementation of cost containment measures or other healthcare reforms may prevent us from being able to generate revenue, attain profitability or commercialize our products.

Changes in funding for the FDA and other government agencies could hinder our ability to hire and retain key leadership and other personnel, or otherwise prevent new products and services from being developed or commercialized in a timely manner, which could negatively impact our business.

The ability of the FDA to review and approve new products can be affected by a variety of factors, including government budget and funding levels, ability to hire and retain key personnel and accept the payment of user fees and statutory, regulatory and policy changes. Average review times at the FDA have fluctuated in recent years as a result. In addition, government funding of other government agencies that fund research and development activities is subject to the political process, which is inherently fluid and unpredictable.

Disruptions at the FDA and other agencies may also slow the time necessary for new drugs to be reviewed and/or approved by necessary government agencies, which would adversely affect our business. For example, over the last several years, including for 35 days beginning on December 22, 2018, the U.S. government has shut down several times and certain regulatory agencies, such as the FDA, have had to furlough critical FDA employees and stop critical activities. If a prolonged government shutdown occurs, it could significantly impact the

ability of the FDA to timely review and process our regulatory submissions, which could have a material adverse effect on our business.

If a prolonged government shutdown occurs, or if global health concerns prevent the FDA or other regulatory authorities from conducting their regular inspections, reviews, or other regulatory activities, it could significantly impact the ability of the FDA or other regulatory authorities to timely review and process our regulatory submissions, which could have a material adverse effect on our business.

We are subject to increasingly stringent and rapidly changing U.S. and foreign laws, regulations, and rules, contractual obligations, industry standards, policies and other obligations related to privacy and data security. The restrictions and costs imposed by these requirements, or our actual or perceived failure to comply with them, could lead to regulatory investigations or actions; litigation (including class claims) and mass arbitration demands; reputational harm; fines and penalties; loss or revenue or profits; and other adverse business consequences.

In the ordinary course of business, we process personal data and other Sensitive Information. We are subject to or affected by numerous evolving federal, state and foreign laws and regulations, as well as policies, contracts and other obligations governing the collection, use, disclosure, retention, and security of personal data. The global data protection landscape is rapidly evolving, and implementation standards and enforcement practices are likely to remain uncertain for the foreseeable future.

For example, HIPAA, as amended by HITECH, imposes requirements relating to the privacy and security of individually identifiable health information on health plans, healthcare clearinghouses and certain healthcare providers, and their respective contractors and their covered subcontractors that perform services for them involving individually identifiable health information. Additionally, certain states have adopted healthcare privacy and security laws and regulations comparable to HIPAA, some of which may be more stringent than HIPAA. In the event we fail to properly maintain the privacy and security of individually identifiable health information governed by HIPAA or comparable state laws, or we are responsible for an unauthorized disclosure or security breach of such information, we could be subject to enforcement action under HIPAA or comparable state laws, and significant civil and criminal penalties, and fines.

In the United States, federal, state, and local governments have enacted numerous data privacy and data security laws beyond HIPAA and other healthcare privacy laws, including data breach notification laws, personal data privacy laws, consumer protection laws (e.g., Section 5 of the Federal Trade Commission Act), and other similar laws (e.g., wiretapping laws). For example, the CCPA imposes obligations on businesses to which it applies, including but not limited to, providing specific disclosures in privacy notices and affording California residents certain rights related to their personal data. In addition, the CPRA expanded the CCPA's requirements, including by adding a new right of individuals to correct their personal data and establishing a new California Privacy Protection Agency to implement and enforce the CCPA. Certain states also impose stricter requirements for processing certain personal data, including sensitive information, such as conducting data privacy impact assessments. These state laws allow for statutory fines for noncompliance. For example, the CCPA allows for fines of up to $7,500 per intentional violation and allows for private litigants affected by certain data breaches to recover significant statutory damages. Other U.S. states have recently enacted comprehensive data privacy laws—including Virginia, Connecticut, Utah, and Colorado — and other local, state, and federal laws are currently under consideration. While these states, like the CCPA, also exempt some data processed in the context of clinical trials, these developments further complicate compliance efforts, and increase legal risk and compliance costs for us and the third parties upon which we rely. If we become subject to new data privacy laws, at the state level, the risk of enforcement action against us could increase because we may become subject to additional obligations, and the number of individuals or entities that can initiate actions against us may increase (including individuals, via a private right of action, and state actors).

In addition, our employees and personnel may use generative artificial intelligence ("AI") technologies to perform their work, and the disclosure and use of personal data in generative AI technologies is subject to various privacy laws and other privacy obligations. Governments have passed and are likely to pass additional laws regulating generative AI. Our use of this technology could result in additional compliance costs, regulatory investigations and actions, and lawsuits. If we are unable to use generative AI, it could make our business less efficient and result in competitive disadvantages.

We may also become subject to a growing body of privacy, data security and data protection laws outside of the United States as we expand our business and clinical trial activities. For example, the EU GDPR and the UK GDPR impose strict requirements for processing the personal data of individuals located, respectively within the EEA and the United Kingdom (the "UK"). Under either law, companies may face temporary or definitive bans on data processing and other corrective actions, fines of up to 20 million Euros under the EU GDPR, 17.5 million pounds sterling under the UK GDPR or, in each case, 4% of annual global revenue, whichever is greater; or private litigation related to processing of personal data brought by classes of data subjects or consumer protection organizations authorized at law to represent their interests.

In addition, many jurisdictions have enacted data localization laws and cross-border personal data transfer laws. These laws may make it more difficult for us to transfer personal data across jurisdictions, which could impede our business. In particular, the EEA and the UK have significantly restricted the transfer of personal data to the United States and other countries whose privacy laws it generally believes are inadequate. Other jurisdictions may adopt similarly stringent interpretations of their data localization and cross-border data transfer laws Although there are currently various mechanisms that may be used to transfer personal data from the EEA and UK to the United States in compliance with law, such as the EEA standard contractual clauses, the UK's International Data Transfer Agreement / Addendum, and the EU-U.S. Data Privacy Framework and the UK extension thereto (which allows for transfers to relevant U.S.-based organizations who self-certify compliance and participate in the Framework), these mechanisms are subject to legal challenges, and there is no assurance that we can satisfy or rely on these measures to lawfully transfer personal data to the United States. If we need but cannot implement a valid compliance mechanism for cross-border privacy and security transfers, or if the requirements for a legally-compliant transfer are too onerous, we may face increased exposure to regulatory actions, substantial fines, and injunctions against processing or transferring personal data from Europe or elsewhere. The inability to import personal data to the United States could significantly and negatively impact our business operations, including by limiting our ability to conduct clinical trial activities in Europe and elsewhere; limiting our ability to collaborate with parties that are subject to European and other data privacy and security laws; or requiring us to increase our personal data processing capabilities in Europe and/or elsewhere at significant expense.

Additionally, companies that transfer personal data out of the EEA and UK to other jurisdictions, particularly to the United States, are subject to increased scrutiny from regulators, individual litigants, and activist groups. In addition to data privacy and security laws, we are contractually subject to industry standards adopted by industry groups and may become subject to such obligations in the future. We are also bound by other contractual obligations related to data privacy and security, and our efforts to comply with such obligations may not be successful.

Obligations related to data privacy and security (and consumers' data privacy expectations) are quickly changing in an increasingly stringent fashion, creating some uncertainty as to the effective future legal framework. Additionally, these obligations may be subject to differing applications and interpretations, which may be inconsistent or in conflict among jurisdictions. Preparing for and complying with these obligations requires us to devote significant resources (including, without limitation, financial and time-related resources), which may necessitate changes to our information technologies, systems, and practices and to those of any third parties upon which we rely. In addition, these obligations may require us to change our business model.

Although we endeavor to comply with all applicable data privacy and security obligations, we may at times fail (or be perceived to have failed) to do so. Moreover, despite our efforts, our personnel or third parties upon which we rely may fail (or be perceived to have failed) to comply with such obligations, which could negatively impact our business operations and compliance posture. If we or the third parties on which we rely fail, or are perceived to have failed, to address or comply with data privacy and security obligations, we could face significant consequences. These consequences may include, but are not limited to, government enforcement actions (e.g., investigations, fines, penalties, audits, inspections, and similar); litigation (including class-related claims) and mass arbitration demands; additional reporting requirements and/or oversight; bans on processing personal data; orders to destroy or not use personal data; and imprisonment of company officials. In particular, plaintiffs have become increasingly more active in bringing privacy-related claims against companies, including class claims and mass arbitration demands. Some of these claims allow for the recovery of statutory damages on a per violation basis, and, if viable, carry the potential for monumental statutory damages, depending on the volume of data and the number of

violations. Any of these events could have a material adverse effect on our reputation, business, or financial condition, including but not limited to: loss of customers; interruptions or stoppages in our business operations (including clinical trials); inability to process personal data or to operate in certain jurisdictions; limited ability to develop or commercialize our products; expenditure of time and resources to defend any claim or inquiry; adverse publicity; or revision or restructuring of our operations.

Risks Related to Our Intellectual Property

If we are unable to obtain and maintain patent protection for our technology and products, or if the scope of the patent protection obtained is not sufficiently broad, we may not be able to compete effectively in our markets.

We rely upon a combination of patents, trademarks, trade secret protection and confidentiality agreements to protect the intellectual property related to our vaccine development programs and vaccine candidates. Our success depends in large part on our ability to obtain and maintain patent protection in the United States and other countries with respect to VAX-24, VAX-31 and any future vaccine candidates, as well as methods of making our vaccine candidates and components thereof. We seek to protect our proprietary position by filing patent applications in the United States and abroad related to our development programs and vaccine candidates. The patent prosecution process is expensive and time-consuming, and we may not be able to file and prosecute all necessary or desirable patent applications at a reasonable cost or in a timely manner.

The patents and patent applications that we own or in-license may fail to result in issued patents with claims that protect VAX-24 or any future vaccine candidate in the United States or in other foreign countries. There is no assurance that all of the potentially relevant prior art relating to our patents and patent applications has been found, which can prevent a patent from issuing from a pending patent application, or be used to invalidate a patent. Even if patents do successfully issue and even if such patents cover VAX-24 or any future vaccine candidate, third parties may challenge their validity, enforceability or scope, which may result in such patents being narrowed, invalidated or held unenforceable. Any successful opposition to these patents or any other patents owned by or licensed to us could deprive us of rights necessary for the successful commercialization of any vaccine candidates or companion diagnostic that we may develop. Further, if we encounter delays in regulatory approvals, the period of time during which we could market a vaccine candidate under patent protection could be reduced.

If the patent applications we hold or have in-licensed with respect to our development programs and vaccine candidates fail to issue, if their breadth or strength of protection is threatened, or if they fail to provide meaningful exclusivity for VAX-24 or any future vaccine candidate, it could dissuade companies from collaborating with us to develop vaccine candidates and threaten our ability to commercialize future vaccines. Any such outcome could have a materially adverse effect on our business.

The patent position of biotechnology and pharmaceutical companies generally is highly uncertain, involves complex legal and factual questions and has been and will continue to be the subject of litigation and new legislation. In addition, the laws of foreign countries may not protect our rights to the same extent as the laws of the United States. For example, many countries restrict the patentability of methods of treatment of the human body. Publications of discoveries in scientific literature often lag behind the actual discoveries, and patent applications in the United States and other jurisdictions are typically not published until 18 months after filing, or in some cases not at all. Therefore, we cannot know with certainty whether we were the first to make the inventions claimed in our owned or licensed patents or pending patent applications, or that we were the first to file for patent protection of such inventions. As a result of these and other factors, the issuance, scope, validity, enforceability and commercial value of our patent rights are highly uncertain. Our pending and future patent applications may not result in patents being issued which protect our technology or products, in whole or in part, or which effectively prevent others from commercializing competitive technologies and products. Changes in either the patent laws or interpretation of the patent laws in the United States and other countries may diminish the value of our patents or narrow the scope of our patent protection.

Moreover, we may be subject to a third-party pre-issuance submission of prior art to the U.S. Patent and Trademark Office (“USPTO”) or become involved in opposition, derivation, reexamination, inter partes review, post-grant review or interference proceedings challenging our patent rights or the patent rights of others. The costs of defending our patents or enforcing our proprietary rights in post-issuance administrative proceedings and litigation can be substantial and the outcome can be uncertain. An adverse determination in any such submission, proceeding or litigation could reduce the scope of, or invalidate, our patent rights, allow third parties to

commercialize our technology or products and compete directly with us, without payment to us, or result in our inability to manufacture or commercialize products without infringing third-party patent rights. In addition, if the breadth or strength of protection provided by our patents and patent applications is threatened, it could dissuade companies from collaborating with us to license, develop or commercialize current or future vaccine candidates.

The issuance of a patent is not conclusive as to its inventorship, scope, validity or enforceability, and our owned and licensed patents may be challenged in the courts or patent offices in the United States and abroad. Such challenges may result in loss of exclusivity or freedom to operate or in patent claims being narrowed, invalidated or held unenforceable, in whole or in part, which could limit our ability to stop others from using or commercializing similar or identical technology and products, or limit the duration of the patent protection of our technology and products. Generally, issued patents are granted a term of 20 years from the earliest claimed non-provisional filing date. In certain instances, patent term can be adjusted to recapture a portion of delay by the USPTO in examining the patent application (patent term adjustment) or extended to account for term effectively lost as a result of the FDA regulatory review period (patent term extension), or both. The scope of patent protection may also be limited. Without patent protection for our current or future vaccine candidates, we may be open to competition from generic versions of such products. Given the amount of time required for the development, testing and regulatory review of new vaccine candidates, patents protecting such candidates might expire before or shortly after such candidates are commercialized. As a result, our owned and licensed patent portfolio may not provide us with sufficient rights to exclude others from commercializing products similar or identical to ours.

If we fail to comply with our obligations under any license, collaboration or other agreements, we may be required to pay damages and could lose intellectual property rights that are necessary for developing and protecting our vaccine candidates.

We have licensed certain intellectual property rights related to the XpressCF platform, components of our PCV candidates, and methods of making components of VAX-24 from Sutro Biopharma and University of Georgia Research Foundation, Inc. We also license certain intellectual property rights related to a non-cross-reactive Group A Strep carbohydrate antigen and related methods of production from the Regents of the University of California. If, for any reason, these agreements are terminated or we otherwise lose those rights, it could adversely affect our business. These agreements impose, and any future collaboration agreements or license agreements we enter into are likely to impose, various development, commercialization, funding, milestone, royalty, diligence, sublicensing, insurance, patent prosecution and enforcement or other obligations on us. If we breach any material obligations, or use the intellectual property licensed to us in an unauthorized manner, we may be required to pay damages and the licensor(s) may have the right to terminate the license, which could result in us being unable to develop, manufacture and sell products that are covered by the licensed technology or enable a competitor to gain access to the licensed technology.

Obtaining and maintaining our patent protection depends on compliance with various procedural, document submission, fee payment and other requirements imposed by governmental patent agencies, and our patent protection could be reduced or eliminated for noncompliance with these requirements.

Periodic maintenance fees on any issued patent are due to be paid to the USPTO and other foreign patent agencies in several stages over the lifetime of the patent. The USPTO and various foreign national or international patent agencies require compliance with a number of procedural, documentary, fee payment and other similar provisions during the patent application process. While an inadvertent lapse can in many cases be cured by payment of a late fee or by other means in accordance with the applicable rules, there are situations in which noncompliance can result in abandonment or lapse of the patent or patent application, resulting in partial or complete loss of patent rights in the relevant jurisdiction. Noncompliance events that could result in abandonment or lapse of patent rights include, but are not limited to, failure to timely file national and regional stage patent applications based on our international patent application, failure to respond to official actions within prescribed time limits, non-payment of fees and failure to properly legalize and submit formal documents. If we or our licensors fail to maintain the patents and patent applications covering VAX-24 or any future vaccine candidate, or the XpressCF platform, our competitors might be able to enter the market, which would have an adverse effect on our business.

Third-party claims or litigation alleging infringement of patents or other proprietary rights, or seeking to invalidate our patents or other proprietary rights, may delay or prevent the development, manufacturing and commercialization of VAX-24 and any future vaccine candidate.

Our commercial success depends in part on our avoiding infringement and other violations of the patents and proprietary rights of third parties. There is a substantial amount of litigation, both within and outside the United States, involving patent and other intellectual property rights in the biotechnology and pharmaceutical industries, including patent infringement lawsuits, interferences, derivation and administrative law proceedings, inter partes review and post-grant review before the USPTO, as well as oppositions and similar processes in foreign jurisdictions. Numerous U.S. and foreign issued patents and pending patent applications, which are owned by third parties, exist in the fields in which we and our collaborators are developing vaccine candidates. As the biotechnology and pharmaceutical industries expand and more patents are issued, and as we gain greater visibility and market exposure as a public company, the risk increases that our vaccine candidates or other business activities may be subject to claims of infringement of the patent and other proprietary rights of third parties. Third parties may assert that we are infringing their patents or employing their proprietary technology without authorization.

Also, there may be third-party patents or patent applications with claims to materials, formulations, methods of manufacture or methods for treatment related to the use or manufacture of our vaccine candidates. Because patent applications can take many years to issue, there may be currently pending patent applications which may later result in issued patents that our vaccine candidates may infringe.

In addition, third parties may obtain patent rights in the future and claim that use of our technologies infringes upon these rights. If any third-party patents were held by a court of competent jurisdiction to cover the manufacturing process of any of our vaccine candidates, any molecules formed during the manufacturing process or any final product itself, the holders of any such patents may be able to block our ability to commercialize such vaccine candidate unless we obtained a license under the applicable patents, or until such patents expire. Similarly, if any third-party patent were held by a court of competent jurisdiction to cover aspects of our formulations, processes for manufacture or methods of use, including combination therapy, the holders of any such patent may be able to block our ability to develop and commercialize the applicable vaccine candidate unless we obtained a license or until such patent expires. In either case, such a license may not be available on commercially reasonable terms or at all. In addition, we may be subject to claims that we are infringing other intellectual property rights, such as trademarks or copyrights, or misappropriating the trade secrets of others, and to the extent that our employees, consultants or contractors use intellectual property or proprietary information owned by others in their work for us, disputes may arise as to the rights in related or resulting know-how and inventions.

Parties making claims against us may obtain injunctive or other equitable relief, which could effectively block our ability to further develop and commercialize one or more of our vaccine candidates. Defense of these claims, regardless of their merit, would involve substantial litigation expense and would be a substantial diversion of employee resources from our business. In the event of a successful infringement or other intellectual property claim against us, we may have to pay substantial damages, including treble damages and attorneys' fees for willful infringement, obtain one or more licenses from third parties, pay royalties or redesign our affected products, which may be impossible or require substantial time and monetary expenditure. We cannot predict whether any such license would be available at all or whether it would be available on commercially reasonable terms.

Furthermore, as the vaccine patent landscape is crowded and highly competitive, even in the absence of litigation we may need to obtain licenses from third parties to advance our research or allow commercialization of our vaccine candidates, and we have done so from time to time. We may fail to obtain any of these licenses at a reasonable cost or on reasonable terms, if at all. In that event, we would be unable to further develop and commercialize one or more of our vaccine candidates, which could harm our business significantly. We cannot provide any assurances that third-party patents do not exist which might be enforced against vaccine candidates resulting in either an injunction prohibiting our sales, or, with respect to our sales, an obligation on our part to pay royalties or other forms of compensation to third parties.

We may become involved in lawsuits to protect or enforce our patents, the patents of our licensors or our other intellectual property rights, which could be expensive, time consuming and unsuccessful.

Competitors may infringe or otherwise violate our patents, the patents of our licensors or our other intellectual property rights. To counter infringement or unauthorized use, we may be required to file legal claims, which can be expensive and time-consuming. In addition, in an infringement proceeding, a court may decide that a patent of ours or our licensors is not valid or is unenforceable, or may refuse to stop the other party from using the technology at issue on the grounds that our patents do not cover the technology in question. An adverse result in any litigation or defense proceedings could put one or more of our patents at risk of being invalidated or interpreted narrowly and could put our patent applications at risk of not issuing. The initiation of a claim against a third party may also cause the third party to bring counter claims against us such as claims asserting that our patents are invalid or unenforceable. In patent litigation in the United States, defendant counterclaims alleging invalidity or unenforceability are commonplace. Grounds for a validity challenge could be an alleged failure to meet any of several statutory requirements, including lack of novelty, obviousness, non-enablement, written description, or lack of patentable subject matter. Grounds for an unenforceability assertion could be an allegation that someone connected with prosecution of the patent withheld relevant material information from the USPTO, or made a materially misleading statement, during prosecution. Third parties may also raise similar validity claims before the USPTO in post-grant proceedings such as ex parte reexaminations, inter partes review or post-grant review, or oppositions or similar proceedings outside the United States, in parallel with litigation or even outside the context of litigation. The outcome following legal assertions of invalidity and unenforceability is unpredictable. We cannot be certain that there is no invalidating prior art, of which we and the patent examiner were unaware during prosecution. For the patents and patent applications that we have licensed, we may have limited or no right to participate in the defense of any licensed patents against challenge by a third party. If a defendant were to prevail on a legal assertion of invalidity or unenforceability, we would lose at least part, and perhaps all, of any future patent protection on our current or future vaccine candidates. Such a loss of patent protection could harm our business.

We may not be able to prevent, alone or with our licensors, misappropriation of our intellectual property rights, particularly in countries where the laws may not protect those rights as fully as in the United States. Our business could be harmed if in litigation the prevailing party does not offer us a license on commercially reasonable terms. Any litigation or other proceedings to enforce our intellectual property rights may fail, and even if successful, may result in substantial costs and distract our management and other employees.

Furthermore, because of the substantial amount of discovery required in connection with intellectual property litigation, there is a risk that some of our confidential information could be compromised by disclosure during this type of litigation. There could also be public announcements of the results of hearings, motions or other interim proceedings or developments. If securities analysts or investors perceive these results to be negative, it could have an adverse effect on the price of our common shares.

Changes in U.S. patent law or the patent law of other countries or jurisdictions could diminish the value of patents in general, thereby impairing our ability to protect our products.

The United States has enacted and implemented wide-ranging patent reform legislation. The U.S. Supreme Court has ruled on several patent cases in recent years, either narrowing the scope of patent protection available in certain circumstances or weakening the rights of patent owners in certain situations. In addition to increasing uncertainty with regard to our ability to obtain patents in the future, this combination of events has created uncertainty with respect to the value of patents, once obtained. Depending on actions by the U.S. Congress, the federal courts and the USPTO, the laws and regulations governing patents could change in unpredictable ways that would weaken our ability to obtain new patents or to enforce patents that we have licensed or that we might obtain in the future. For example, recent decisions raise questions regarding the award of patent term adjustment (PTA) for patents in families where related patents have issued without PTA. Thus, it cannot be said with certainty how PTA will/will not be viewed in future and whether patent expiration dates may be impacted. Similarly, changes in patent law and regulations in other countries or jurisdictions or changes in the governmental bodies that enforce them or changes in how the relevant governmental authority enforces patent laws or regulations may weaken our ability to obtain new patents or to enforce patents that we have licensed or that we may obtain in the future. For example, the complexity and uncertainty of European patent laws have also increased in recent years. In Europe, a new unitary patent system took effect June 1, 2023, which will significantly impact European patents, including

those granted before the introduction of such a system. Under the unitary patent system, European applications have the option, upon grant of a patent, of becoming a Unitary Patent which will be subject to the jurisdiction of the Unitary Patent Court ("UPC"). As the UPC is a new court system, there is no precedent for the court, increasing the uncertainty of any litigation. Patents granted before the implementation of the UPC have the option of opting out of the jurisdiction of the UPC and remaining as national patents in the UPC countries. Patents that remain under the jurisdiction of the UPC will be potentially vulnerable to a single UPC-based revocation challenge that, if successful, could invalidate the patent in all countries who are signatories to the UPC. We cannot predict with certainty the long-term effects of any potential changes.

Any trademarks we may obtain may be infringed or successfully challenged, resulting in harm to our business.

We expect to rely on trademarks as one means to distinguish any of our vaccine candidates that are approved for marketing from the products of our competitors. We have not yet selected trademarks for our vaccine candidates and have not yet begun the process of applying to register trademarks for our current or any future vaccine candidates. Once we select trademarks and apply to register them, our trademark applications may not be approved. Third parties may oppose our trademark applications or otherwise challenge our use of the trademarks. In the event that our trademarks are successfully challenged, we could be forced to rebrand our products, which could result in loss of brand recognition and could require us to devote resources to advertising and marketing new brands. Our competitors may infringe our trademarks, and we may not have adequate resources to enforce our trademarks.

In addition, any proprietary name we propose to use with our current or any other vaccine candidate in the United States must be approved by the FDA, regardless of whether we have registered it, or applied to register it, as a trademark. The FDA typically conducts a review of proposed product names, including an evaluation of the potential for confusion with other product names. If the FDA objects to any of our proposed proprietary product names, we may be required to expend significant additional resources in an effort to identify a suitable proprietary product name that would qualify under applicable trademark laws, not infringe the existing rights of third parties and be acceptable to the FDA.

We may not be able to protect our intellectual property rights throughout the world, which could impair our business.

Filing, prosecuting and defending patents covering our current vaccine candidates and any future vaccine candidate throughout the world would be prohibitively expensive. Competitors may use our technologies in jurisdictions where we have not obtained patent protection to develop their own products and, further, may export otherwise infringing products to territories where we may obtain patent protection, but where patent enforcement is not as strong as that in the United States. These products may compete with our products in jurisdictions where we do not have any issued or licensed patents and any future patent claims or other intellectual property rights may not be effective or sufficient to prevent them from so competing.

The ongoing conflict in Ukraine and related sanctions could significantly devalue our Eurasian patents validated in Russia, and Eurasian patent applications. Russian decrees may also significantly limit our ability to enforce Russian patents. We cannot predict when or how this situation will change.

Our reliance on third parties requires us to share our trade secrets, which increases the possibility that a competitor will discover them or that our trade secrets will be misappropriated or disclosed.

Because we rely on third parties to manufacture VAX-24, VAX-31 and potentially future vaccine candidates, and we collaborate with third parties on the development of VAX-24, VAX-31 and potentially future vaccine candidates, we must, at times, share trade secrets with them. We also conduct joint research and development that may require us to share trade secrets under the terms of our research and development partnerships or similar agreements. We seek to protect our proprietary technology in part by entering into confidentiality agreements and, if applicable, material transfer agreements, consulting agreements or other similar agreements with our advisors, employees, third-party contractors and consultants prior to beginning research or disclosing proprietary information. These agreements typically limit the rights of the third parties to use or disclose our confidential information, including our trade secrets. Despite the contractual provisions employed when working with third parties, the need to share trade secrets and other confidential information increases the risk that such trade secrets

become known by our competitors, are inadvertently incorporated into the technology of others or are disclosed or used in violation of these agreements. Given that our proprietary position is based, in part, on our know-how and trade secrets, a competitor's discovery of our trade secrets or other unauthorized use or disclosure would impair our competitive position and may have an adverse effect on our business and results of operations. Further, disputes may arise under these agreements regarding inventorship or ownership of proprietary information generated during research and development.

In addition, these agreements typically restrict the ability of our advisors, employees, third-party contractors and consultants to publish data potentially relating to our trade secrets, although our agreements may contain certain limited publication rights. Despite our efforts to protect our trade secrets, our competitors may discover our trade secrets, either through breach of our agreements with third parties, independent development or publication of information by any of our third-party collaborators. A competitor's discovery of our trade secrets would impair our competitive position and have an adverse impact on our business.

We may be subject to claims that our employees, consultants or independent contractors have wrongfully used or disclosed confidential information of their former employers or other third parties.

We employ individuals who were previously employed at other biotechnology or pharmaceutical companies. Although we seek to protect our ownership of intellectual property rights by ensuring that our agreements with our employees, collaborators and other third parties with whom we do business include provisions requiring such parties to assign rights in inventions to us, we may be subject to claims that we or our employees, consultants or independent contractors have inadvertently or otherwise used or disclosed confidential information of our employees' former employers or other third parties. We may also be subject to claims that former employers or other third parties have an ownership interest in our patents. Litigation may be necessary to defend against these claims. There is no guarantee of success in defending these claims, and if we fail in defending any such claims, in addition to paying monetary damages, we may lose valuable intellectual property rights, such as exclusive ownership of, or right to use, valuable intellectual property. Even if we are successful, litigation could result in substantial cost and be a distraction to our management and other employees.

Risks Related to Ownership of Our Common Stock

The price of our stock may be volatile, and the value of our common stock may decline.

The market price of our common stock may be highly volatile and could be subject to wide fluctuations in response to various factors, some of which are beyond our control, including limited trading volume. In addition to the factors discussed in this "Risk Factors" section and elsewhere in this Annual Report on Form 10-K, these factors include, but are not limited to:

- the commencement, enrollment or results of our planned or future preclinical studies or clinical trials of our vaccine candidates and those of our competitors;
- regulatory or legal developments in the United States and abroad;
- the success of competitive vaccines or technologies;
- developments or disputes concerning patent applications, issued patents or other proprietary rights;
- the level of expenses related to our vaccine candidates or preclinical and clinical development programs;
- the results of our efforts to develop additional vaccine candidates;
- actual or anticipated changes in estimates as to financial results, development timelines or recommendations or reports by securities analysts;
- the level of expenses and capital investment related to manufacturing our vaccine candidates;
- our inability to obtain or delays in obtaining adequate supply for any approved vaccine candidate;
- significant lawsuits, including patent or stockholder litigation;

- variations in our financial results or those of companies perceived to be similar to us;
- changes in the structure of healthcare payment systems, including coverage and adequate reimbursement for any approved vaccine;
- general economic, political and market conditions, including high inflation rates, bank failures, changes in interest rates, government tapering policies and the conflicts in Ukraine and the Middle East, and overall fluctuations in the financial markets in the United States and abroad; and
- investors' general perception of us and our business.

In addition, the stock market in general, and the Nasdaq Global Select Market and biopharmaceutical companies in particular, have experienced extreme price and volume fluctuations that have often been unrelated or disproportionate to the operating performance of these companies. Broad market and industry factors may negatively affect the market price of our common stock, regardless of our actual operating performance. In the past, securities class action litigation has often been instituted against companies following periods of volatility in the market price of a company's securities. You may not realize any return on your investment in us and may lose some or all of your investment. In the past, securities class action litigation has often been instituted against companies following periods of volatility in the market price of a company's securities. This type of litigation, if instituted, could result in substantial costs and a diversion of management's attention and resources, which would harm our business, operating results or financial condition.

We do not intend to pay dividends on our common stock so any returns will be limited to the value of our stock.

We currently anticipate that we will retain future earnings for the development, operation and expansion of our business and do not anticipate declaring or paying any cash dividends for the foreseeable future. Any return to stockholders will therefore be limited to the appreciation of their stock.

Expectations relating to environmental, social and governance programs may impose additional costs and expose us to new risks.

There is an increasing focus from certain investors and other key stakeholders concerning corporate responsibility, specifically related to environmental, social and governance ("ESG") factors. As a result, there is an increased emphasis on corporate responsibility ratings and a number of third parties provide reports on companies in order to measure and assess corporate responsibility performance. In addition, the ESG factors by which companies' corporate responsibility practices are assessed may change, which could result in greater expectations of us and cause us to undertake costly initiatives to satisfy such new criteria. Alternatively, if we are unable to satisfy such new criteria, investors may conclude that our policies with respect to corporate responsibility are inadequate. We risk damage to our brand and reputation if our corporate responsibility procedures or standards do not meet the standards set by various constituencies. We may be required to make investments in matters related to ESG, which could be significant and adversely impact our results of operations. Furthermore, if our competitors' corporate responsibility performance is perceived to be greater than ours, potential or current investors may elect to invest with our competitors instead. In addition, if we communicate certain initiatives and goals regarding ESG matters, we could fail, or be perceived to fail, in our achievement of such initiatives or goals, or we could be criticized for the scope of such initiatives or goals. If we fail to satisfy the expectations of investors and other key stakeholders or our initiatives are not executed as planned, our reputation and financial results could be materially and adversely affected.

Future sales of a substantial number of shares of our common stock, or the perception that such sales could occur, could cause our stock price to fall.

Sales of a substantial number of shares of our common stock in the public market could occur at any time. These sales, or the public's perception that such sales could occur, could have an adverse effect on the market price of our common stock.

Provisions in our corporate charter documents and under Delaware law could make an acquisition of us, which may be beneficial to our stockholders, more difficult and may prevent attempts by our stockholders to replace or remove our current management.

Provisions in our amended and restated certificate of incorporation and amended and restated bylaws may discourage, delay or prevent a merger, acquisition or other change in control of us that stockholders may consider favorable, including transactions in which you might otherwise receive a premium for your shares. These provisions also could limit the price that investors might be willing to pay in the future for shares of our common stock, thereby depressing the market price of our common stock. In addition, because our board of directors, or Board, is responsible for appointing the members of our management team, these provisions may frustrate or prevent any attempts by our stockholders to replace or remove our current management by making it more difficult for stockholders to replace members of our Board. Among other things, these provisions:

- establish a classified Board such that not all members of the Board are elected at one time;
- allow the authorized number of our directors to be changed only by resolution of our Board;
- limit the manner in which stockholders can remove directors from the Board;
- establish advance notice requirements for stockholder proposals that can be acted on at stockholder meetings and nominations to our Board;
- require that stockholder actions must be effected at a duly called stockholder meeting and prohibit actions by our stockholders by written consent;
- prohibit our stockholders from calling a special meeting of our stockholders;
- authorize our Board to issue preferred stock without stockholder approval, which could be used to institute a stockholder rights plan, or so-called "poison pill," that would work to dilute the stock ownership of a potential hostile acquirer, effectively preventing acquisitions that have not been approved by our Board; and
- require the approval of the holders of at least 66 $^{2}/_{3}$% of the votes that all our stockholders would be entitled to cast to amend or repeal certain provisions of our charter or bylaws.

Moreover, because we are incorporated in Delaware, we are governed by the provisions of Section 203 of the Delaware General Corporation Law ("DGCL"), which prohibits a person who owns 15% or more of our outstanding voting stock from merging or combining with us for a period of three years after the date of the transaction in which the person acquired 15% or more of our outstanding voting stock, unless the merger or combination is approved in a prescribed manner. These provisions could discourage potential acquisition proposals and could delay or prevent a change in control transaction. They could also have the effect of discouraging others from making tender offers for our common stock, including transactions that may be in your best interests. These provisions may also prevent changes in our management or limit the price that investors are willing to pay for our stock.

Claims for indemnification by our directors and officers may reduce our available funds to satisfy successful third-party claims against us and may reduce the amount of money available to us.

Our amended and restated certificate of incorporation and amended and restated bylaws provide that we will indemnify our directors and officers, in each case, to the fullest extent permitted by Delaware law. Delaware law provides that directors of a corporation will not be personally liable for monetary damages for any breach of fiduciary duties as directors, except liability for:

- any breach of the director's duty of loyalty to the corporation or its stockholders;
- any act or omission not in good faith or that involves intentional misconduct or a knowing violation of law;
- unlawful payments of dividends or unlawful stock repurchases or redemptions; or
- any transaction from which the director derived an improper personal benefit.

Such limitation of liability does not apply to liabilities arising under federal securities laws and does not affect the availability of equitable remedies such as injunctive relief or rescission.

Our amended and restated bylaws provide that we are required to indemnify our directors and officers to the fullest extent permitted by Delaware law and may indemnify our other employees and agents. Our amended and restated bylaws also provide that, on satisfaction of certain conditions, we will advance expenses incurred by a director or officer in advance of the final disposition of any action or proceeding, and permit us to secure insurance on behalf of any officer, director, employee or other agent for any liability arising out of his or her actions in that capacity regardless of whether we would otherwise be permitted to indemnify him or her under the provisions of Delaware law. We have entered and expect to continue to enter into agreements to indemnify our directors and executive officers. With certain exceptions, these agreements provide for indemnification for related expenses, including attorneys' fees, judgments, fines and settlement amounts incurred by any of these individuals in connection with any action, proceeding or investigation. We believe that these amended and restated certificate of incorporation and amended and restated bylaws provisions and indemnification agreements are necessary to attract and retain qualified persons as directors and officers.

While we maintain directors' and officers' liability insurance, such insurance may not be adequate to cover all liabilities that we may incur, which may reduce our available funds to satisfy third-party claims and may adversely impact our cash position.

Our amended and restated certificate of incorporation provides that the Court of Chancery of the State of Delaware will, to the fullest extent permitted by applicable law, be the exclusive forum for substantially all disputes between us and our stockholders, which could limit our stockholders' ability to obtain a favorable judicial forum for disputes with us or our directors, officers or employees.

Our amended and restated certificate of incorporation provides that the Court of Chancery of the State of Delaware (or, in the event that the Court of Chancery does not have jurisdiction, the federal district court for the District of Delaware or other state courts of the State of Delaware), to the fullest extent permitted by applicable law, is the exclusive forum for the following types of actions or proceedings under Delaware statutory or common law:

- any derivative action or proceeding brought on our behalf;
- any action or proceeding asserting a claim of breach of a fiduciary duty owed by any of our current or former directors, officers or other employees to us or our stockholders;
- any action or proceeding asserting a claim against us or any of our current or former directors, officers or other employees, arising out of or pursuant to any provision of the DGCL, our certificate of incorporation or our bylaws;
- any action or proceeding to interpret, apply, enforce or determine the validity of our certificate of incorporation or our bylaws; and
- any action or proceeding asserting a claim against us by any of our directors, officers or other employees governed by the internal affairs doctrine.

This provision would not apply to suits brought to enforce a duty or liability created by the Exchange Act. Furthermore, Section 22 of the Securities Act of 1933 (as amended, the "Securities Act") creates concurrent jurisdiction for federal and state courts over all such Securities Act actions. Accordingly, both state and federal courts have jurisdiction to entertain such claims. To prevent having to litigate claims in multiple jurisdictions and the threat of inconsistent or contrary rulings by different courts, among other considerations, our amended and restated certificate of incorporation provides that the federal district courts of the United States will be the exclusive forum for resolving any complaint asserting a cause of action arising under the Securities Act. While the Delaware courts have determined that such choice of forum provisions are facially valid, a stockholder may nevertheless seek to bring a claim in a venue other than those designated in the exclusive forum provisions. In such instance, we would expect to vigorously assert the validity and enforceability of the exclusive forum provisions of our amended and restated certificate of incorporation. This may require significant additional costs associated with resolving such

action in other jurisdictions and there can be no assurance that the provisions will be enforced by a court in those other jurisdictions.

These exclusive-forum provisions may limit a stockholder's ability to bring a claim in a judicial forum that it finds favorable for disputes with us or our directors, officers or other employees, which may discourage these types of lawsuits. If a court were to find the exclusive-forum provision contained in our amended and restated certificate of incorporation to be inapplicable or unenforceable in an action, we may incur additional costs associated with resolving such action in other jurisdictions, which could harm our business.

General Risk Factors

Raising additional capital may cause dilution to our stockholders, restrict our operations or require us to relinquish rights to our technologies or vaccine candidates.

We may seek additional capital through a combination of public and private equity offerings, debt financings, strategic partnerships and alliances and licensing arrangements, including through the use of our "at-the-market" facility. To the extent that we raise additional capital through the sale of equity or convertible debt securities, your ownership interest will be diluted, and the terms may include liquidation or other preferences that adversely affect your rights as a stockholder. The incurrence of indebtedness would result in increased fixed payment obligations and could involve certain restrictive covenants, such as limitations on our ability to incur additional debt, limitations on our ability to acquire or license intellectual property rights and other operating restrictions that could adversely impact our ability to conduct our business. If we raise additional funds through strategic partnerships and alliances and licensing arrangements with third parties, we may have to relinquish valuable rights to our technologies or vaccine candidates, or grant licenses on terms unfavorable to us.

Unstable market and economic conditions may have serious adverse consequences on our business, financial condition and stock price.

The global credit and financial markets have experienced extreme volatility and disruptions in the past several years, including as a result worsening global economic conditions, including higher inflation rates and changes in interest rates, and civil and political unrest in certain countries and regions. Such volatility and disruptions have caused and may continue to cause severely diminished liquidity and credit availability, declines in consumer confidence, declines in economic growth, increases in unemployment rates and uncertainty about economic stability. There can be no assurance that further deterioration in credit and financial markets and confidence in economic conditions will not occur. Our general business strategy may be adversely affected by any such economic downturn, including higher inflation rates and changes in interest rates, volatile business environment or continued unpredictable and unstable market conditions. If the current equity and credit markets deteriorate, it may make any necessary debt or equity financing more difficult, more costly and more dilutive. Failure to secure any necessary financing in a timely manner and on favorable terms could have a material adverse effect on our growth strategy, financial performance and stock price and could require us to delay or abandon clinical development plans. In addition, there is a risk that one or more of our current service providers, manufacturers and other partners may not survive an economic downturn, which could directly affect our ability to attain our operating goals on schedule and on budget.

The cash and cash equivalents that we use to meet our working capital and operating expense needs and investments we hold are held and managed with financial institutions. If any of the financial institutions in which we hold such funds fails or is subject to significant adverse conditions in the financial or credit markets, we could be subject to a risk of loss of all or a portion of such uninsured funds or be subject to a delay in accessing all or a portion of such uninsured funds. Any such loss or lack of access to these funds could adversely impact our short-term liquidity and ability to meet our operating expense obligations. For example, on March 10, 2023, the California Department of Financial Protection and Innovation took control of Silicon Valley Bank ("SVB") and appointed the Federal Deposit Insurance Corporation ("FDIC") as receiver. While SVB was our primary bank at the time, we maintained banking relationships with other major banks. The substantial majority of funds we held at SVB, which included cash, cash equivalents and investments were held in custodial accounts of a third-party institution for which SVB Asset Management was the advisor ("SVB Custodial Accounts"). On March 12, 2023, the FDIC confirmed

that depositors of SVB would have access to all of their money and, as a result, we regained access to all of our funds deposited with SVB. The FDIC subsequently transferred SVB's deposits and loans to a newly created bridge bank, named Silicon Valley Bridge Bank, N.A. ("Silicon Valley Bridge Bank"). On March 26, 2023, the FDIC announced that First Citizens Bank & Trust Company ("First Citizens Bank") had agreed to purchase and assume all deposits and loans of Silicon Valley Bridge Bank. We have not experienced any losses on these deposits or investments as a result of this market event. We continue to maintain a banking relationship with SVB, which is almost entirely comprised of our funds held in SVB Custodial Accounts. While we were able to recover all deposited amounts from SVB, and continue to have access to all investments held in the SVB Custodial Accounts, there can be no assurance that our current or future banks will not face similar risks as SVB or that we will be able to recover in full our deposits in the event of similar closures. If one or any of the financial institutions in which we hold our funds for working capital and operating expense needs were to fail, we cannot provide any assurances that such governmental agencies would take action to protect our uninsured deposits in a similar manner.

Our financial condition and results of operations may fluctuate from quarter to quarter and year to year, which makes them difficult to predict.

We expect our financial condition and results of operations to fluctuate from quarter to quarter and year to year due to a variety of factors, many of which are beyond our control. Accordingly, you should not rely upon the results of any quarterly or annual periods as indications of future operating performance.

If we fail to maintain proper and effective internal control over financial reporting, our ability to produce accurate and timely financial statements could be impaired, investors may lose confidence in our financial reporting and the trading price of our common stock may decline.

Pursuant to Section 404 of the Sarbanes-Oxley Act, we are required to include an attestation report on internal control over financial reporting issued by our independent registered public accounting firm with our annual reports on Form 10-K. The rules governing the standards that must be met for management to assess our internal control over financial reporting are complex and require significant documentation, testing and possible remediation. To comply with the Sarbanes-Oxley Act, the requirements of being a reporting company under the Exchange Act and any complex accounting rules in the future, we may need to upgrade our information technology systems, implement additional financial and management controls, reporting systems and procedures, and hire additional accounting and finance staff. We are currently in the process of hiring additional accounting and finance staff as we grow our business. If we are unable to hire the additional accounting and finance staff necessary to comply with these requirements, we may need to retain additional outside consultants. If we or, if required, our auditors, are unable to conclude that our internal control over financial reporting is effective, investors may lose confidence in our financial reporting and the trading price of our common stock may decline.

There can be no assurance that there will not be material weaknesses in our internal control over financial reporting in the future. Any failure to maintain internal control over financial reporting could severely inhibit our ability to accurately report our financial condition, results of operations or cash flows. If we are unable to conclude that our internal control over financial reporting is effective, or if our independent registered public accounting firm determines that we have a material weakness in our internal control over financial reporting, investors may lose confidence in the accuracy and completeness of our financial reports, the market price of our common stock could decline and we could be subject to sanctions or investigations by Nasdaq, the SEC or other regulatory authorities. Failure to remedy any material weakness in our internal control over financial reporting, or to implement or maintain other effective control systems required of public companies, could also restrict our future access to the capital markets.

Our reported financial results may be adversely affected by changes in accounting principles generally accepted in the United States.

Generally accepted accounting principles in the United States are subject to interpretation by the Financial Accounting Standards Board, the SEC and various bodies formed to promulgate and interpret appropriate accounting principles. A change in these principles or interpretations could have a significant effect on our reported financial results, may retroactively affect previously reported results, could cause unexpected financial reporting fluctuations and may require us to make costly changes to our operational processes and accounting systems.

Our disclosure controls and procedures may not prevent or detect all errors or acts of fraud.

We designed our disclosure controls and procedures to reasonably assure that information we must disclose in reports we file or submit under the Exchange Act is accumulated and communicated to management, and recorded, processed, summarized and reported within the time periods specified in the rules and forms of the SEC. We believe that any disclosure controls and procedures or internal controls and procedures, no matter how well-conceived and operated, can provide only reasonable, not absolute, assurance that the objectives of the control system are met.

These inherent limitations include the realities that judgments in decision-making can be faulty, and that breakdowns can occur because of simple error or mistake. Additionally, controls can be circumvented by the individual acts of some persons, by collusion of two or more people or by an unauthorized override of the controls. Accordingly, because of the inherent limitations in our control system, misstatements due to error or fraud may occur and not be detected.

If securities or industry analysts do not publish research or publish inaccurate or unfavorable research about our business, our stock price and trading volume could decline.

The trading market for our common stock depends in part on the research and reports that securities or industry analysts publish about us or our business. We do not have control over these analysts. If securities or industry analysts do not publish research or reports about our business, the trading price for our stock would likely be negatively impacted. If one or more of the analysts who cover us downgrades our stock or publishes inaccurate or unfavorable research about our business, our stock price may decline. If one or more of these analysts ceases coverage of our company or fails to publish reports on us regularly, demand for our stock could decrease, which might cause our stock price and trading volume to decline.

Item 1B. Unresolved Staff Comments.

None.

Item 1C. Cybersecurity

Cybersecurity Risk Management and Strategy

We have implemented and maintain various information security processes designed to identify, assess and manage material risks from cybersecurity threats to our critical computer networks, third party hosted services, communications systems, hardware and software, and our critical data, including intellectual property, confidential information that is proprietary, strategic or competitive in nature, and data related to our clinical trials("Information Systems and Data").

Our information security function, overseen by our Vice President of IT and Facilities ("VP of IT and Facilities") and supported by members of our IT, Legal and Finance departments, and our third-party IT service providers, helps identify, assess and manage the Company's cybersecurity threats and risks. This group identifies and assesses risks from cybersecurity threats by monitoring and evaluating our threat environment using various methods including, for example: using manual and automated monitoring tools; subscribing to reports and services that identify cybersecurity threats; conducting scans of our threat environment; evaluating threats reported to us; conducting internal and external audits for certain data and systems; conducting threat assessments for internal and external threats; conducting vulnerability assessments to identify vulnerabilities; penetration testing; and having third parties conduct threat assessments.

Depending on the environment, we implement and maintain various technical, physical, and organizational measures, processes, standards and policies designed to manage and mitigate material risks from cybersecurity threats to our Information Systems and Data, including, for example: maintaining an incident response process; conducting risk assessments; encrypting certain of our data; segregating certain of our data; implementing network security controls; maintaining access and physical security controls; asset management processes for managing, tracking, and disposing of assets; monitoring our corporate systems; providing security awareness training to employees; and maintaining cybersecurity insurance.

Our assessment and management of material risks from cybersecurity threats are integrated into the Company's overall risk management processes. For example, our senior management evaluates material risks from cybersecurity threats against our overall business objectives and reports to the audit committee of the board of directors, which evaluates our cybersecurity risks.

We use third-party service providers to assist us from time to time to identify, assess, and manage material risks from cybersecurity threats, including, for example, cybersecurity consultants, cybersecurity software and hardware providers, outside legal counsel, penetration testing firms, dark web monitoring services, and forensic investigators.

We use third-party service providers to perform a variety of functions throughout our business, such as application providers, hosting companies, contract research organizations, and contract manufacturing organizations. We use certain vendor management processes to help manage cybersecurity risks associated with our use of certain of these providers. Depending on the nature of the services provided, the sensitivity of the Information Systems and Data at issue, and the identity of the provider, our vendor management process may involve different levels of assessment designed to help identify cybersecurity risks associated with a provider and impose contractual obligations related to cybersecurity on the provider, including, for example, requiring our vendors to complete security questionnaires and conducting vulnerability scans related to our vendors' services.

For a description of the risks from cybersecurity threats that may materially affect the Company and how they may do so, see our risk factors under Part 1. Item 1A. Risk Factors in this Annual Report on Form 10-K, including *"If our information technology systems or those of the third parties upon which we rely, are or were compromised, we could experience adverse consequences resulting from such compromise, including but not*

limited to significant fines or other liability; regulatory investigations or actions; disruptions of our development programs or business operations; harms to our reputation, and other adverse consequences."

Cybersecurity Governance

Our board of directors addresses the Company's cybersecurity risk management as part of its general oversight function. The board of directors' audit committee is responsible for overseeing Company's cybersecurity risk management processes, including oversight and mitigation of risks from cybersecurity threats.

Our cybersecurity risk assessment and management processes are implemented and maintained by certain individuals in Company management, including our VP of IT and Facilities, who has over 25 years of IT experience, including 10 years of information security experience, in various IT leadership roles in life sciences companies.

Our VP of IT and Facilities is responsible for hiring appropriate personnel, helping to integrate cybersecurity risk considerations into the Company's overall risk management strategy, and communicating key priorities to relevant personnel.

Our VP of IT and Facilities is responsible for preparing budgets, helping prepare for cybersecurity incidents, approving cybersecurity processes, and reviewing security assessments and other security-related reports.

Our cybersecurity incident response processes are designed to escalate certain cybersecurity incidents and vulnerabilities to members of management depending on the circumstances, including our President and CFO. Our President and CFO works with the Company's incident response team to help the Company mitigate and remediate cybersecurity incidents of which they are notified. In addition, the Company's incident response processes include reporting to the audit committee of the board of directors for certain cybersecurity incidents.

The audit committee receives quarterly reports from our VP of IT and Facilities concerning the Company's significant cybersecurity threats and risk and the processes the Company has implemented to address them. The audit committee also has access to various reports, summaries or presentations related to cybersecurity threats, risk and mitigation.

Item 2. Properties.

Our corporate headquarters is located at 825 Industrial Road, Suite 300, San Carlos, California 94070 ("Corporate Headquarters"), where we lease and occupy 77,498 square feet of laboratory and office space. In September 2023, we entered into an assignment and assumption of lease agreement for an additional operating lease in the same building as our Corporate Headquarter (the "Assumed Lease Premises"). Our Assumed Lease premises consist of an aggregate of approximately 36,593 square feet of laboratory and office space in that we lease and occupy. Our lease for our Corporate Headquarters expires on December 31, 2025 and our lease for the Assumed Lease Premises expires on November 30, 2031. We use our Corporate Headquarters and Assumed Lease Premises primarily for corporate research, development, regulatory, manufacturing and quality functions. We believe that our existing facilities are adequate to meet our current needs.

Item 3. Legal Proceedings.

From time to time we may become involved in legal proceedings or be subject to claims arising in the ordinary course of our business. We are not presently a party to any legal proceedings that in the opinion of our management, if determined unfavorably to us, would have a material adverse effect on our business, financial condition, operating results or cash flows. Regardless of the outcome, litigation can, among other things, be time consuming and expensive to resolve and divert management resources.

Item 4. Mine Safety Disclosures.

Not applicable.

PART II

Item 5. Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities.

Market Information for Our Common Stock

Our common stock commenced trading on the Nasdaq Global Select Market under the symbol "PCVX" on June 12, 2020.

Holders

As of February 23, 2024, there were approximately 11 holders of record of our common stock. The actual number of stockholders is greater than this number of record holders, and includes stockholders who are beneficial owners, but whose shares are held in street name by brokers and other nominees. This number of holders of record also does not include stockholders whose shares may be held in trust by other entities.

Dividend Policy

We have not declared or paid any cash dividend on our common stock. We intend to retain any future earnings and do not expect to pay cash dividends in the foreseeable future. Payment of cash dividends, if any, in the future will be at the discretion of our board of directors (our "Board") and will depend on then-existing conditions, including our financial condition, operating results, contractual restrictions, capital requirements, business prospects and other factors our Board may deem relevant.

Securities Authorized for Issuance under Equity Compensation Plans

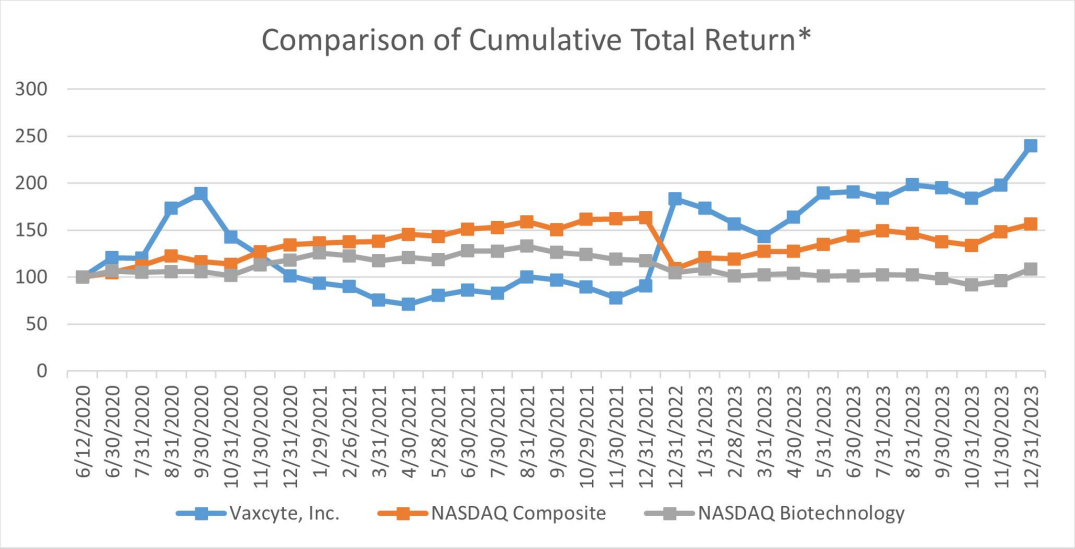
Information about our equity compensation plans is incorporated herein by reference to Item 12 of Part III of this Annual Report on Form 10-K.

Stock Performance Graph

This performance graph shall not be deemed "soliciting material" or to be "filed" with the SEC for purposes of Section 18 of the Exchange Act or otherwise subject to the liabilities under that Section, and shall not be deemed to be incorporated by reference into any of our filings under the Securities Act, except to the extent that we specifically incorporate this information by reference therein, whether made before or after the date hereof and irrespective of any general incorporation language in any such filing.

The following stock performance graph compares our cumulative total stock return relative to the cumulative total returns of the Nasdaq Composite Index and the Nasdaq Biotechnology Index for the period from June 12, 2020 (the date our common stock commenced trading on the Nasdaq Global Select Market) through December 31, 2023. The figures below assume an investment of $100 in our common stock at the closing price of $26.15 on June 12, 2020, the date of our IPO, and in each index on the same date and the reinvestment of the full amount of all dividends into shares of common stock; however, no dividends have been declared on our common

stock to date. The stockholder returns shown on the graph below are based on historical results and are not indicative of future performance, and we do not make or endorse any predictions as to future stockholder returns.



Unregistered Sales of Equity Securities

None.

Purchases of Equity Securities by the Issuer and Affiliated Purchasers

None.

Item 6. [Reserved]

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations.

The following discussion and analysis of our financial condition and results of operations should be read in conjunction with our consolidated financial statements and related notes and other financial information included elsewhere in this Annual Report on Form 10-K. This discussion and analysis contain forward-looking statements based upon our current beliefs, plans and expectations that involve risks, uncertainties and assumptions, such as statements regarding our plans, objectives, expectations, intentions and beliefs. Our actual results and the timing of events could differ materially from those anticipated in these forward-looking statements as a result of various factors, including those set forth under the section titled "Risk Factors" and elsewhere in this Annual Report on Form 10-K. You should carefully read the "Risk Factors" section of this Annual Report on Form 10-K to gain an understanding of the important factors that could cause actual results to differ materially from our forward-looking statements. Please also see the section titled "Special Note Regarding Forward-Looking Statements."

Overview

We are a clinical-stage vaccine innovation company engineering high-fidelity vaccines to protect humankind from the consequences of bacterial diseases. We are developing broad-spectrum conjugate and novel protein vaccines to prevent or treat bacterial infectious diseases. We are re-engineering the way highly complex vaccines are made through modern synthetic techniques, including advanced chemistry and the XpressCF™ cell-free protein synthesis platform, exclusively licensed from Sutro Biopharma, Inc. ("Sutro Biopharma"). Unlike conventional cell-based approaches, our system for producing difficult-to-make proteins and antigens is intended to accelerate our ability to efficiently create and deliver high-fidelity vaccines with enhanced immunological benefits.

Our pipeline includes:

- Pneumococcal conjugate vaccine ("PCV") candidates that we believe are among the most broad-spectrum PCV candidates currently in development, targeting the approximately $8 billion global pneumococcal vaccine market. Pneumococcal disease is an infection caused by *Streptococcus pneumoniae* ("pneumococcus") bacteria. It can result in invasive pneumococcal disease ("IPD"), including meningitis and bacteremia, and non-invasive pneumococcal disease, including pneumonia, otitis media and sinusitis. Our broad-spectrum, carrier-sparing PCV candidates, VAX-24 and VAX-31, are designed to improve upon the standard-of-care PCVs for both children and adults by covering the serotypes that are responsible for a significant portion of IPD in circulation and are associated with high case-fatality rates, antibiotic resistance and meningitis, while maintaining coverage of previously circulating strains that are currently contained through continued vaccination practice.
    - Our lead vaccine candidate, VAX-24, is a 24-valent, broad-spectrum, carrier-sparing investigational PCV being developed for the prevention of IPD.
        - VAX-24 Adult Indication:
            - In October 2022, we announced positive topline results from both the Phase 1 and Phase 2 portions of a clinical proof-of-concept study evaluating the safety, tolerability and immunogenicity of VAX-24 in 835 healthy adults aged 18-64. The Phase 1 portion of the study evaluated the safety and tolerability of a single injection of VAX-24 at three dose levels, 1.1mcg, 2.2mcg and 2.2mcg/4.4mcg, and compared to Prevnar 20® ("PCV20") in 64 healthy adults aged 18-49. The Phase 2 portion evaluated the safety, tolerability and immunogenicity of a single injection of VAX-24 at the same three dose levels and compared to a single injection of PCV20 in 771 healthy adults aged 50-64. In this study, VAX-24 met the primary safety and tolerability objectives, demonstrating a safety profile similar to PCV20, for all doses studied. In the study, VAX-24 met or exceeded the established regulatory immunogenicity standards for all 24 serotypes at the conventional 2.2mcg dose, which is the dose selected for a potential Phase 3 program. At this dose, VAX-24 met the standard opsonophagocytic activity ("OPA") response non-inferiority criteria for all 20 serotypes common with PCV20, of which 16 achieved higher immune responses. Additionally, at all three doses, VAX-24 met the standard superiority criteria for all four serotypes unique to

VAX-24. VAX-24 has the potential to cover an additional 14-26 percent of strains causing IPD in adults over the current standard-of-care PCVs.

- In April 2023, we announced positive results from a Phase 2 study of VAX-24 in adults aged 65 and older, as well as data from the full six-month safety assessment and prespecified pooled immunogenicity analyses from both the Phase 2 study in adults aged 65 and older and the prior Phase 1/2 study in adults aged 18-64. The Phase 2 study in adults aged 65 and older evaluated the safety, tolerability and immunogenicity of a single injection of VAX-24 at three dose levels, 1.1mcg, 2.2mcg and 2.2mcg/4.4mcg, and compared to a single injection of PCV20 in 207 healthy adults aged 65 and older. In this Phase 2 study, VAX-24 demonstrated robust OPA immune responses across all 24 serotypes at all doses studied, confirming the prior Phase 2 adult study results. The VAX-24 2.2mcg dose, which is the dose selected for a potential Phase 3 program, showed an overall improvement in immune responses compared to PCV20 relative to the results from the prior Phase 2 study in adults aged 50-64. The six-month safety data from both adult studies showed safety and tolerability results for VAX-24 similar to PCV20 at all doses studied. Additionally, the prespecified pooled immunogenicity analyses of data from both adult Phase 2 studies showed the VAX-24 2.2mcg dose met the OPA non-inferiority criteria for all 20 serotypes common with PCV20 and the superiority criteria for the four additional serotypes unique to VAX-24.
- The U.S. Food and Drug Administration ("FDA") has granted Fast Track designation and Breakthrough Therapy designation for VAX-24 in adults.
- In October 2023, we completed a successful End-of-Phase 2 meeting with the FDA. The meeting focused on the VAX-24 adult Phase 3 clinical program, including the design of the pivotal, non-inferiority study and other Phase 3 studies needed to support a Biologics License Application ("BLA") submission. Based on the End-of-Phase 2 meeting, we believe there is agreement with the FDA on the clinical design of a potential adult Phase 3 program, including the approximate overall number of subjects, the primary and secondary endpoints for the pivotal, non-inferiority study as well as confirmation that the planned immunogenicity analyses are sufficient to support licensure and a separate efficacy study is therefore not required.
- In January 2024, we announced that we received encouraging input from ongoing discussions with the FDA about the VAX-24 adult program to further inform our chemistry, manufacturing and controls ("CMC") licensure requirements and that we expect to seek additional CMC-focused input from the FDA as we prepare for and potentially conduct our VAX-24 adult Phase 3 program. Following the topline data from the VAX-31 adult Phase 1/2 study, which is expected in the third quarter of 2024, we expect to determine whether to advance VAX-24 or VAX-31 to an adult Phase 3 program. If we move forward with the VAX-24 adult Phase 3 program, we expect to initiate the pivotal, non-inferiority study in adults aged 50 and older in the second half of 2024 and announce topline safety, tolerability and immunogenicity data from this study in the second half of 2025. We would expect to initiate the remaining Phase 3 studies, which are shorter in duration than the non-inferiority study, for VAX-24 in the adult population in 2025 and 2026. If we move forward with the VAX-31 adult Phase 3 program, we expect to initiate the full complement of potential Phase 3 studies in 2025 and 2026. Subject to the results of the adult Phase 3 studies, we would expect to submit a BLA for VAX-24 or VAX-31 shortly following the completion of the last Phase 3 study.

▪ VAX-24 Pediatric Indication:

- In March 2023, we announced that the first participants were dosed in the first stage of a Phase 2 study of VAX-24 in healthy infants. The Phase 2 infant study is being conducted in two stages and compares VAX-24 to the broadest-spectrum

standard-of-care PCVs currently available. Stage 1 of the study evaluated the safety and tolerability of a single injection of VAX-24 at three dose levels, 1.1mcg, 2.2mcg and 2.2mcg/4.4mcg, and compared to VAXNEUVANCE™ ("PCV15"), the broadest-spectrum standard-of-care PCV at that time, in 48 infants in a dose-escalation approach.

- In July 2023, we announced that the ongoing Phase 2 study of VAX-24 in healthy infants had advanced to the second and final stage of the study in which we continue to enroll participants. The independent Data Safety Monitoring Board approved advancing to the second stage of the study following the review of the safety and tolerability results from the first stage. Additionally, in agreement with the FDA, we amended the study protocol for Stage 2 of the study, changing the study comparator to PCV20, which became the broadest-spectrum PCV recommended by the Advisory Committee on Immunization Practices in June 2023. This Phase 2 study is evaluating the safety, tolerability and immunogenicity of VAX-24 in healthy infants at the same three dose levels, 1.1mcg, 2.2mcg and 2.2mcg/4.4mcg, that were evaluated in Stage 1. We expect to share topline data from the primary three-dose immunization series of the study by the end of the first quarter of 2025, followed by topline data from the booster dose by the end of 2025.

o Our second PCV candidate, VAX-31, is the broadest-spectrum PCV to enter the clinic. VAX-31 builds on what has been established with VAX-24 and is designed to expand the breadth of coverage to 31 strains, inclusive of the 24 strains in VAX-24, without compromising immunogenicity due to carrier suppression, and to cover approximately 95% of IPD circulating in the U.S. adult population.

- In October 2023, we announced the FDA clearance of the investigational new drug ("IND") application for VAX-31 for the prevention of IPD in adults. In November 2023, we announced that the first participants were dosed in a Phase 1/2 clinical study for VAX-31 in adults. The VAX-31 Phase 1/2 clinical study is a randomized, observer-blind, active-controlled, dose-finding clinical study designed to evaluate the safety, tolerability and immunogenicity of VAX-31 at three dose levels (low, middle and high) and compared to PCV20 in 1,015 healthy adults aged 50 and older. The Phase 1 portion of the study evaluated the safety and tolerability of a single injection of VAX-31 at three dose levels and compared to PCV20 in 64 healthy adults 50 to 64 years of age. An independent Data Monitoring Committee conducted an assessment of the Phase 1 safety and tolerability results and recommended that the study proceed as planned to Phase 2. Phase 1 participants will also be evaluated for immunogenicity, and the Phase 1 safety, tolerability and immunogenicity data will be pooled with the participants in the Phase 2 portion of the study. The Phase 2 portion of the study will evaluate the safety, tolerability and immunogenicity of a single injection of VAX-31 at the same three dose levels and compared to PCV20 in 951 healthy adults 50 years of age and older. Participants were randomized equally in four separate arms and, 30 days after dosing, serology samples will be collected to assess immunogenicity. The immunogenicity objectives of the study include an assessment of the induction of antibody responses, using OPA and immunoglobulin G ("IgG"), at each of the three VAX-31 doses and compared to PCV20 for the 20 serotypes in common, as well as for the additional 11 serotypes contained in VAX-31, but not in PCV20. Participants in the study are being evaluated for safety through six months after vaccination. The study is being conducted at approximately 25 sites in the United States.

- In January 2024, we announced the completion of enrollment in the Phase 1/2 clinical study evaluating VAX-31 in healthy adults aged 50 and older. We expect to announce topline safety, tolerability and immunogenicity data from the Phase 1/2 study in the third quarter of 2024, following which we expect to determine whether to advance VAX-24 or VAX-31 to an adult Phase 3 program as discussed above.

- VAX-A1, a novel conjugate vaccine candidate designed to prevent disease caused by Group A Streptococcus ("Group A Strep"). Group A Strep is pervasive globally and causes an estimated 800

million cases of illness annually, including pharyngitis, or strep throat, and certain severe invasive infections and sequelae. There is currently no vaccine against Group A Strep, which is one of the leading infectious disease-related causes of death and disability worldwide and a significant contributor to the prescription of antibiotics in the very young. We believe we have demonstrated preclinical proof of concept for VAX-A1, the data for which were published in December 2020. We nominated the final vaccine candidate for VAX-A1 in the first quarter of 2021 and initiated IND-enabling activities in the second half of 2021. We continue to advance the development of VAX-A1 and we intend to provide further information about the anticipated timing of an IND application as the program progresses.

- VAX-PG, a novel protein vaccine candidate targeting the keystone pathogen responsible for periodontitis, a chronic oral inflammatory disease affecting an estimated 65 million adults in the United States. We believe we have generally demonstrated preclinical proof of concept for a periodontitis protein vaccine, the data for which was published in February 2019. We nominated a final vaccine candidate for VAX-PG in 2022 and are conducting large-animal confirmatory studies prior to advancing the program to potential IND-enabling activities. Our initial goal is to develop a therapeutic vaccine to slow or stop disease progression; however, the results from clinical trials may inform the potential adoption of prophylactic immunization.
- VAX-GI, a novel preclinical vaccine candidate being developed as a preventative treatment for dysentery and shigellosis, which is caused by Shigella bacteria. Shigella, a bacterial illness that affects an estimated 188 million people worldwide each year and results in approximately 164,000 deaths annually, mostly among children under five years of age in low- and middle-income settings. The central antigen in VAX-GI is IpaB, a well-appreciated antigen that other developers have been unable to produce in an amount sufficient to enable a commercial product. With our cell-free technology, we believe we can produce this antigen at substantially improved yields, allowing for commercial-scale production. VAX-GI is being developed in collaboration with the University of Maryland, Baltimore as well as with partial funding from two research grants awarded by the National Institutes of Health.
- Other discovery-stage programs that leverage our cell-free protein synthesis platform, which, if proven successful in preclinical studies, could also be advanced into IND-enabling activities and clinical studies.

Since January 1, 2023, key developments affecting our business include the following:

- ***Completed Successful $863 Million Follow-On Financing:*** In February 2024, we completed an underwritten public offering of 12,695,312 shares of our common stock, which included the full exercise of the underwriters' option to purchase an additional 1,757,812 shares, at a public offering price of $64.00 per share and pre-funded warrants to purchase 781,250 shares of our common stock at a public offering price of $63.999 per underlying share. The aggregate gross proceeds to us from the offering were approximately $862.5 million, before deducting underwriting discounts and commissions and other estimated offering expenses payable by us, and excluding the exercise of any pre-funded warrants.
- ***Completed Enrollment of Phase 1/2 Study Evaluating VAX-31 for the Prevention of IPD in Adults Aged 50 and Older:*** In January 2024, we announced the completion of enrollment in the Phase 1/2 clinical study evaluating VAX-31 in healthy adults aged 50 and older. The VAX-31 Phase 1/2 clinical study is a randomized, observer-blind, active-controlled, dose-finding study designed to evaluate the safety, tolerability and immunogenicity of VAX-31 at three dose levels (low, middle and high) compared to PCV20 in 1,015 healthy adults aged 50 and older.
- ***VAX-24 Adult Phase 1/2 Proof-of-Concept Data Published in The Lancet Infectious Diseases Highlighting Best-in-Class Potential of VAX-24:*** In December 2023, the results from the VAX-24 Phase 1/2 clinical POC study were published in the journal The Lancet Infectious Diseases.
- ***Exercised Option and Entered into Manufacturing Rights Agreement with Sutro Biopharma to Obtain Control Over Manufacturing and Development of Cell-Free Extract:*** In November 2023, we exercised the option and entered into a manufacturing rights agreement with Sutro Biopharma to obtain control over the development and manufacture of cell-free extract, a key component of our PCV candidates. Pursuant to the manufacturing rights agreement, we obtained

exclusive rights to independently, or through certain third parties, develop, improve and manufacture cell-free extract for use in connection with our vaccine candidates.

- ***Dosed First Participants in Phase 1/2 Clinical Study Evaluating VAX-31 for the Prevention of IPD in Adults:*** In November 2023, following FDA clearance of the IND application, we announced that the first participants were dosed in a Phase 1/2 clinical study for VAX-31 in adults.
- ***Expanded Collaboration with Lonza for Global Commercial Manufacturing of Our PCV Candidates:*** In October 2023, we and Lonza Ltd. ("Lonza") entered into a new commercial manufacturing agreement, expanding our existing collaboration. This agreement supports the potential global commercialization of our PCV candidates in both the adult and pediatric populations and complements our plans to utilize existing Lonza infrastructure to advance clinical development and support the anticipated initial U.S. launch of VAX-24 or VAX-31 for the adult population. Under the terms of the new agreement, Lonza will provide us with a custom-built manufacturing suite as part of Lonza's Ibex® facility in Visp, Switzerland to support the manufacture of key components, including the drug substances, for our PCV franchise.
- ***Completed End-of-Phase 2 Meeting with FDA and Held CMC Regulatory Discussions:*** In October 2023, we completed a successful End-of-Phase 2 meeting with the FDA. The meeting focused on the VAX-24 adult Phase 3 clinical program, including the design of the pivotal, non-inferiority study and other Phase 3 studies needed to support a BLA submission. Based on the End-of-Phase 2 meeting, we believe there is agreement with the FDA on the clinical design of the adult Phase 3 program, including the approximate overall number of subjects, the primary and secondary endpoints for the pivotal, non-inferiority study as well as confirmation that the planned immunogenicity analyses are sufficient to support licensure and an efficacy study is therefore not required. Additionally, as part of ongoing CMC-focused discussions, we received encouraging input from the FDA regarding the VAX-24 adult licensure requirements. We were granted these discussions under the VAX-24 adult Breakthrough Therapy designation and expect to seek additional CMC-focused input from the FDA as we continue to prepare for and potentially conduct the VAX-24 adult Phase 3 program.
- ***Advanced to Second and Final Stage of Phase 2 Study Evaluating VAX-24 for the Prevention of IPD in Infants and Dosed First New Participants:*** In July 2023, we announced that the ongoing Phase 2 study of VAX-24 in healthy infants advanced to the second and final stage of the study. The independent Data Safety Monitoring Board approved advancing to the second stage of the study following the review of the safety and tolerability results from the first stage. New participants began enrolling and dosing in Stage 2 of the study in July 2023. Additionally, in agreement with the FDA, we amended the study protocol for Stage 2, changing the study comparator to PCV20, which is currently the broadest-spectrum PCV recommended by the Advisory Committee on Immunization Practices for infants. Enrollment in the VAX-24 infant Phase 2 study is nearing completion.
- ***Reported Positive Data from Phase 2 Study of VAX-24 in Adults Aged 65 and Older and Full Six-Month Safety Data from Adult Phase 1/2 and Phase 2 Studies:*** In April 2023, we announced positive results from the VAX-24 Phase 2 study in adults aged 65 and older, as well as data from the full six-month safety assessment and prespecified pooled immunogenicity analyses from both the Phase 2 study in adults aged 65 and older and the prior Phase 1/2 proof-of-concept study in adults aged 18-64. (Phase 1 portion included adults aged 18-49 and the Phase 2 portion included adults aged 50-64). In the Phase 2 study in adults aged 65 and older, VAX-24 demonstrated robust OPA immune responses for all 24 serotypes at all doses studied, confirming the prior adult Phase 1/2 proof-of-concept study results. The six-month safety data from both studies showed safety and tolerability results for VAX-24 similar to PCV20 at all doses studied.
- ***Completed Successful $575 Million Follow-On Financing:*** In April 2023, we completed an underwritten public offering of 13,030,000 shares of our common stock, which included the full exercise of the underwriters' option to purchase an additional 1,830,000 shares, at a public offering price of $41.00 per share and pre-funded warrants to purchase 1,000,000 shares of our

common stock at a public offering price of $40.999 per underlying share. The aggregate gross proceeds to us from the offering were $575.2 million, before deducting underwriting discounts and commissions and other estimated offering expenses payable by us, and excluding the exercise of any pre-funded warrants.

- ***Announced New Vaccine Program VAX-GI:*** In February 2023, we announced that we added a new vaccine program, VAX-GI, designed to prevent Shigella, a bacterial illness that affects an estimated 188 million people worldwide each year and results in approximately 164,000 deaths annually, mostly among children under five years of age in low- and middle-income settings.
- ***Announced FDA Clearance of Investigational New Drug Application for VAX-24 for the Prevention of IPD in Infants:*** In late February 2023, we announced that the FDA cleared the VAX-24 IND application for the prevention of IPD in infants.
- ***VAX-24 Granted Breakthrough Therapy Designation from the FDA for the Prevention of IPD in Adults Aged 18 and Older:*** In January 2023, we announced that the FDA granted Breakthrough Therapy designation for VAX-24 for the prevention of IPD in adults. With Breakthrough Therapy designation, we have access to all of the elements of the FDA's Fast Track program, as well as the ability to receive guidance and support from the FDA on an efficient drug development program and an organizational commitment from senior managers within the FDA. The Breakthrough Therapy designation process is designed to expedite the development and review of drugs and biologics that are intended to treat a serious or life-threatening condition, where preliminary clinical evidence indicates that the drug or biologic may demonstrate substantial improvement over existing therapies on one or more clinically significant endpoints.

Since our inception in November 2013, we have devoted substantially all of our resources to performing research and development, undertaking preclinical studies, advancing our vaccine candidates through clinical trials, enabling manufacturing activities in support of our product development efforts, acquiring and developing our technology and vaccine candidates, organizing and staffing our company, performing business planning, establishing our intellectual property portfolio and raising capital to support and expand such activities. We do not have any products approved for sale and have not generated any revenue from product sales. To date, we have financed our operations primarily with proceeds from the sales of our common stock, pre-funded warrants to purchase our common stock and, prior to our initial public offering ("IPO") in June 2020, redeemable convertible preferred stock. We will continue to require additional capital to develop and commercialize our vaccine candidates and fund operations for the foreseeable future. Accordingly, until such time as we can generate significant revenue from sales of our vaccine candidates, if ever, we expect to finance our cash needs through public or private equity or debt financings, third-party (including government) funding and marketing and distribution arrangements, as well as other collaborations, strategic alliances and licensing arrangements, or any combination of these approaches.

We have incurred net losses in each year since inception and expect to continue to incur net losses in the foreseeable future. Our net losses may fluctuate significantly from quarter-to-quarter and year-to-year, depending in large part on the timing of our preclinical studies, clinical trials and manufacturing activities, and our expenditures on other research and development activities. Our net losses were $402.3 million, $223.5 million and $100.1 million for the years ended December 31, 2023, 2022 and 2021, respectively. As of December 31, 2023, we had an accumulated deficit of $924.4 million and cash, cash equivalents and investments of $1,242.9 million. We believe our cash, cash equivalents and investments will be sufficient to fund our operating expenses and capital expenditure requirements through at least 12 months from the filing date of this Annual Report on Form 10-K.

We do not expect to generate any revenue from commercial product sales unless and until we successfully complete development and obtain regulatory approval for one or more of our vaccine candidates, which

we expect will take a number of years. We expect our expenses will increase substantially in connection with our ongoing activities, as we:

- advance our vaccine candidates through preclinical studies and clinical trials;
- progress in the scale-up of our manufacturing capabilities, in particular to prepare for our adult Phase 3 program for VAX-24 or VAX-31, as well as the potential commercial launches of VAX-24 and/or VAX-31;
- incur additional costs that may be required for secondary supply sources;
- require the manufacture of supplies for our clinical trials, in particular our clinical trials for our PCV candidates, VAX-24 and VAX-31;
- pursue regulatory approval of our vaccine candidates;
- establish additional manufacturing capacity to meet potential incremental supply requirements following the potential initial commercial launch of VAX-24 or VAX-31 for adults;
- hire additional personnel;
- acquire, discover, validate and develop additional vaccine candidates; and
- obtain, maintain, expand and protect our intellectual property portfolio.

We rely and will continue to rely on third parties to conduct our preclinical studies and clinical trials and for manufacturing and supply of our vaccine candidates. We have no internal manufacturing capabilities, and we will continue to rely on third parties, of which the main suppliers are single-source suppliers, for our preclinical and clinical trial materials. Given our stage of development, we do not yet have a marketing or sales organization or commercial infrastructure. Accordingly, if we obtain regulatory approval for any of our vaccine candidates, we also would expect to incur significant commercialization expenses related to product sales, marketing, manufacturing and distribution.

Because of the numerous risks and uncertainties associated with vaccine development, we are unable to predict the timing or amount of increased expenses or when or if we will be able to achieve or maintain profitability. Even if we are able to generate revenue from the sale of our vaccines, we may not become profitable. If we fail to become profitable or are unable to sustain profitability on a continuing basis, then we may be unable to continue our operations at planned levels and may be forced to reduce our operations.

Certain Significant Relationships

Lonza

Development and Manufacturing Services Agreements

In April 2022, we entered into a non-exclusive development and manufacturing services agreement with Lonza effective as of March 22, 2022, which was subsequently amended on May 12, 2022, November 21, 2022 and October 31, 2023 (as amended, the "2022 Lonza DMSA"). Pursuant to the 2022 Lonza DMSA, Lonza is obligated to perform services including manufacturing process development and clinical manufacture and supply of our proprietary PCV candidates. Subject to the terms and conditions set forth in the 2022 Lonza DMSA, Lonza has granted to us a non-exclusive, worldwide, fully paid-up, irrevocable, transferable license, including the right to grant sublicenses, under the New General Application Intellectual Property, to research, develop, make, have made, use, sell and import the Product. Unless earlier terminated, the 2022 Lonza DMSA shall remain in place for a period of five years. Either party may terminate the 2022 Lonza DMSA for any reason on prior written notice to the other party, provided that Lonza may not exercise such right until a specified future date. In addition, either party may

terminate the 2022 Lonza DMSA (i) within a given time period upon any material breach that is left uncured by the other party, or (ii) immediately if the other party becomes insolvent. We may also terminate the 2022 Lonza DMSA upon an extended force majeure event. Upon expiration and/or termination of the 2022 Lonza DMSA and/or any purchase order, we will pay Lonza for all service rendered, all costs incurred, all unreimbursed capital equipment and any cancellation fees (each term as defined in the 2022 Lonza DMSA).

In February 2023, we entered into another non-exclusive development and manufacturing services agreement with Lonza, effective as of March 1, 2023 (the "2023 Lonza DMSA"). Pursuant to the 2023 Lonza DMSA, Lonza will perform manufacturing process development and the manufacture of components for VAX-24 and VAX-31, including the polysaccharide antigens, our proprietary eCRM protein carrier and conjugated drug substances. Subject to the terms and conditions set forth in the 2023 Lonza DMSA, Lonza has granted to us a non-exclusive, worldwide, fully paid-up, transferable license, including the right to grant sublicenses (subject to the prior written consent of Lonza), under the New General Application Intellectual Property, to use, sell and import the Product manufactured under the 2023 Lonza DMSA (but no other products). Unless earlier terminated, the 2023 Lonza DMSA shall remain in place for a period of five years and shall automatically renew for one additional two-year period unless either party provides written notice of non-renewal at least two years prior to the fifth anniversary of the effective date. We may terminate the 2023 Lonza DMSA for any reason on prior written notice to the other party on a Project Plan-by-Project Plan basis. Either party may terminate the 2023 Lonza DMSA (i) within a given time period upon any material breach that is left uncured by the other party, (ii) immediately if the other party becomes insolvent, is dissolved or liquidated, makes a general assignment for the benefit of its creditors, or files or has filed against it, a petition in bankruptcy or has a receiver appointed for a substantial part of its assets, (iii) upon an extended force majeure event, or (iv) if it becomes apparent to either party at any stage in the provision of the Services that it will be impossible to complete the Services for scientific or technical reasons despite exercise of best commercial efforts by both parties. Pursuant to the reason for termination and the party initiating the termination, we will pay Lonza for some combination of services rendered, costs incurred, unreimbursed capital equipment and/or any cancellation fees. Upon an extended force majeure event, neither party shall have any further liability to the other party (each term as defined in the 2023 Lonza DMSA).

Under each of the 2022 Lonza DMSA and 2023 Lonza DMSA (collectively, the "Lonza Agreements") we pay Lonza agreed-upon fees for their performance of development and manufacturing services and pass through expenses incurred by Lonza for raw materials, as well as customary procurement and handling fees. Under each Lonza Agreement, we own all rights, title and interest in and to any and all New Customer Intellectual Property (as defined in each Lonza Agreement), and Lonza owns all right, title and interest in New General Application Intellectual Property (as defined in each Lonza Agreement).

Commercial Manufacturing and Supply Agreement

On October 13, 2023, Vaxcyte Switzerland GmbH ("Vaxcyte GmbH"), a Swiss limited liability company and wholly owned subsidiary of ours, entered into a pre-commercial services and commercial manufacturing supply agreement with Lonza (the "Commercial Manufacturing and Supply Agreement").

Pursuant to the Commercial Manufacturing and Supply Agreement, Lonza will (i) construct and build out a dedicated suite (the "Suite") at Lonza's facilities in Visp, Switzerland to manufacture certain key components (including drug substance) for our proprietary PCV franchise and any other products or intermediates Vaxcyte GmbH may choose (collectively, the "Products") and (ii) maintain and operate the Suite (utilizing Lonza's employees) to manufacture the Products as a service provided to Vaxcyte GmbH, including conducting related quality control and quality assurance operations. Lonza will be a preferred, non-exclusive, supplier of the Products to Vaxcyte GmbH, and Vaxcyte GmbH retains the right to procure the Products from one or more alternate and/or backup manufacturers of the Products (including at our own facilities).

Under the Commercial Manufacturing and Supply Agreement, prior to completion of construction and certification of the Suite for commercial operation, Vaxcyte GmbH will contribute to the capital expenditure costs to construct the Suite (and will own certain equipment in the Suite to be purchased or otherwise acquired by Vaxcyte GmbH), and will pay Lonza a fixed-rate monthly service fee for Lonza's pre-commercial services prior to commencement of commercial operations (which monthly service fee amount is subject to increases in subsequent years). Following commencement of commercial operations of the Suite to manufacture the Products, Vaxcyte GmbH will pay Lonza (i) Suite fees based on allocations of certain of Lonza's costs to maintain the facility in which

the Suite is located and to provide shared services to Vaxcyte GmbH and Lonza's other customers in such facility, (ii) service fees based upon Lonza's actual full-time equivalent employee ("FTE") costs to operate the Suite to manufacture the Products, and (iii) certain other pass-through costs, including for raw materials. In addition, Vaxcyte GmbH may be obligated to pay or reimburse Lonza for certain other fees and expenses under the Commercial Manufacturing and Supply Agreement. Lonza will be eligible for certain financial bonuses, and subject to certain financial penalties, as incentives for the timely completion of certain scale-up activities, receipt of certain regulatory approvals for the Suite and manufacture of the Products in accordance with Vaxcyte GmbH's commercial requirements.

Unless earlier terminated, the Commercial Manufacturing and Supply Agreement will remain in effect until December 31, 2038, subject to automatic renewal for up to three additional renewal periods of five years each, unless Vaxcyte GmbH elects not to renew (with 24 months advanced notice to Lonza). Vaxcyte GmbH is permitted to terminate the Commercial Manufacturing and Supply Agreement for convenience or for Lonza's uncured material breach, in each case subject to certain notice obligations. Lonza is permitted to terminate the Commercial Manufacturing and Supply Agreement in the event that Vaxcyte GmbH commits certain specified material breaches, including uncured failure to pay material, undisputed amounts of money due to Lonza, subject to certain notice obligations. Either party may terminate the Commercial Manufacturing and Supply Agreement in certain circumstances in the event of the other party's bankruptcy. In the event that Vaxcyte GmbH terminates the agreement for convenience, or Lonza terminates the agreement in the event that Vaxcyte GmbH commits certain specified material breaches, then certain termination consequences may be triggered, including that (i) Vaxcyte GmbH would forfeit any outstanding entitlement to credit from Lonza of the Repurposing Fee (as defined below), and (ii) Vaxcyte GmbH would be obligated to pay Lonza a termination penalty equal to the greater of (a) CHF 70,000,000, or (b) a prespecified number of months' FTE fees for the actual FTEs assigned to Vaxcyte GmbH as of the date of termination. Within 30 days of the Effective Date, Vaxcyte GmbH paid Lonza a repurposing fee (the "Repurposing Fee") of CHF 27,000,000 that will be credited back to Vaxcyte GmbH over a 10-year period starting upon commencement of commercial production. In the event of a termination under certain circumstances, Lonza shall be obligated to provide certain wind-down and transition services to Vaxcyte GmbH for up to 12 and 24 months, respectively.

For additional details regarding our relationship with Lonza, see Note 7, "Commitments and Contingencies," and Note 4, "Commercial Manufacturing and Supply Agreement" to our consolidated financial statements included in Part II, Item 8 of this Annual Report on Form 10-K.

Sutro Biopharma

Sutro Biopharma is a clinical stage, publicly traded drug discovery, development and manufacturing company using precise protein engineering and rational design (enabled by Sutro Biopharma's proprietary XpressCF platform technology) to advance next-generation oncology therapeutics. Following our corporate formation, we acquired an exclusive license to Sutro Biopharma's proprietary cell-free protein synthesis platform, XpressCF, for the discovery, development and sale of vaccines for the treatment or prevention of infectious diseases, excluding cancer vaccines. Under a related supply agreement with Sutro Biopharma, we have an exclusive relationship in our field to buy extract and certain custom reagents for use in manufacturing the vaccine compositions covered by the exclusive license, which we use to produce our protein carriers and certain of our antigens. Under a separate agreement with Sutro Biopharma, we enhanced our rights with respect to access to a second supplier of extract and acquired an option to access expanded rights to develop and manufacture extract, among other rights. In November 2023, we exercised this option and entered in a manufacturing rights agreement to obtain control over manufacturing and development of cell-free extract for our vaccine candidates.

Amended and Restated License Agreement with Sutro Biopharma

We are party to an amended and restated license agreement with Sutro Biopharma, dated October 12, 2015, which was subsequently amended on May 9, 2018, May 29, 2018, September 28, 2023 and November 21, 2023 (as amended, the "Sutro Biopharma License Agreement"). Under the Sutro Biopharma License Agreement, we received an exclusive, worldwide, royalty-bearing, sublicensable license under Sutro Biopharma's patents and know-how relating to cell-free expression of proteins to (i) research, develop, use, sell, offer for sale, export, import

and otherwise exploit specified vaccine compositions, such rights being sublicensable, for the treatment or prophylaxis of infectious diseases, excluding cancer vaccines, and (ii) manufacture, or have manufactured by an approved contract manufacturing organization, such vaccine compositions from extracts supplied by Sutro Biopharma pursuant to the Sutro Biopharma Supply Agreement (as described below). We are obligated to use commercially reasonable efforts to develop, obtain regulatory approval for and commercialize the vaccine compositions. In consideration of the rights granted under the Sutro Biopharma License Agreement, we are obligated to pay Sutro Biopharma a 4% royalty on worldwide aggregate annual net sales of our vaccine products for human health and a 2% royalty on such net sales of vaccine products for animal health. Such royalty rates are subject to specified reductions, including standard reductions for third-party payments and for expiration of relevant patent claims. We are also obligated to pay Sutro Biopharma any royalties due to Stanford University (the upstream licensor of Sutro Biopharma), to the extent the royalties payable by Sutro Biopharma to Stanford University are greater than the royalties payable by us to Sutro Biopharma. Royalties are payable on a vaccine composition-by-vaccine composition and country-by-country basis until the later of expiration of the last valid claim in the licensed patents covering such vaccine composition in such country and ten years after the first commercial sale of such vaccine composition. The latest expiration date of a licensed Sutro Biopharma patent application, if issued, would be 2036, subject to any adjustment or extension of patent term that may be available in a particular country. In addition, we are obligated to pay Sutro Biopharma a percentage of net sublicensing revenue received in the low teen percentages. In addition, in the event we sublicense our non-manufacturing rights under the Sutro Biopharma License Agreement before a specified date, we are obligated to pay Sutro Biopharma a percentage, in the low double-digits, of the sublicensing revenue we receive under such agreement.

On September 28, 2023, we and Sutro Biopharma amended certain terms of the Sutro Biopharma License Agreement, including with respect to (i) royalty reduction provisions applicable in the event of expiration of relevant patent claims, which would result in lower royalties payable by us to Sutro Biopharma under certain circumstances, (ii) the ownership, prosecution, maintenance and enforcement of certain intellectual property rights licensed or arising under the Sutro Biopharma License Agreement (including as agreed to be amended in the Option Agreement (as defined below), and (iii) the timing and form for financial reporting of royalty payment calculations.

The Sutro Biopharma License Agreement will remain in effect until terminated. The agreement may be terminated by either party for the other party's material breach uncured within 60 days' notice, by us at will with 60 days' notice, or by Sutro Biopharma if we challenge Sutro Biopharma's patents or if we undergo a change of control with a specified competitor of Sutro Biopharma.

Supply Agreement with Sutro Biopharma

In May 2018, we entered into a supply agreement with Sutro Biopharma, which was subsequently amended on February 22, 2021 and November 21, 2023 (as amended, the "Sutro Biopharma Supply Agreement") pursuant to which we purchase from Sutro Biopharma extract and custom reagents for use in manufacturing non-clinical and certain clinical supply of vaccine compositions utilizing the technology licensed under the Sutro Biopharma License at prices not to exceed a specified percentage above Sutro Biopharma's fully burdened manufacturing cost. If any extracts or custom reagents do not meet the specifications and warranties provided, then we will not have an obligation to pay for the non-conforming product, and Sutro Biopharma will be obligated to replace the non-conforming product within the shortest possible time with conforming product at our cost. The term of the Sutro Biopharma Supply Agreement is from execution until the later of (i) July 31, 2022, or (ii) or the date that we and Sutro Biopharma enter into the Phase 3/Commercial Supply Agreement and Sutro is supplying to us each Product under the Phase 3/Commercial Supply Agreement (each term as defined in the Sutro Biopharma Supply Agreement). The Sutro Biopharma Supply Agreement may be terminated by either party for the other party's material breach uncured within 60 days' notice, by us at will with 60 days' notice, or by mutual agreement of the parties. In December 2019, we exercised our right to require Sutro Biopharma to establish a second supplier for extract and custom reagents to support our anticipated clinical and commercial needs.

Option Agreement with Sutro Biopharma

In December 2022, we entered into an option grant agreement with Sutro Biopharma (the "Option Agreement"). Pursuant to the Option Agreement, we acquired from Sutro Biopharma (i) authorization to enter into an agreement with an independent alternate contract manufacturing organization ("CMO") to directly source Sutro

Biopharma's cell-free extract, allowing us to have direct oversight over financial and operational aspects of the relationship with the CMO; and (ii) a right, but not an obligation, to obtain certain exclusive rights to internally manufacture and/or source extract from certain CMOs and the right to independently develop and make improvements to extract (including the right to make improvements to the extract manufacturing process as well as cell lines) for use in connection with the exploitation of certain vaccine compositions (the "Option"). We and Sutro Biopharma agreed to negotiate the terms and conditions of a form definitive agreement to be entered into in the event we exercise the Option, which would include the terms and conditions set forth in an executed term sheet between us (the "Term Sheet") and such terms that were necessary to give effect to each of the terms and conditions set forth in the Term Sheet (the "Form Definitive Agreement"). The Option period was five years from the date of the Option Agreement, subject to potential acceleration in the event we undergo a change of control.

As consideration for the Option and other rights and authorizations granted to us under the Option Agreement, we paid Sutro Biopharma upfront consideration of $22.5 million, consisting of (i) $10.0 million in cash and $7.5 million worth of shares of our common stock (the number of shares to be calculated based on the arithmetic average of the daily volume weighted average price of our common stock as traded on Nasdaq in the three consecutive trading days immediately prior to the issuance thereof), and (ii) $5.0 million payable within five business days after we and Sutro Biopharma mutually agree in writing upon the Form Definitive Agreement. The 167,780 shares of common stock issued was recorded at fair value of $8.0 million on the date of settlement, December 22, 2022. In the event that we elected to exercise the Option, we agreed to pay Sutro Biopharma an aggregate Option exercise price of $75.0 million in cash in two installments and, upon the occurrence of certain regulatory milestones, certain additional milestone payments totaling up to $60.0 million in cash.

On September 28, 2023, we and Sutro Biopharma mutually agreed in writing upon the Form Definitive Agreement to become effective in the event that we exercise the Option, and on October 2, 2023, we paid the $5.0 million accrued commitment.

On November 21, 2023 (the "Option Exercise Date"), we exercised the Option by submitting written notice thereof to Sutro Biopharma and concurrently paid Sutro Biopharma $50.0 million in cash as the first of two installment payments for the Option exercise price. Under the Option Agreement, we are obligated to pay Sutro an additional $25.0 million in cash within six months of the Option Exercise Date as the second of two installment payments for the Option exercise. Upon the occurrence of certain regulatory milestones, we would be obligated to pay Sutro Biopharma certain additional milestone payments totaling up to $60.0 million in cash. In the event that we undergo a change of control, certain rights and payments may be accelerated.

Manufacturing Rights Agreement with Sutro Biopharma

Concurrent with the payment of the first installment of the Option exercise price pursuant to the Option Agreement, on November 21, 2023, the manufacturing rights agreement (in the form of the Form Definitive Agreement) between us and Sutro Biopharma (the "Manufacturing Rights Agreement") became effective. Under the Manufacturing Rights Agreement, we received an exclusive (except as to Sutro Biopharma), perpetual (subject to termination), worldwide license, for no additional royalty (i.e., royalty-free, other than any royalties due under the Sutro Biopharma License Agreement), under Sutro Biopharma's relevant patents and know-how, to manufacture or have manufactured extract and improvements to extract (in any form) solely for use in the research, development, use, production, sale, offering for sale, export, import, commercialization or other exploitation of Vaccine Compositions (as defined in the Sutro Biopharma License Agreement) (as well as certain rights with respect to certain regulatory matters related to extract and its use in connection with such Vaccine Compositions). We have the right to extend our rights and obligations under the Manufacturing Rights Agreement to our affiliates and to sublicense our rights to manufacture extract and improvements to extract to certain third-party CMOs and other contractors (for our benefit and not for such third party's independent commercial use). For clarity, we are not permitted to manufacture extract for sale to third parties for the independent use of such third parties. Under the Manufacturing Rights Agreement, we have the obligation to protect the confidentiality of the extract manufacturing technology, and Sutro Biopharma has certain audit rights in connection therewith.

Under the Manufacturing Rights Agreement, upon our request and at our cost, Sutro Biopharma will support up to two technology transfers to us (or to an affiliate of ours or certain third-party CMOs designated by us) of certain Sutro Biopharma know-how, materials and information to enable us to manufacture or have manufactured

extract. Under certain circumstances, Sutro Biopharma may source extract from us or certain third-party CMOs, subject to reimbursement for technology transfer costs.

The Manufacturing Rights Agreements contains certain terms with respect to the ownership, prosecution, maintenance and enforcement of certain intellectual property rights licensed or arising under the Manufacturing Rights Agreement, which are generally consistent with the Sutro Biopharma License Agreement.

Unless earlier terminated, the Manufacturing Rights Agreement will remain in effect in perpetuity. Sutro Biopharma may only terminate the Manufacturing Rights Agreement in the event of our (i) uncured, intentional, material breach of certain confidentiality provisions resulting in actual, material harm to Sutro Biopharma's business, (ii) uncured, intentional material breach of certain provisions relating to the use of certain of Sutro Biopharma's know-how outside of the Vaccine Field, (iii) unintentional, material breach of certain provisions relating to the use of certain of Sutro Biopharma's know-how outside of the Vaccine Field that we do not use reasonable best efforts to cease and (to the extent reasonably curable) cure in a timely fashion, or (iv) uncured failure to pay the Option exercise price or any undisputed milestone payment under the Option Agreement when due. We may terminate the Manufacturing Rights Agreement at our discretion upon 60 days' written notice, and both parties may terminate the Manufacturing Rights Agreement upon mutual written consent.

For additional details regarding our relationship with Sutro Biopharma, see Note 7, "Commitments and Contingencies," and Note 15, "Related Party Transactions," to our consolidated financial statements included in Part II, Item 8 of this Annual Report on Form 10-K.

Impact of Certain Trends

The recent trends towards rising inflation may materially adversely affect our business and corresponding financial position and cash flows. Inflationary factors, such as increases in the cost of our clinical trial materials and supplies, interest rates and overhead costs may adversely affect our operating results. Rising interest and inflation rates also present a recent challenge impacting the U.S. economy and could make it more difficult for us to obtain traditional financing on acceptable terms, if at all, in the future.

We may experience increases in our operating costs in the near future including our labor costs and research and development costs, due to rising inflation, supply chain constraints, and civil and political unrest in certain countries and regions.

Components of Results of Operations

Operating Expenses

Research and Development

Research and development expenses represent costs incurred in performing research, development and manufacturing activities in support of our own product development efforts and include personnel-related costs (including salaries, employee benefits and stock-based compensation) for our personnel in research and development functions; costs related to acquiring, developing and manufacturing supplies for preclinical studies, clinical trials and other studies, including fees paid to CMOs; costs and expenses related to agreements with contract research organizations ("CROs"), investigative sites and consultants to conduct non-clinical and preclinical studies and clinical trials; professional and consulting services costs; research and development consumables costs; laboratory supplies and equipment costs; and facility and other allocated costs.

Research and development expenses are expensed as incurred. Non-refundable advance payments for services that will be used or rendered for future research and development activities are recorded as prepaid expenses and recognized as expenses as the related services are performed. We do not allocate all of our costs by vaccine candidates, as our research and development expenses include internal costs, such as payroll and other personnel expenses, which are not tracked by vaccine candidate. In particular, with respect to internal costs, several of our departments support multiple vaccine candidate research and development programs.

We expect our research and development expenses to increase substantially in absolute dollars for the foreseeable future as we advance our vaccine candidates into and through preclinical studies and clinical trials, manufacture drug product for our clinical trials, scale up our manufacturing activities, establish additional manufacturing capacity to meet potential incremental supply requirements following the potential initial commercial launch of VAX-24 or VAX-31 for adults, pursue regulatory approval of our vaccine candidates and expand our pipeline of vaccine candidates. The process of conducting the necessary preclinical and clinical research and completing the manufacturing requirements to obtain regulatory approval is costly and time-consuming. The actual probability of success for our vaccine candidates may be affected by a variety of factors, including the safety and efficacy or immunogenicity of our vaccine candidates, clinical data, investment in our clinical programs, competition, manufacturing capabilities and commercial viability. We may never succeed in achieving regulatory approval for any of our vaccine candidates. As a result of the uncertainties discussed above, we are unable to determine the duration and completion costs of our research and development projects or if, when and to what extent we will generate revenue from the commercialization and sale of our vaccine candidates.

We accrue for costs related to research and development activities based on our estimates of the services received and efforts expended pursuant to quotes and contracts with vendors, including CMOs and CROs, that conduct research, development and manufacturing activities on our behalf. The financial terms of these agreements are subject to negotiation, vary from contract to contract and may result in uneven payment flows. There may be instances in which payments made to our vendors exceed the level of services provided and result in a prepayment of the research and development expense. Advance payments for goods and services to be used in future research and development activities are expensed when the activity has been performed or when the goods have been received. We make significant judgments and estimates in determining accrued research and development liabilities as of each reporting period based on the estimated time period over which services will be performed and the level of effort to be expended. If the actual timing of the performance of services or the level of effort varies from our estimate, we adjust the accrual or prepaid expense accordingly.

Although we do not expect our estimates to be materially different from amounts actually incurred, if our estimates of the status and timing of services performed differ from the actual status and timing of services performed, it could result in us reporting amounts that are too high or too low in any particular period.

Our research and development costs may vary significantly based on factors such as:

- the costs and timing of our CMC activities, including fulfilling good manufacturing practice (“GMP”) related standards and compliance, and identifying and qualifying second suppliers;
- the costs related to raw materials we purchase directly or through third-party manufacturing and supply partners;
- the cost of clinical trials of our vaccine candidates;
- changes in the standard-of-care on which a clinical development plan was based, which may require new or additional trials;
- the number of sites included in the trials;
- the countries in which the trials are conducted;
- delays in adding a sufficient number of trial sites and recruiting suitable volunteers to participate in our clinical trials;
- the number of subjects that participate in the trials;
- the number of doses that subjects receive;
- subjects dropping out of a study or lost in follow-up;

- potential additional safety monitoring requested by regulatory agencies;
- the duration of subject participation in the trials and follow-up;
- the cost and timing of manufacturing our vaccine candidates;
- the phase of development of our vaccine candidates;
- the costs of establishing additional manufacturing capacity to meet potential incremental supply requirements following the potential initial commercial launch of VAX-24 or VAX-31 for adults;
- the costs that may be required for secondary supply sources; and
- the immunogenicity or efficacy and safety and tolerability profile of our vaccine candidates.

General and Administrative

General and administrative expenses consist primarily of costs and expenses related to personnel (including salaries, employee benefits and stock-based compensation) in our executive, legal, finance and accounting, human resources and other administrative functions; legal services relating to intellectual property and corporate matters; accounting, auditing, consulting and tax services; insurance; and facility and other allocated costs not otherwise included in research and development expenses. We expect our general and administrative expenses to continue to increase in absolute dollars for the foreseeable future as we increase our headcount and expand our services to support our continued research and development activities and grow our business. We expect continued increases in general and administrative expenses related to human resources, finance and accounting, legal, insurance expenses, investor relations and corporate communications activities and other administrative and professional services.

Other Income (Expense), Net

Other income (expense), net includes interest income earned from our cash and cash equivalents and investments, grant income, foreign currency transaction gains (losses) related to our Swiss Franc and Euro cash and liability balances, loss on disposals of fixed assets and interest expense.

Interest Income

Interest income is earned from our cash and cash equivalent balances and short- and long-term investments. The cost of investment securities is adjusted for amortization of premiums and accretion of discounts to maturity. Such amortization and accretion are included in other income (expense), net. Realized gains and losses are also included in other income (expense), net. When the fair value of a debt security declines below its amortized cost basis, any portion of that decline attributable to credit losses, to the extent expected to be nonrecoverable before the sale of the security, is recognized in our consolidated statements of operations. When the fair value of a debt security declines below its amortized cost basis due to changes in interest rates, such amounts are recorded in other comprehensive loss, and are recognized in our consolidated statements of operations only if we sell or intend to sell the security before recovery of its cost basis.

Grant Income

Our VAX-A1 vaccine development program currently is funded in part by a grant obtained from Combating Antibiotic Resistant Bacteria Biopharmaceutical Accelerator (“CARB-X”), a global non-profit partnership dedicated to accelerating antibacterial innovation to tackle the rising global threat of drug-resistant bacteria. The CARB-X grant provides for total potential funding of up to $14.6 million (including $11.7 million awarded to date since the grant’s inception in 2019) upon the achievement of VAX-A1 development milestones through June 2024.

Our VAX-GI vaccine development program is currently funded in part by two grants obtained from the National Institutes of Health ("NIH"), administered by the University of Maryland, Baltimore. Our first grant from the NIH was awarded in April 2021 and provides for potential funding up to five years totaling approximately $0.5 million. In June 2023, we received another grant from the NIH that provides for potential funding up to five years totaling approximately $4.6 million.

We recognized $4.8 million, $1.9 million and $1.6 million in grant income for funding research and development under these awards during the years ended December 31, 2023, 2022 and 2021, respectively. Grant income is included as a component of Other income (expense), net in the consolidated statements of operations.

Results of Operations

Comparison of the Years Ended December 31, 2023 and 2022

The following table summarizes our results of operations for the periods presented:

	Year Ended December 31,		Change	
	2023	2022	$	%
	(in thousands)			
Operating expenses:				
Research and development	$ 332,341	$ 169,451	$ 162,890	96.1 %
Acquired manufacturing rights	75,000	$ 22,995	52,005	226.2 %
General and administrative	60,700	39,810	20,890	52.5 %
Total operating expenses	468,041	232,256	235,785	101.5 %
Loss from operations	(468,041)	(232,256)	(235,785)	101.5 %
Other income (expense), net:				
Interest expense	—	(2)	2	(100.0)%
Interest income	62,907	8,356	54,551	*
Grant income	4,765	1,931	2,834	146.8 %
Loss on disposal of fixed assets	—	(44)	44	(100.0)%
Foreign currency transaction gain (loss)	(1,897)	(1,470)	(427)	29.0 %
Total other income (expense), net	65,775	8,771	57,004	649.9 %
Net loss	$ (402,266)	$ (223,485)	$ (178,781)	80.0 %

* *not meaningful*

Operating Expenses

Research and Development Expenses

The following table summarizes our research and development expenses for the periods presented:

	Year Ended December 31,		Change	
	2023	2022	$	%
	(in thousands)			
Product and clinical development [1]	$ 204,643	$ 80,869	$ 123,774	153.1 %
Personnel-related	64,269	33,776	30,493	90.3 %
Professional and consulting services	7,530	5,811	1,719	29.6 %
Research and development consumables	17,786	23,533	(5,747)	(24.4)%
Facility related and other allocated	22,253	17,243	5,010	29.1 %
Laboratory supplies and equipment	12,721	5,498	7,223	131.4 %
Other [2]	3,139	2,721	418	15.4 %
Total research and development expenses	$ 332,341	$ 169,451	$ 162,890	96.1 %

(1) Includes expenses for third-party manufacturing and outsourced contract services, including preclinical studies, clinical trials and outsourced assays.
(2) Includes travel-related expenses and other miscellaneous office expenses.

Research and development expenses increased by $162.9 million, or 96.1%, in 2023 compared to 2022. The increases of $123.8 million in product and clinical development expenses, $7.2 million in laboratory supplies and equipment and $5.0 million in facility and other allocated expenses were primarily due to (i) Phase 3 readiness activities for our adult PCV program, primarily related to manufacturing, and, to a lesser degree, (ii) VAX-A1 research and development costs, (iii) VAX-24 Phase 2 infant clinical study costs, (iv) manufacturing readiness activities in connection with the potential future commercial launches of our PCV programs, and (v) the initiation of the clinical proof-of-concept VAX-31 Phase 1/2 study in adults, partially offset by lower costs related to the VAX-24 adult Phase 2 program which concluded in 2023. The decrease of $5.7 million in research and development consumables was primarily related to higher costs incurred in 2022 for extract and reagents for Phase 3 readiness and commercial preparation activities for our PCV programs. The increase of $30.5 million in personnel-related expenses was primarily due to growth in the number of employees in our research and development functions and higher compensation costs, including salaries, benefits and stock-based compensation expense.

Acquired Manufacturing Rights

In December 2022, we entered into the Option Agreement with Sutro Biopharma, pursuant to which we acquired the Option. As consideration for the Option and other rights and authorizations granted to us under the Option Agreement, we paid Sutro Biopharma upfront consideration of $22.5 million, consisting of (i) $10.0 million in cash and $7.5 million worth of shares of our common stock (the number of shares to be calculated based on the arithmetic average of the daily volume weighted average price of our common stock as traded on Nasdaq in the three consecutive trading days immediately prior to the issuance thereof) and (ii) $5.0 million payable within five business days after we and Sutro Biopharma mutually agree in writing upon the Form Definitive Agreement. The 167,780 shares of common stock issued was recorded at fair value of $8.0 million on the date of settlement, December 22, 2022. In the event that we elected to exercise the Option, we agreed to pay Sutro Biopharma an aggregate Option exercise price of $75.0 million in cash in two installments and, upon the occurrence of certain regulatory milestones, certain additional milestone payments totaling up to $60.0 million in cash.

In September 2023, we and Sutro Biopharma mutually agreed in writing to the Form Definitive Agreement to become effective in the event that we exercise the Option, and in October 2023, we paid Sutro Biopharma the $5.0 million that was previously accrued.

In November 2023, we exercised the Option by submitting written notice thereof to Sutro Biopharma and concurrently paid Sutro Biopharma $50.0 million in cash as the first of two installment payments for the Option exercise price. Under the Option Agreement, we are obligated to pay Sutro an additional $25.0 million in cash within six months of the Option Exercise Date as the second of two installment payments for the Option exercise. This has been accrued on our consolidated balance sheets as of December 31, 2023. Upon the occurrence of certain regulatory milestones, we would be obligated to pay Sutro Biopharma certain additional milestone payments totaling up to $60.0 million in cash. In the event that we undergo a change of control, certain rights and payments may be accelerated.

As of December 31, 2023 and 2022, we have determined there is no current alternative future use of the acquired manufacturing rights paid and expensed the Option as of December 31, 2023 and 2022. We have classified the costs incurred related to the execution of the Option Agreement, the mutual agreement of the Form Definitive Agreement and the Option exercise, as Acquired Manufacturing Rights in the accompanying consolidated statement of operations for the years ended December 31, 2023 and 2022.

General and Administrative Expenses

General and administrative expenses increased by $20.9 million, or 52.5%, in 2023 compared to 2022. The increase was mainly due to increases of (i) $17.7 million in personnel-related costs related to growth in the

number of employees in our general and administrative functions and higher compensation costs, including salaries, benefits and stock-based compensation expense, and (ii) $3.7 million in professional and consulting services.

Other Income (Expense), Net

Other income (expense), net increased by $57.0 million, or 649.9%, in 2023 compared to 2022. The increase was mainly due to increases of (i) $54.6 million in interest income resulting from higher cash balances generated from our follow-on financings and our ATM program (as described below) during the year and higher interest rates and, to a lesser extent, (ii) $2.8 million in grant income.

Comparison of the Years Ended December 31, 2022 and 2021

The following table summarizes our results of operations for the periods presented:

	Year Ended December 31,		Change	
	2022	2021	$	%
	(in thousands)			
Operating expenses:				
Research and development	$ 169,451	$ 78,411	$ 91,040	116.1 %
Acquired manufacturing rights	22,995	—	22,995	100.0 %
General and administrative	39,810	25,259	14,551	57.6 %
Total operating expenses	232,256	103,670	128,586	124.0 %
Loss from operations	(232,256)	(103,670)	(128,586)	124.0 %
Other income (expense), net:				
Interest expense	(2)	(7)	5	(71.4)%
Interest income	8,356	344	8,012	*
Grant income	1,931	1,585	346	21.8 %
Realized gain on marketable securities	—	2	(2)	(100.0)%
Loss on disposal of fixed assets	(44)	—	(44)	100.0 %
Foreign currency transaction gain (loss)	(1,470)	1,669	(3,139)	*
Total other income (expense), net	8,771	3,593	5,178	144.1 %
Net loss	$ (223,485)	$ (100,077)	$ (123,408)	123.3 %

** not meaningful*

Research and Development Expenses

The following table summarizes our research and development expenses for the periods presented:

	Year Ended December 31,		Change	
	2022	2021	$	%
	(in thousands)			
Product and clinical development [1]	$ 80,869	$ 37,215	$ 43,654	117.3 %
Personnel-related	33,776	17,476	16,300	93.3 %
Professional and consulting services	5,811	4,351	1,460	33.6 %
Research and development consumables	23,533	6,848	16,685	243.6 %
Facility related and other allocated	17,243	8,098	9,145	112.9 %
Laboratory supplies and equipment	5,498	3,421	2,077	60.7 %
Other [2]	2,721	1,002	1,719	171.6 %
Total research and development expenses	$ 169,451	$ 78,411	$ 91,040	116.1 %

(1) Includes expenses for third-party manufacturing and outsourced contract services, including preclinical studies and outsourced assays.
(2) Includes travel-related expenses, other miscellaneous office expenses and warrant expense.

Research and development expenses increased by $91.0 million, or 116.1%, in 2022 compared to 2021. The increases of $43.7 million in product and clinical development expenses and $2.1 million in laboratory supplies and equipment were primarily due to increased VAX-31 IND readiness activities, increased VAX-24 Phase 3 readiness activities, the initiation of the VAX-24 Phase 1/2 clinical proof-of-concept study in adults 18-64 years of age and the initiation of the VAX-24 Phase 2 clinical study in adults 65 years and older, partially offset by a decrease in VAX-24 IND readiness activities as the IND application for our VAX-24 adult indication was submitted in late 2021. The increase of $16.7 million in research and development consumables was primarily related to costs incurred for extract and reagents for VAX-24 Phase 3 readiness and commercial preparation activities. The increase of $16.3 million in personnel-related expenses was primarily due to growth in the number of employees in our research and development functions and higher compensation costs, including salaries, benefits and stock-based compensation expense. The increase of $9.1 million in facility related and other allocated expenses was primarily due to an increase in lease expense related to our current corporate headquarters.

General and Administrative Expenses

General and administrative expenses increased by $14.6 million, or 57.6%, in 2022 compared to 2021. The increase was mainly due to increases of (i) $11.5 million in personnel-related costs related to growth in the number of employees in our general and administrative functions and higher compensation costs, including salaries, benefits and stock-based compensation expense, and (ii) $2.9 million in professional and consulting services.

Other Income (Expense), Net

Other income (expense), net increased by $5.2 million, or 144.1%, in 2022 compared to 2021. The increase was mainly due to an increase of $8.0 million in interest income resulting from higher cash balances generated from our follow-on financings in the first and fourth quarters of 2022 and our ATM program (as described below) during the year and higher interest rates. This was partially offset by an increase in foreign currency losses due to the appreciation of the U.S dollar against the Swiss Franc and Euro.

Liquidity and Capital Resources

From inception through December 31, 2023, we have incurred losses and negative cash flows from operations and have funded our operations primarily through the issuance of common stock, pre-funded warrants to purchase our common stock and, prior to our IPO, redeemable convertible preferred stock, totaling approximately $2.16 billion in aggregate gross proceeds and $2.05 billion net of underwriting discounts, commissions and offering expenses. As of December 31, 2023, we had $397.5 million of cash and cash equivalents, $845.5 million in investments and an accumulated deficit of $924.4 million.

On July 2, 2021, we filed a shelf registration statement on Form S-3ASR (the "Shelf Registration Statement") under which we may, from time to time, sell securities in one or more offerings of our common stock, preferred stock, debt securities or warrants. The Shelf Registration Statement became automatically effective upon the filing of the Form S-3ASR on July 2, 2021.

ATM Program

In July 2021, we entered into an Open Market Sales Agreement℠ (the "Original ATM Sales Agreement") with Jefferies LLC ("Jefferies") which provided that, upon the terms and subject to the conditions and limitations set forth in the Original ATM Sales Agreement, we may elect to issue and sell, from time to time, shares of our common stock having an aggregate offering price of up to $150.0 million through Jefferies acting as our sales agent or principal. As of February 27, 2023, we had sold 4,995,709 shares of our common stock under the Original ATM Sales Agreement at an average price of $27.57 per share for aggregate gross proceeds of $137.8 million. On February 27, 2023, we and Jefferies entered into an amendment to the Original ATM Sales Agreement (as amended, the "Amended ATM Sales Agreement") pursuant to which we may offer and sell shares of our common stock having an aggregate offering price of up to $400.0 million, which is in addition to the $150.0 million aggregate offering price under the Original ATM Sales Agreement. The material terms and conditions of the Original ATM Sales Agreement otherwise remain unchanged. We will pay Jefferies a commission of up to 3.0% of the gross sales

proceeds of any common stock sold through Jefferies under the Amended ATM Sales Agreement; however, we are not obligated to make any sales of common stock. As of December 31, 2023, we have sold 1,588,807 shares of our common stock under the Amended ATM Sales Agreement at an average price of $44.06 per share for aggregate gross proceeds of $70.0 million ($68.6 million net of commissions and offering expenses).

Underwritten Follow-on Public Offerings

In January 2022, we completed an underwritten public offering in which we issued 2,500,000 shares of common stock at a price of $20.00 per share and pre-funded warrants to purchase 2,500,000 shares of our common stock at a price of $19.999 per underlying share. In February 2022, the underwriters exercised their option to purchase an additional 750,000 shares of common stock. In aggregate, we received $107.6 million in net proceeds after deducting underwriting discounts and commissions and other offering expenses payable by us, and excluding the exercise of any pre-funded warrants.

In October 2022, we completed an underwritten public offering of 17,812,500 shares of our common stock, which included the full exercise of the underwriters' option to purchase an additional 2,812,500 shares, at a price of $32.00 per share and pre-funded warrants to purchase 3,750,000 shares of our common stock at a price of $31.999 per underlying share. In aggregate, we received $651.6 million in net proceeds after deducting underwriting discounts and commissions and other offering expenses payable by us, and excluding the exercise of any pre-funded warrants.

In April 2023, we completed an underwritten public offering of 13,030,000 shares of our common stock, which included the full exercise of the underwriters' option to purchase an additional 1,830,000 shares, at a price of $41.00 per share and pre-funded warrants to purchase 1,000,000 shares of our common stock at a price of $40.999 per underlying share. In aggregate, we received $545.3 million in net proceeds after deducting underwriting discounts and commissions and other estimated offering expenses payable by us, and excluding the exercise of any pre-funded warrants.

In February 2024, we completed an underwritten public offering of 12,695,312 shares of our common stock, which included the full exercise of the underwriters' option to purchase an additional 1,757,812 shares, at a price of $64.00 per share and pre-funded warrants to purchase 781,250 shares of our common stock at a price of $63.999 per underlying share. In aggregate, we received approximately $816.5 million in net proceeds after deducting underwriting discounts and commissions and other estimated offering expenses payable by us, and excluding the exercise of any pre-funded warrants.

Future Funding Requirements

Our primary uses of cash are to fund our operations, which consist primarily of research and development expenditures related to our programs and, to a lesser extent, capital expenditures for our commercial manufacturing facility build-out and general and administrative expenditures. We anticipate that we will continue to incur significant expenses and capital expenditures for the foreseeable future as we continue to advance our vaccine candidates, expand our corporate infrastructure, further our research and development initiatives for our vaccine candidates, build out and operate our commercial manufacturing facilities, and scale our laboratory and manufacturing operations. We are subject to all of the risks typically related to the development of new drug candidates, and we may encounter unforeseen expenses, difficulties, complications, delays and other unknown factors that may adversely affect our business. We anticipate that we will need substantial additional funding in connection with our continuing operations.

We believe that our existing cash, cash equivalents and investments as of the date of this Annual Report on Form 10-K will be sufficient to fund our operating expenses and capital expenditure requirements through at least 12 months from the filing date of this Annual Report on Form 10-K. We have raised substantial capital; however, we will need to raise substantial additional capital to complete development, manufacturing and commercialization of our drug candidates. Until we can generate sufficient revenue from the commercialization of our vaccine candidates or from collaboration agreements with third parties, if ever, we expect to finance our future cash needs through public or private equity or debt financings, third-party (including government) funding and marketing and

distribution arrangements, as well as other collaborations, strategic alliances and licensing arrangements, or any combination of these approaches. The sale of equity, pre-funded warrants or convertible debt securities may result in dilution to our stockholders and, in the case of preferred equity securities or convertible debt, those securities could provide for rights, preferences or privileges senior to those of our common stock. Debt financings may subject us to covenant limitations or restrictions on our ability to take specific actions, such as incurring additional debt, making capital expenditures or declaring dividends. Our ability to raise additional funds may be adversely impacted by deteriorating global economic conditions, including higher inflation rates and changes in interest rates, and the recent disruptions to and volatility in the credit and financial markets in the United States and worldwide. There can be no assurance that we will be successful in acquiring additional funding at levels sufficient to fund our operations or on terms favorable or acceptable to us. If we are unable to obtain adequate financing when needed or on terms favorable or acceptable to us, we may be forced to delay, reduce the scope of or eliminate one or more of our research and development programs.

Our future capital requirements will depend on many factors, including:

- the timing, scope, progress, results and costs of research and development, testing, screening, manufacturing, preclinical development and clinical trials;
- the costs of establishing additional manufacturing capacity to meet potential incremental supply requirements following the potential initial commercial launch of VAX-24 or VAX-31 for adults;
- the outcome, timing and cost of seeking and obtaining regulatory approvals from the FDA and comparable foreign regulatory authorities, including the potential for such authorities to require that we perform field efficacy studies for our PCV candidates, require more studies than those that we currently expect or change their requirements regarding the data required to support a marketing application;
- the cost of building a sales force in anticipation of any product commercialization;
- the costs of future commercialization activities, including product manufacturing, marketing, sales, royalties and distribution, for any of our vaccine candidates for which we receive marketing approval;
- our ability to maintain existing, and establish new, strategic collaborations, licensing or other arrangements and the financial terms of any such agreements, including the timing and amount of any future milestone, royalty or other payments due under any such agreement;
- exchange rate fluctuations due to exposure of foreign operations and foreign currency fluctuations and translations;
- any product liability or other lawsuits related to our products;
- the revenue, if any, received from commercial sales, or sales to foreign governments, of our vaccine candidates for which we may receive marketing approval;
- the costs to establish, maintain, expand, enforce and defend the scope of our intellectual property portfolio, including the amount and timing of any payments we may be required to make, or that we

may receive, in connection with licensing, preparing, filing, prosecuting, defending and enforcing our patents or other intellectual property rights;

- expenses needed to attract, hire and retain skilled personnel; and
- the impact of macroeconomic factors, including rising inflation which may impact labor costs, research and development costs and supply chain constraints, as well as civil and political unrest in certain countries and regions, which may exacerbate the magnitude of the factors discussed above.

A change in the outcome of any of these or other variables could significantly change the costs and timing associated with the development of our vaccine candidates. Furthermore, our operating plans may change in the future, and we may need additional funds to meet operational needs and capital requirements associated with such change.

Cash Flows

The following table summarizes our cash flows for the periods indicated:

	Year Ended December 31,		
	2023	2022	2021
	(in thousands)		
Net cash used in operating activities	$ (296,790)	$ (170,597)	$ (121,393)
Net cash (used in) provided by investing activities	(773,311)	74,585	(212,308)
Net cash provided by financing activities	639,813	861,547	17,796
Effect of exchange rate changes on cash and cash equivalents	(6,686)	137	(439)
Net increase (decrease) in cash and cash equivalents	$ (436,974)	$ 765,672	$ (316,344)

Cash Flows from Operating Activities

Net cash used in operating activities for the year ended December 31, 2023 was $296.8 million, which primarily resulted from a net loss of $402.3 million, partially offset by net non-cash charges of $24.2 million and a net change in operating assets and liabilities of $81.3 million. Non-cash charges primarily consisted of $48.8 million in stock-based compensation, $7.0 million in amortization of right-of-use ("ROU") assets and $3.2 million in depreciation and amortization, partially offset by a net accretion of discounts on investments of $34.8 million. The net change in operating assets and liabilities of $81.3 million was primarily due to increases in cash flows from (i) accrued manufacturing expenses of $44.5 million, (ii) accrued expenses of $36.3 million, mainly attributable to the $25.0 million accrued payable in connection to the Sutro Option exercise, (iii) prepaid and other assets of $17.9 million, mainly attributable to an increase in accretion income from capital deployed into our investments, (iv) amortization of existing operating lease ROU assets of $11.3 million, (v) accounts payable of $11.2 million, and (vi) accrued compensation of $9.9 million, partially offset by decreases in other assets of $33.0 million, mainly attributable to the manufacturing facility buildout, and operating lease ROU asset of $16.7 million due to new lease entered during the year.

Net cash used in operating activities for the year ended December 31, 2022 was $170.6 million, which primarily resulted from a net loss of $223.5 million, partially offset by non-cash charges of $40.2 million and a net change in operating assets and liabilities of $12.7 million. Non-cash charges primarily consisted of $23.7 million in stock-based compensation, $8.0 million in non-cash payments for the acquired manufacturing rights, $6.6 million in amortization of ROU assets and $2.6 million in depreciation and amortization. The net change in operating assets and liabilities of $12.7 million was primarily due to increases in cash flows from accrued expenses of $7.2 million, accrued manufacturing expenses of $3.8 million and accounts payable of $2.9 million, partially offset by a decrease in cash flows from accrued compensation of $2.3 million.

Net cash used in operating activities for the year ended December 31, 2021 was $121.4 million, which primarily resulted from a net loss of $100.1 million and a net change in operating assets and liabilities of $37.0 million, partially offset by non-cash charges of $15.7 million. The net change in operating assets and liabilities of

$37.0 million was primarily due to decreases in cash flows due to (i) operating lease liabilities of $12.9 million resulting from leasehold improvements costs applied against such liabilities upon the commencement of our San Carlos office lease in December 2021, (ii) accounts payable of $12.5 million resulting primarily from the payment of deferred Lonza payables in December 2021, (iii) accrued manufacturing expenses of $8.6 million resulting from timing of payments, (iv) and prepaid and other current assets of $7.4 million related to a receivable for reimbursement of tenant improvement allowance and prepayments on various contracts, including repairs and maintenance, production of critical raw materials, research and clinical trial preparation. These changes were partially offset by increases in cash flows due to accrued expenses of $4.6 million primarily related to costs associated with the manufacture of extract in connection with our relationship with Sutro Biopharma. Non-cash charges consisted of $10.7 million in stock-based compensation expense, $1.8 million in depreciation and amortization, $1.7 million in amortization of operating lease ROU assets and $1.4 million in net amortization of premiums on investments.

Cash Flows from Investing Activities

Cash used in investing activities for the year ended December 31, 2023 was $773.3 million, which related primarily to $1,329.9 million in purchases of investments, $51.8 million in payments related to manufacturing facility and equipment construction-in-progress and $16.1 million in purchases of property and equipment, partially offset by $611.9 million in maturities of investments and $12.6 million in sales of investments.

Cash provided by investing activities for the year ended December 31, 2022 was $74.6 million, which related primarily to $168.7 million in maturities of investments and $14.5 million in sales of investments, partially offset by $102.7 million in purchases of investments and $5.8 million in purchases of lab equipment and furniture and fixtures.

Cash used in investing activities for the year ended December 31, 2021 was $212.3 million which related primarily to $336.3 million in purchases of investments and $6.6 million in purchases of lab equipment and furniture and fixtures, partially offset by $100.5 million in maturities of investments and $30.1 million in sales of investments.

Cash Flows from Financing Activities

Cash provided by financing activities for the year ended December 31, 2023 was $639.8 million, which primarily consisted of net proceeds from the follow-on offering in the second quarter of 2023 of $545.3 million, net proceeds from shares issued under our Amended ATM Sales Agreement of $90.7 million and proceeds from exercises of common stock options of $5.6 million.

Cash provided by financing activities for the year ended December 31, 2022 was $861.5 million, which primarily consisted of net proceeds from the follow-on offerings in the first and fourth quarters of 2022 of $759.2 million in aggregate, net proceeds from shares issued under our Amended ATM Sales Agreement of $97.3 million and proceeds from exercises of common stock options of $4.9 million.

Cash provided by financing activities for the year ended December 31, 2021 was $17.8 million, which primarily consisted of net proceeds from shares issued under our Amended ATM Sales Agreement of $13.9 million and proceeds from exercises of common stock options of $3.0 million.

Contractual Obligations and Commitments

Our material cash requirements include the following contractual and other obligations.

Leases

We have operating lease agreements for our office spaces. As of December 31, 2023, we had lease payment obligations totaling $37.1 million, of which $8.8 million is payable within one year.

Option Agreement

In November 2023 (the "Option Exercise Date"), we exercised the Option pursuant to the Option Agreement by submitting written notice thereof to Sutro Biopharma and concurrently paid Sutro Biopharma $50.0 million in cash as the first of two installment payments for the Option exercise price. Under the Option Agreement, we are obligated to pay Sutro an additional $25.0 million in cash within six months of the Option Exercise Date as the second of two installment payments for the Option exercise. Upon the occurrence of certain regulatory milestones, we would be obligated to pay Sutro Biopharma certain additional milestone payments totaling up to $60.0 million in cash. In the event that we undergo a change of control, certain rights and payments may be accelerated.

Purchase Obligations

We have certain payment obligations under various license agreements. Under these agreements, we are required to make milestone payments upon successful completion and achievement of certain intellectual property, clinical, regulatory and sales milestones. The payment obligations under the license agreements are contingent upon future events such as our achievement of specified development, clinical, regulatory and commercial milestones, and we will be required to make development milestone payments and royalty payments in connection with the sale of products developed under these agreements. As the achievement and timing of these future milestone payments are not probable or estimable, such amounts have not been included in our balance sheets as of December 31, 2023 or December 31, 2022.

We enter into agreements in the normal course of business with CMOs and other vendors for manufacturing services and raw materials purchases. We rely on several third-party manufacturers for our manufacturing requirements. As of December 31, 2023, we had the following amounts of non-cancelable purchase commitments related to manufacturing services and raw materials purchased due to our key manufacturing partners. These amounts represent our minimum contractual obligations, including termination fees. If we terminate certain firm orders with our key manufacturing partners, we will be required to pay for the manufacturing services scheduled or raw materials purchased under our arrangements. The actual amounts we pay in the future to the vendors under such agreements may differ from the purchase order amounts.

Years ending December 31,	**(in thousands)**
2024	$ 181,812
2025	41,840
2026	1,296
2027	414
Total non-cancelable purchase commitments due to key manufacturing partners	$ 225,362

Critical Accounting Policies and Significant Judgments and Estimates

Our management's discussion and analysis of our financial condition and results of operations are based on our consolidated financial statements, which have been prepared in accordance with accounting principles generally accepted in the United States of America. The preparation of these consolidated financial statements requires us to make estimates and judgments that affect the reported amounts of assets, liabilities and expenses and the disclosure of contingent assets and liabilities in our consolidated financial statements. On an ongoing basis, we evaluate our estimates and judgments, including those related to accrued research and development expenses, stock-based compensation and leases. We base our estimates on historical experience, known trends and events and various other factors that are believed to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions.

While our significant accounting policies are described in the notes to our consolidated financial statements included elsewhere in this Annual Report on Form 10-K, we believe that the following critical accounting policies are most important to understanding and evaluating our reported financial results:

Accrued Research and Development Expenses

We have entered into various agreements with CMOs and CROs. As part of the process of preparing our consolidated financial statements, we are required to estimate our accrued research and development expenses, including accrued manufacturing expenses, as of each balance sheet date. This process involves reviewing open contracts and purchase orders, communicating with our personnel and third parties to identify services that have been performed on our behalf and estimating the level of service performed and the associated cost incurred for the service when we have not yet been invoiced or otherwise notified of the actual cost. We make estimates of our accrued research and development expenses as of each balance sheet date based on facts and circumstances known to us at that time. We periodically confirm the accuracy of our estimates with the service providers and make adjustments, if necessary. The significant estimates in our accrued research and development expenses include the costs incurred for services performed by our vendors in connection with research and development activities for which we have not yet been invoiced.

We accrue for costs related to research and development activities based on our estimates of the services received and efforts expended pursuant to quotes and contracts with vendors, including CMOs and CROs, that conduct research, development and manufacturing on our behalf. The financial terms of these agreements are subject to negotiation, vary from contract to contract and may result in uneven payment flows. There may be instances in which payments made to our vendors will exceed the level of services provided and result in a prepayment of the research and development expense. Advance payments for goods and services that will be used in future research and development activities are expensed when the activity has been performed or when the goods have been received. We make significant judgments and estimates in determining accrued research and development liabilities as of each reporting period based on the estimated time period over which services will be performed and the level of effort to be expended. If the actual timing of the performance of services or the level of effort varies from our estimate, we adjust the accrual or prepaid expense accordingly.

Although we do not expect our estimates to be materially different from amounts actually incurred, if our estimates of the status and timing of services performed differ from the actual status and timing of services performed, it could result in us reporting amounts that are too high or too low in any particular period. To date, there have been no material differences between our estimates of such expenses and the amounts actually incurred.

Stock-Based Compensation Expense

Stock-based compensation expense related to awards to employees is measured at the grant date based on the fair value of the award. The fair value of the award that is ultimately expected to vest is recognized as expense on a straight-line basis over the requisite service period, which is generally the vesting period, net of the impact of actual forfeitures recorded in the period in which they occur.

Stock-based compensation expense related to awards to non-employees is recognized based on the then-current fair value at each measurement date over the associated service period of the award, which is generally the vesting term, using the straight-line method. The fair value of non-employee stock options is estimated using the Black-Scholes valuation model with assumptions generally consistent with those used for employee stock options, with the exception of the expected term, which is the remaining contractual life at each measurement date. Refer to Note 2, “Basis of Presentation and Summary of Significant Accounting Policies,” and Note 10, “Equity Incentive Plans,” to our consolidated financial statements for more information on assumptions used in estimating stock-based compensation expense.

The Black-Scholes option-pricing model requires the use of subjective assumptions, such as volatility, which determine the fair value of stock-based awards. The assumptions utilized in the Black-Scholes option-pricing model are as follows:

Expected Term

Expected term represents the period that our stock-based awards are expected to be outstanding. The expected term for employee equity instruments is calculated using the simplified method where there is insufficient historical data about exercise patterns and post-vesting employment termination behavior. The simplified method is based on the vesting period and the contractual term for each grant, or for each vesting-tranche for awards with graded vesting. The mid-point between the vesting date and the maximum contractual expiration date is used as the expected term under this method. For awards with multiple vesting-tranches, the time from grant until the mid-points for each of the tranches may be averaged to provide an overall expected term. The expected term for non-employee stock options is the remaining contractual term.

Expected Volatility

Expected volatility is estimated from the average historical volatilities of publicly traded companies within the life sciences industry that are considered to be comparable to our business over a period approximately equal to the expected term for employees' options and the remaining contractual life for non-employees' options. We will continue to apply this process until a sufficient amount of historical information regarding the volatility of our own stock price becomes available.

Expected Dividend

We have not paid and do not anticipate paying any dividends in the near future. Accordingly, we have estimated the dividend yield to be zero.

Risk-Free Interest Rate

The risk-free interest rate is based on the U.S. Treasury yield in effect at the time of grant for zero-coupon notes with remaining terms corresponding with the expected term of the option.

Fair Value of Common Stock

For valuations after the completion of our IPO, the fair value of each share of underlying common stock is based on the closing price of our common stock as reported on the Nasdaq Global Select Market on the date of grant.

Leases

We adopted Accounting Standards Update ("ASU") 2016-02, Leases (Topic 842) on January 1, 2021, using the modified retrospective transition approach. There was no cumulative-effect adjustment recorded to retained earnings upon adoption.

Under ASC 842, we assess all arrangements that convey the right to control the use of property, plant and equipment, at inception, to determine if it is, or contains, a lease based on the unique facts and circumstances present in the arrangements. In addition, we determine whether leases meet the classification criteria of a finance or operating lease at the lease commencement date considering: (i) whether the lease transfers ownership of the underlying asset to the lessee at the end of the lease term, (ii) whether the lease contains a bargain purchase option, (iii) whether the lease term is for a major part of the remaining economic life of the underlying asset, (iv) whether the present value of the sum of the lease payments and residual value guaranteed by the lessee equals or exceeds substantially all of the fair value of the underlying asset, and (v) whether the underlying asset is of such a specialized nature that it is expected to have no alternative use to the lessor at the end of the lease term. As of December 31, 2023, our lease population consisted only of operating real estate leases.

Once a lease is identified and its classification determined, we recognize a ROU asset, and a corresponding lease liability. Lease liabilities are recorded based on the present value of lease payments over the expected lease term. The corresponding ROU asset is measured from the initial lease liability, adjusted by (i) accrued or prepaid rents, (ii) remaining unamortized initial direct costs and lease incentives, and (iii) any impairments of the ROU asset.

Significant assumptions utilized in recognizing the ROU assets and corresponding lease liabilities included the expected lease term and the incremental borrowing rate. The expected lease term includes both contractual lease periods and, as applicable, extensions of the lease term when we have determined the exercise of the option to extend is reasonably certain to occur. The incremental borrowing rate was utilized to discount lease payments over the expected term given our operating leases do not provide an implicit rate. We estimated the incremental borrowing rate based on an analysis of corporate bond yields with a credit rating similar to ours. The determination of our incremental borrowing rate requires management judgment, including development of a synthetic credit rating and cost of debt, as we currently do not carry any debt. We believe that the estimates used in determining the incremental borrowing rate are reasonable based upon current facts and circumstances.

For additional details regarding the impact of adoption and disclosure, see Note 6, “Leases,” to our consolidated financial statements included in Part II, Item 8 of this Annual Report on Form 10-K.

Recently Adopted Accounting Pronouncements

See Note 2, “Basis of Presentation and Summary of Significant Accounting Policies,” to our consolidated financial statements for additional information.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk.

Interest Rate Risk

Our cash and cash equivalents as of December 31, 2023 and December 31, 2022 consisted of readily available checking and money market funds. As of December 31, 2023, we also invested in U.S. Treasury securities, U.S. government agency securities, corporate debt, commercial paper and asset-backed securities. Our primary exposure to market risk is interest rate sensitivity, which is affected by changes in the general level of U.S. interest rates. We do not believe that our cash and cash equivalents have significant risk of default or illiquidity. As of December 31, 2023 and 2022, we had approximately $1,242.9 million and $957.9 million in cash and investments, respectively. For the years ended December 31, 2023 and 2022, we had interest income of $62.9 million and $8.4 million, respectively. The following table shows the impact of a hypothetical 10% increase or decrease in interest rates on our net assets as of December 31, 2023 and our net loss for the year then ended:

Hypothetical Change in Interest Rates	Impact on Net Assets as of December 31, 2023	Impact on Net Loss for the year ended December 31, 2023
	(in thousands)	
10% increase	$ 5,257	$ 5,590
10% decrease	$ (5,257)	$ (5,590)

Concentrations of Credit Risk

Financial instruments that potentially subject us to a concentration of credit risk consist primarily of cash, cash equivalents and investments. We invest in money market funds, U.S. Treasury securities, U.S. government agency securities, corporate debt, commercial paper and asset-backed securities. We maintain bank deposits in federally insured financial institutions and these deposits may exceed federally insured limits. We are exposed to credit risk in the event of a default by the financial institutions holding our cash and issuers of investments to the extent recorded on the condensed balance sheets. For example, on March 10, 2023, the California Department of Financial Protection and Innovation took control of Silicon Valley Bank (“SVB”) and appointed the

Federal Deposit Insurance Corporation ("FDIC") as receiver. While SVB was our primary bank at the time, we maintained banking relationships with other major banks. The substantial majority of funds we held at SVB, which included cash, cash equivalents and investments, were held in custodial accounts of a third-party institution for which SVB Asset Management was the advisor ("SVB Custodial Accounts"). On March 12, 2023, the FDIC confirmed that depositors of SVB would have access to all of their money and, as a result, we regained access to all of our funds deposited with SVB. The FDIC subsequently transferred SVB's deposits and loans to a newly created bridge bank, named Silicon Valley Bridge Bank, N.A. ("Silicon Valley Bridge Bank"). On March 26, 2023, the FDIC announced that First Citizens Bank & Trust Company ("First Citizens Bank") had agreed to purchase and assume all deposits and loans of Silicon Valley Bridge Bank. Management believes that we are not exposed to significant credit risk as our deposits are held at First Citizens Bank, and our investments are held under separate financial institution custodial accounts, each of which management continues to believe to be of high credit quality. We have not experienced any losses on these deposits or investments as a result of this market event. While we were able to recover all deposited amounts from SVB, and continue to have access to all investments held in the SVB Custodial Accounts, there can be no assurance that our current or future banks will not face similar risks as SVB or that we will be able to recover in full our deposits in the event of similar closures. Our investment policy limits investments to money market funds, certain types of debt securities issued by the U.S. Government and its agencies, corporate debt, commercial paper and asset-backed securities, and places restrictions on the credit ratings, maturities and concentration by type and issuer. We believe that our exposure to credit risks is not significant and that a hypothetical 10% change in credit rates would not have a significant impact on our portfolio.

Foreign Currency Risk

We are exposed to market risk related to changes in foreign currency exchange rates, mainly relating to our contract with Lonza, our CMO in Switzerland. We have also entered into a limited number of contracts with other parties with payments denominated in foreign currencies. Payments under these contracts are made in foreign currencies and are subject to fluctuations in foreign currency rates. We do not currently have a formal program in place to hedge foreign currency risks. However, from time to time, we buy Swiss Francs ("CHF"), which is the majority of our foreign currency exposure, at market and are holding CHF in our bank accounts. As of December 31, 2023 and December 31, 2022, we held approximately $7.6 million and $21.8 million of CHF cash and cash equivalents, respectively, at one financial institution. As of December 31, 2023 and December 31, 2022, we had foreign currency denominated accounts payable and accrued expenses of $60.2 million and $13.9 million, respectively. As of December 31, 2023 and December 31, 2022, we had foreign currency denominated property, plant and equipment of $51.8 million and $0, respectively. As of December 31, 2023 and December 31, 2022, we had foreign currency denominated other assets of $37.5 million and $0, respectively. To date, foreign currency transaction gains and losses have not been material to our consolidated financial statements. The following table shows the impact of a hypothetical 10% increase or decrease in current exchange rates on our net assets as of December 31, 2023 and our net loss for the twelve months ended December 31, 2023:

	Impact on Net Assets as of December 31, 2023	Impact on Net Loss for the year ended December 31, 2023
	(in thousands)	
Hypothetical Change in Currency Exchange Rates		
10% increase	$ (2,091)	$ 3,726
10% decrease	$ 2,091	$ (3,726)

As our foreign currency risk increases in the future, we will evaluate alternative strategies, including hedging, to mitigate our foreign currency exposure.

Effects of Inflation

Recently, the rate of inflation in the United States has risen to levels not experienced in decades. Inflation generally affects us by increasing our cost of labor and research and development contract costs. The extent of any future impacts from inflation on our business and our results of operations will be dependent upon how long

the elevated inflation levels persist or if the rate of inflation were to accelerate, neither of which we are able to predict. If elevated levels of inflation were to persist or if the rate of inflation were to accelerate, the purchasing power of our cash and cash equivalents may be eroded, our expenses could increase faster than anticipated or we may utilize our capital resources sooner than expected. We do not believe inflation had a material effect on our consolidated results of operations during the periods presented.

Item 8. Consolidated Financial Statements and Supplementary Data.

INDEX TO CONSOLIDATED FINANCIAL STATEMENTS

Report of Independent Registered Public Accounting Firm

To the stockholders and the Board of Directors of Vaxcyte, Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Vaxcyte, Inc. and subsidiary (the "Company") as of December 31, 2023 and 2022, the related consolidated statements of operations, comprehensive loss, stockholders' equity, and cash flows, for each of the three years in the period ended December 31, 2023, and the related notes (collectively referred to as the "financial statements"). In our opinion, the financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2023 and 2022, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2023, in conformity with accounting principles generally accepted in the United States of America.

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2023, based on criteria established in Internal Control — Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission and our report dated February 27, 2024, expressed an unqualified opinion on the Company's internal control over financial reporting.

Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audits. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

Critical Audit Matter

The critical audit matter communicated below is a matter arising from the current-period audit of the financial statements that was communicated or required to be communicated to the audit committee and that (1) relates to accounts or disclosures that are material to the financial statements and (2) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the financial statements, taken as a whole, and we are not, by communicating the critical audit matter below, providing a separate opinion on the critical audit matter or on the accounts or disclosures to which it relates.

Accrued Manufacturing Expenses — Refer to Notes 2 and 7 to the financial statements

Critical Audit Matter Description

The Company incurs research and development expenses related to the costs of research and development activities, including those performed by Lonza, a contract manufacturing organization, under development and manufacturing services agreements, to provide research and development services related to preclinical vaccine development. At the end of each period, the Company accrues for costs related to manufacturing expenses based on their estimates of the services received for each phase and efforts expended pursuant to quotes and contracts with vendors that conduct research and development on their behalf. This estimation process involves reviewing open contracts and purchase orders, communicating with Company personnel and third parties to identify services that have been performed on their behalf, and estimating the level of service performed and the associated costs incurred for the services for each phase when the Company has not yet been invoiced or otherwise notified of the actual costs.

We identified the Company's accrued manufacturing expenses as a critical audit matter primarily due to judgments necessary for management to estimate the cost of services provided but not yet invoiced and the significant volume of transactions. The amount of the accrual at period end is based on the terms and conditions per the agreements and is dependent on management's gathering of information from various sources, including Lonza, regarding the progress of the uninvoiced services at the reporting date. Accordingly, this estimate is subjective as it involves management's judgment to analyze the various sources of information. This required extensive audit effort due to the volume and nature of available information from various sources, including Lonza, and required a high degree of auditor judgment when performing audit procedures to audit management's estimates of accrued manufacturing expenses and evaluating the results of those procedures.

How the Critical Audit Matter Was Addressed in the Audit

Our audit procedures related to the accrued manufacturing expenses included the following, among others:

- We tested the effectiveness of controls over the Company's accrued manufacturing expense process, including controls over the estimation of activities completed to date.
- We met with internal research and development personnel and inspected Board of Directors materials to understand the status of contract manufacturing activities. We then compared this information to the judgment applied in management's estimate of the recorded expenses and corresponding accrual.
- We evaluated the completeness of phases used by the Company by comparing to the tracker obtained from Lonza, as Lonza is the most significant contract manufacturer.
- For a sample of phases, we evaluated the accrued manufacturing expenses by:
    - Sending written confirmations directly to the contract manufacturing organization to confirm the total budgeted amount and percentage of completion incurred as of year-end.
    - Inspecting the development and manufacturing services agreement and related amendments, change orders, statements of work, and agreeing key provisions of the agreements including timeline, budget, and relevant rates, to the Company's analysis of estimated expenses incurred to date.
    - Obtaining invoices, if available, for each selection to substantiate when the transaction should have been recorded.
    - Obtaining cash disbursements to test the accuracy of the accrual.

- Performing a lookback analysis by comparing the estimated accrual balance as of December 31, 2022, to the invoices received after year-end to evaluate the Company's ability to estimate the accrual.

/s/ Deloitte & Touche LLP

San Francisco, California
February 27, 2024

We have served as the Company's auditor since 2017.

VAXCYTE, INC.
Consolidated Balance Sheets
(in thousands, except share and per share data)

	December 31,	
	2023	**2022**
Assets		
Current assets:		
Cash and cash equivalents	$ 397,451	$ 834,657
Short-term investments	682,776	96,719
Prepaid expenses and other current assets	15,727	11,179
Total current assets	1,095,954	942,555
Property and equipment, net	79,626	10,360
Operating lease right-of-use assets	30,997	21,288
Long-term investments	162,675	26,549
Restricted cash	1,103	871
Other assets	37,562	4,555
Total noncurrent assets	311,963	63,623
Total assets	$ 1,407,917	$ 1,006,178
Liabilities and Stockholders' Equity		
Current liabilities:		
Accounts payable	$ 14,587	$ 9,795
Accrued compensation	11,056	1,180
Accrued manufacturing expenses	52,767	8,265
Accrued expenses	59,815	15,375
Operating lease liabilities — current	7,113	5,910
Total current liabilities	145,338	40,525
Operating lease liabilities — long-term	22,111	12,031
Other liabilities	—	9
Total liabilities	167,449	52,565
Commitments and contingencies (Note 7)		
Stockholders' Equity		
Preferred stock, $0.001 par value — 10,000,000 authorized at December 31, 2023 and December 31, 2022; no shares issued and outstanding at December 31, 2023 and December 31, 2022	—	—
Common stock, $0.001 par value — 500,000,000 shares authorized at December 31, 2023 and December 31, 2022; 95,364,831 and 79,470,670 shares issued and outstanding at December 31, 2023 and December 31, 2022, respectively	98	82
Additional paid-in capital	2,164,583	1,476,018
Accumulated other comprehensive income (loss)	179	(361)
Accumulated deficit	(924,392)	(522,126)
Total stockholders' equity	1,240,468	953,613
Total liabilities and stockholders' equity	$ 1,407,917	$ 1,006,178

The accompanying notes are an integral part of these consolidated financial statements.

VAXCYTE, INC.
Consolidated Statements of Operations
(in thousands, except share and per share data)

	Year Ended December 31,		
	2023	**2022**	**2021**
Operating expenses:			
Research and development (including related party expenses of $0, $0 and $2,359 in 2023, 2022 and 2021, respectively)	$ 332,341	$ 169,451	$ 78,411
Acquired manufacturing rights (Note 7)	75,000	22,995	-
General and administrative	60,700	39,810	25,259
Total operating expenses	468,041	232,256	103,670
Loss from operations	(468,041)	(232,256)	(103,670)
Other income (expense), net:			
Interest expense	—	(2)	(7)
Interest income	62,907	8,356	344
Grant income	4,765	1,931	1,585
Realized gains on marketable securities	—	—	2
Loss on disposal of fixed assets	—	(44)	—
Foreign currency transaction (losses) gains	(1,897)	(1,470)	1,669
Total other income, net	65,775	8,771	3,593
Net loss	$ (402,266)	$ (223,485)	$ (100,077)
Net loss per share, basic and diluted	$ (4.14)	$ (3.44)	$ (1.93)
Weighted-average shares outstanding, basic and diluted	97,157,690	64,877,988	51,922,108

The accompanying notes are an integral part of these consolidated financial statements.

VAXCYTE, INC.
Consolidated Statements of Comprehensive Loss
(in thousands)

	Year Ended December 31,		
	2023	**2022**	**2021**
Net Loss	$ (402,266)	$ (223,485)	$ (100,077)
Other comprehensive loss:			
Unrealized gains (losses) on investments	538	(120)	(241)
Foreign currency translation adjustments, net	2	—	—
Comprehensive Loss	$ (401,726)	$ (223,605)	$ (100,318)

The accompanying notes are an integral part of these consolidated financial statements.

VAXCYTE, INC.
Consolidated Statements of Stockholders' Equity
(in thousands, except share data)

	Common Stock		Additional Paid-in Capital	Accumulated Deficit	Accumulated Other Comprehensive Income (Loss)	Total Stockholders' Equity
	Shares	Amount				
Balance — December 31, 2020	51,071,593	$ 54	$ 544,353	$ (198,564)	$ —	$ 345,843
Exercise of stock options	931,114	—	3,012	—	—	3,012
Issuance of common stock to Lonza Ltd.	399,680	1	10,000	—	—	10,001
Issuance of common stock in connection with at-the market offering, net of issuance costs of $479	567,045	1	13,846	—	—	13,847
Issuance of common stock under Employee Stock Purchase Plan	62,546	—	888	—	—	888
Vesting of early exercised stock options	—	—	16	—	—	16
Stock-based compensation expense	—	—	10,729	—	—	10,729
Unrealized losses on investment	—	—	—	—	(241)	(241)
Net loss	—	—	—	(100,077)	—	(100,077)
Balance — December 31, 2021	53,031,978	$ 56	$ 582,844	$ (298,641)	$ (241)	$ 284,018
Exercise of stock options	1,178,572	1	4,894	—	—	4,895
Issuance of common stock and pre-funded warrants in connection with public follow -on offerings, net of issuance costs of $45,814	21,062,500	21	759,160	—	—	759,181
Issuance of common stock in connection with at-the market offering, net of issuance costs of $3,107	3,921,528	4	97,295	—	—	97,299
Issuance of common stock for Sutro stock payment	167,780	—	7,995	—	—	7,995
Issuance of common stock under Employee Stock Purchase Plan	61,709	—	1,033	—	—	1,033
Release of restricted stock units	46,603	—	(861)	—	—	(861)
Vesting of early exercised stock options	—	—	8	—	—	8
Stock-based compensation expense	—	—	23,650	—	—	23,650
Unrealized losses on investment	—	—	—	—	(120)	(120)
Net loss	—	—	—	(223,485)	—	(223,485)
Balance — December 31, 2022	79,470,670	$ 82	$ 1,476,018	$ (522,126)	$ (361)	$ 953,613
Exercise of stock options	537,808	1	5,607	—	—	5,608
Issuance of common stock and pre-funded warrants in connection with public follow -on offerings, net of issuance costs of $29,952	13,030,000	13	545,289	—	—	545,302
Issuance of common stock in connection with at-the market offering, net of issuance costs of $2,237	2,095,943	2	90,739	—	—	90,741
Issuance of common stock under Employee Stock Purchase Plan	76,275	—	2,038	—	—	2,038
Release of restricted stock units	154,135	—	(3,876)	—	—	(3,876)
Vesting of early exercised stock options	—	—	8	—	—	8
Stock-based compensation expense		—	48,760	—	—	48,760
Unrealized gains on investment		—	—	—	538	538
Cumulative translation adjustment	—	—	—	—	2	2
Net loss				(402,266)		(402,266)
Balance — December 31, 2023	95,364,831	$ 98	$ 2,164,583	$ (924,392)	$ 179	$ 1,240,468

The accompanying notes are an integral part of these consolidated financial statements.

VAXCYTE, INC.
Consolidated Statements of Cash Flows
(in thousands)

	Year Ended December 31,		
	2023	**2022**	**2021**
Cash flows from operating activities:			
Net loss	$ (402,266)	$ (223,485)	$ (100,077)
Adjustments to reconcile net loss to net cash used in operating activities:			
Depreciation and amortization	3,156	2,577	1,800
Stock-based compensation expense	48,760	23,650	10,729
Non-cash payments for acquired manufacturing rights	—	7,995	—
Loss on disposal of assets	—	44	97
Asset impairment charges	—	213	—
Amortization of operating lease right-of-use assets	7,015	6,619	1,657
Net amortization (accretion) of premium (discounts) on investments	(34,775)	(947)	1,406
Changes in operating assets and liabilities:			
Prepaid expenses and other current assets	17,870	433	(7,369)
Operating lease right-of-use assets	(16,724)	—	—
Other assets	(33,007)	(465)	(3,539)
Operating lease liabilities	11,284	1,151	(12,856)
Accounts payable	11,225	2,896	(12,470)
Accrued compensation	9,876	(2,275)	3,170
Accrued manufacturing expenses	44,501	3,826	(8,572)
Accrued expenses	36,295	7,171	4,631
Net cash used in operating activities	(296,790)	(170,597)	(121,393)
Cash flows from investing activities:			
Purchases of property and equipment	(16,062)	(5,848)	(6,555)
Purchases of investments	(1,329,896)	(102,745)	(336,341)
Manufacturing facility and equipment construction-in-progress	(51,815)	—	—
Maturities of investments	611,876	168,691	100,500
Sales of investments	12,586	14,480	30,062
Proceeds from sales of property and equipment	—	7	26
Net cash (used in) provided by investing activities	(773,311)	74,585	(212,308)
Cash flows from financing activities:			
Proceeds from issuance of common stock and pre-funded warrants from follow-on offerings, net of issuance costs	545,302	759,181	—
Proceeds from issuance of common stock under ATM Sales Program, net of issuance costs	90,741	97,299	13,896
Proceeds from exercise of common stock options	5,608	4,895	3,012
Proceeds from issuance of common stock under Employee Stock Purchase Plan	2,038	1,033	888
Release of restricted stock units	(3,876)	(861)	—
Net cash provided by financing activities	639,813	861,547	17,796
Effect of exchange rate changes on cash and cash equivalents	(6,686)	137	(439)
Net (decrease) increase in cash, cash equivalents and restricted cash	(436,974)	765,672	(316,344)
Cash, cash equivalents and restricted cash, beginning of period	835,528	69,856	386,200
Cash, cash equivalents and restricted cash, end of period	$ 398,554	$ 835,528	$ 69,856
Supplemental disclosure of cash flow information:			
Cash paid for interest	$ —	$ 2	$ 7
Supplemental disclosures of non-cash investing and financing activities:			
Purchases of property and equipment recorded in accounts payable and accrued expenses	$ 8,510	$ 110	$ 766
Issuance of common stock for acquired manufacturing rights	$ —	$ 7,995	$ —
Stock issued for payment of accounts payable	$ —	$ —	$ 10,000

The accompanying notes are an integral part of these consolidated financial statements.

VAXCYTE, INC.
Notes to Consolidated Financial Statements

1. Company Organization and Nature of Business

Vaxcyte, Inc. and its wholly owned consolidated subsidiary, collectively referred to as any of "we," "us," "the Company," or "Vaxcyte," headquartered in San Carlos, California, was incorporated in the state of Delaware on November 27, 2013 as SutroVax, Inc. and we changed our name to Vaxcyte, Inc. on May 15, 2020. On October 25, 2023, we formed Vaxcyte Switzerland GmbH ("Vaxcyte GmbH"), a wholly owned Swiss subsidiary. We are a clinical-stage vaccine innovation company engineering high-fidelity vaccines to protect humankind from the consequences of bacterial diseases. We are developing broad-spectrum conjugate and novel protein vaccines to prevent or treat bacterial infectious diseases. We are re-engineering the way highly complex vaccines are made through modern synthetic techniques, including advanced chemistry and the XpressCF cell-free protein synthesis platform, exclusively licensed from Sutro Biopharma, Inc. ("Sutro Biopharma"). Unlike conventional cell-based approaches, our system for producing difficult-to-make proteins and antigens is intended to accelerate our ability to efficiently create and deliver high-fidelity vaccines with enhanced immunological benefits.

Our primary activities since incorporation have been to perform research and development, undertake preclinical and clinical studies and conduct manufacturing activities in support of our product development efforts; organize and staff our Company; establish our intellectual property portfolio; and raise capital to support and expand such activities.

2. Basis of Presentation and Summary of Significant Accounting Policies

Basis of Presentation and Principles of Consolidation

These consolidated financial statements have been prepared in accordance with accounting principles generally accepted in the United States of America ("U.S. GAAP") and applicable rules and regulations of the Securities and Exchange Commission (the "SEC") regarding annual reporting.

The consolidated financial statements include the Company and its wholly owned subsidiary. All intercompany transactions and balances have been eliminated upon consolidation.

Use of Estimates

The preparation of consolidated financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the reported amounts of assets, liabilities and expenses and the disclosure of contingent assets and liabilities at the date of the consolidated financial statements. On an ongoing basis, we evaluate our estimates and assumptions, including those related to stock-based compensation expense, accruals for certain research and development costs, the incremental borrowing rate, the valuation of deferred tax assets and income taxes. Management bases our estimates on historical experience and on various other assumptions that are believed to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ materially from those estimates.

Concentration of Credit Risk and Other Risks and Uncertainties

Financial instruments that potentially subject us to a concentration of credit risk consist primarily of cash, cash equivalents and investments. We invest in money market funds, U.S. Treasury securities, U.S. government agency securities, corporate debt, commercial paper and asset-backed securities. We maintain bank deposits in federally insured financial institutions and these deposits may exceed federally insured limits. We are exposed to credit risk in the event of a default by the financial institutions holding our cash and issuers of investments to the extent recorded on the consolidated balance sheets. For example, on March 10, 2023, the California Department of Financial Protection and Innovation took control of Silicon Valley Bank ("SVB") and appointed the Federal Deposit Insurance Corporation ("FDIC") as receiver. While SVB was our primary bank at the time, we maintained banking relationships with other major banks. The substantial majority of funds we held at

SVB, which included cash, cash equivalents and investments, were held in custodial accounts of a third-party institution for which SVB Asset Management was the advisor ("SVB Custodial Accounts"). On March 12, 2023, the FDIC confirmed that depositors of SVB would have access to all of their money and, as a result, we regained access to all of our funds deposited with SVB. The FDIC subsequently transferred SVB's deposits and loans to a newly created bridge bank, named Silicon Valley Bridge Bank, N.A. ("Silicon Valley Bridge Bank"). On March 26, 2023, the FDIC announced that First Citizens Bank & Trust Company ("First Citizens Bank") had agreed to purchase and assume all deposits and loans of Silicon Valley Bridge Bank. We have not experienced any losses on these deposits or investments as a result of this market event. While we were able to recover all deposited amounts from SVB, and continue to have access to all investments held in the SVB Custodial Accounts, there can be no assurance that our current or future banks will not face similar risks as SVB or that we will be able to recover in full our deposits in the event of similar closures. Our investment policy limits investments to money market funds, certain types of debt securities issued by the U.S. Government and its agencies, corporate debt, commercial paper and asset-backed securities, and places restrictions on the credit ratings, maturities and concentration by type and issuer. We have not experienced any significant losses on our deposits of cash, cash equivalents or investments.

We are subject to supplier concentration risk from certain vendors. Although we are working to establish secondary sources of supply, we currently source several of our critical raw materials from single-source suppliers. We also use one contract manufacturing organization ("CMO"), Lonza Ltd. ("Lonza"), to handle most of our manufacturing activities for our VAX-24 and VAX-31 programs. If we were to experience disruptions in raw materials supplied by our suppliers, or in manufacturing activities at Lonza, we may experience significant delays in our product development timelines and may incur substantial costs to secure alternative sources of raw materials or manufacturing.

Our future results of operations involve a number of other risks and uncertainties. Factors that could affect our future operating results and cause actual results to vary materially from expectations include, but are not limited to: our early stages of clinical vaccine development; our ability to advance vaccine candidates into, and successfully complete, clinical trials on the timelines we project; our ability to adequately demonstrate sufficient safety and immunogenicity or efficacy of our vaccine candidates; our ability to enroll subjects in our ongoing and future clinical trials; our ability to successfully manufacture and supply our vaccine candidates for clinical trials or for future potential commercialization; our ability to obtain additional capital to finance our operations; our ability to obtain, maintain and protect our intellectual property rights; developments relating to our competitors and our industry, including competing vaccine candidates; general and market conditions; and other risks and uncertainties, including those more fully described in the "Risk Factors" section of this Annual Report on Form 10-K.

Segment and Geographical Information

We operate and manage our business as one reportable and operating segment. Our chief executive officer, who is the chief operating decision maker, reviews financial information on an aggregate basis for purposes of allocating resources and evaluating financial performance. Most of our long-lived assets are based in the United States. Long-lived assets are comprised of property and equipment.

Cash, Cash Equivalents and Restricted Cash

We consider all highly liquid investments purchased with original maturities of three months or less from the date of purchase to be cash equivalents. Cash equivalents consist primarily of amounts invested in money market funds and commercial paper and are stated at their fair values. Restricted cash consists of two standby letters of credit that serve as collateral for the lease agreements for our current corporate headquarters. Cash, cash equivalents and restricted cash as reported within the consolidated statements of cash flows consisted of the following:

	Years Ended December 31,	
	2023	2022
	(in thousands)	
Cash and cash equivalents	$ 397,451	$ 834,657
Restricted cash	1,103	871
Cash, cash equivalents and restricted cash	$ 398,554	$ 835,528

Investments

Our investments have been classified and accounted for as available-for-sale securities. Fixed income securities consist of U.S. Treasury securities, U.S. government agency securities, corporate debt, commercial paper and asset-backed securities. These securities are recorded on the consolidated balance sheets at fair value. Unrealized gains and losses on these securities are included as a separate component of accumulated other comprehensive gain (loss). The cost of investment securities is adjusted for amortization of premiums and accretion of discounts to maturity. Such amortization and accretion are included in other income (expense), net. Realized gains and losses are also included in other income (expense), net. When the fair value of a debt security declines below its amortized cost basis, any portion of that decline attributable to credit losses, to the extent expected to be nonrecoverable before the sale of the security, is recognized in our consolidated statements of operations. When the fair value of a debt security declines below its amortized cost basis due to changes in interest rates, such amounts are recorded in other comprehensive loss, and are recognized in our consolidated statements of operations only if we sell or intend to sell the security before recovery of its cost basis.

Property and Equipment, Net

Property and equipment are stated at cost, less accumulated depreciation and amortization. Depreciation is computed using the straight-line method over the estimated useful lives of the assets, generally three to five years. Leasehold improvements are amortized over the shorter of the expected life or lease term. Repairs and maintenance expenditures, which are not considered improvements and do not extend the useful life of property and equipment, are expensed as incurred. When assets are retired or otherwise disposed of, the cost and related accumulated depreciation and amortization are removed from the consolidated balance sheets and the resulting gain or loss is reflected in the consolidated statements of operations in the period realized.

Leases

We determine if an arrangement is a lease at inception. In addition, we determine whether a lease meets the classification criteria of a finance or operating lease at the lease commencement date considering whether: (i) the lease transfers ownership of the underlying asset to the lessee at the end of the lease term; (ii) the lease grants the lessee an option to purchase the underlying asset that the lessee is reasonably certain to exercise; (iii) the lease term is for a major part of the remaining economic life of the underlying asset; (iv) the present value of the sum of the lease payments and residual value guaranteed by the lessee equals or exceeds substantially all of the fair value of the underlying asset; and (v) the underlying asset is such a specialized nature that it is expected to have no alternative use to the lessor at the end of the lease term. As of December 31, 2023 and 2022, our lease population consisted of real estate operating leases and we did not have any finance leases.

Operating leases are included in Operating lease right-of-use (“ROU”) assets, Operating lease liabilities — current and Operating lease liabilities — long term in our consolidated balance sheets. ROU assets represent our right to use the underlying assets for the lease term and lease liabilities represent our obligation to make lease payments arising from the leases. Operating lease ROU assets and liabilities are recognized at the lease commencement date based on the present value of lease payments over the lease term. In determining the present value of lease payments, if the rate implicit in the lease is not readily determinable, we use our incremental borrowing rate based on the information available at the lease commencement date. We determine the incremental borrowing rate based on an analysis of corporate bond yields with a credit rating similar to ours. The determination of our incremental borrowing rate requires management judgment, including development of a synthetic credit rating and cost of debt, as we currently do not carry any debt. We believe that the estimates used in determining the incremental borrowing rate are reasonable based upon current facts and circumstances. Applying different judgment to the same facts and circumstances could yield a different incremental borrowing rate. The operating lease ROU assets also include adjustments for prepayments and accrued lease payments and exclude lease incentives. ROU assets and lease liabilities may include options to extend or terminate leases if it is reasonably certain that we will exercise such options. Lease payments which are fixed and determinable are amortized as rent expense on a straight-line basis over the expected lease term. Variable lease costs, which are dependent on usage, a rate or index, including common area maintenance charges, are expensed as incurred. Lease agreements that include lease and non-lease components are accounted for as a single lease component. Lease agreements with non-cancelable terms of less than 12 months are not recorded on our consolidated balance sheets.

Impairment of Long-Lived Assets

We review long-lived assets for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset may not be recoverable. Recoverability is measured by comparing the carrying amount to the future undiscounted net cash flows which the assets are expected to generate. If such assets are considered to be impaired, the impairment to be recognized is measured as the amount by which the carrying amount of the assets exceeds the projected discounted future net cash flows generated by the assets. There were $0 million, $0.2 and $0 million of impairments of long-lived assets during the years ended December 31, 2023, 2022 and 2021, respectively.

Fair Value Measurements

Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. As such, fair value is a market-based measurement that should be determined based on assumptions that market participants would use in pricing an asset or liability. The carrying amounts of our financial instruments, including cash and cash equivalents, prepaid and other current assets, accounts payable, accrued expenses, and other liabilities, approximate fair value due to their short-term maturities.

Research and Development

Research and development costs are expensed as incurred. Research and development costs include salaries, stock-based compensation and benefits for employees performing research and development activities, an allocation of facility and overhead expenses, expenses incurred under agreements with consultants, CMOs, contract research organizations ("CROs") and investigative sites that conduct preclinical studies, clinical trials other supplies and costs associated with product development efforts, preclinical activities, clinical trials and regulatory operations.

Accrued Research and Development

We have entered into various agreements with CROs and CMOs. Our research and development accruals, which include accrued manufacturing expenses, are estimated based on the level of services performed, progress of the studies, including the phase or completion of events, and contracted costs. The estimated costs of research and development services provided, but not yet invoiced, are included in accrued expenses on the consolidated balance sheets. If the actual timing of the performance of services or the level of effort varies from the original estimates, we adjust the accrual accordingly. Payments made to CROs or CMOs under these arrangements in advance of the performance of the related services are recorded as prepaid expenses and other current assets until the services are rendered. To date, there have been no material differences between our estimates of such expenses and the amounts actually incurred.

Acquired Manufacturing Rights

In December 2022, we entered into an option agreement with Sutro Biopharma (the "Option Agreement"). The Option Agreement we acquired, among other things, a right, but not an obligation, to obtain certain exclusive rights to internally manufacture and/or source extract from certain CMOs and the right to independently develop and make improvements to the extract for use in connection with the exploitation of certain vaccine compositions (the "Option"). As consideration for the Option and other rights and authorizations granted to us under the Option Agreement, we paid Sutro Biopharma upfront consideration. In September 2023, we and Sutro Biopharma mutually agreed in writing to the Form Definitive Agreement (as defined below) to become effective in the event we exercised the Option, and paid Sutro Biopharma the amount due upon mutual agreement of the Form Definitive Agreement. In November 2023, we exercised the Option and paid the Option exercise price and accrued the remaining payment we are obligated to pay Sutro Biopharma. As of December 31, 2022 and 2023, we have determined there is no current alternative future use of the acquired manufacturing rights paid and expensed the Option as of December 31, 2022 and 2023. We have classified such costs incurred related to the execution of the Option Agreement, the mutual agreement of the Form Definitive Agreement and the Option exercise, as Acquired Manufacturing Rights on the accompanying consolidated statements of operations for the years ended December 31,

2022 and 2023, respectively. See Note 7, “Commitments and Contingencies, Sutro Option Agreement,” for further details.

Income Taxes

We account for income taxes using the asset and liability method. We recognize deferred tax assets and liabilities for the expected future tax consequences of events that have been included in the consolidated financial statements or tax returns. Deferred tax assets and liabilities are determined based on the difference between the consolidated financial statements and tax basis of assets and liabilities using enacted tax rates in effect for the year in which the differences are expected to reverse.

In evaluating the ability to recover our deferred income tax assets, we consider all available positive and negative evidence, including our operating results, ongoing tax planning and forecasts of future taxable income on a jurisdiction-by-jurisdiction basis. In the event we determine that we would be able to realize our deferred income tax assets in the future in excess of their net recorded amount, we would make an adjustment to the valuation allowance that would reduce the provision for income taxes. Conversely, in the event that all or part of the net deferred tax assets are determined not to be realizable in the future, an adjustment to the valuation allowance would be charged to earnings in the period when such determination is made. As of December 31, 2023 and 2022, we have recorded a full valuation allowance on our deferred tax assets.

Tax benefits related to uncertain tax positions are recognized when it is more likely than not that a tax position will be sustained during an audit. Interest and penalties related to unrecognized tax benefits are included within the provision for income tax.

Stock-Based Compensation Expense

For options granted to employees, non-employees and directors, stock-based compensation is measured at grant date based on the fair value of the award. We determine the grant-date fair value of the options using the Black-Scholes option-pricing model. The fair value of restricted stock and restricted stock unit (“RSU”) awards is determined based on the number of units granted and the closing price of the Company’s common stock as of the grant-date. The grant-date fair value of awards is amortized over the employees’ requisite service period or the non-employees’ vesting period as the services are rendered. Forfeitures are accounted for as they occur. Additionally, our 2020 Employee Stock Purchase Plan is deemed to be a compensatory plan and is therefore included in stock-based compensation expense.

Comprehensive Loss

Comprehensive loss includes net loss and other comprehensive loss for the period. Other comprehensive loss consists of unrealized loss on investments and foreign currency translation adjustments, net.

Foreign Currency Transactions

Transactions denominated in foreign currencies are initially measured in U.S. dollars using the exchange rate on the date of the transaction. Foreign currency denominated monetary assets and liabilities are subsequently re-measured at the end of each reporting period using the exchange rate at that date, with the corresponding foreign currency transaction gain or loss recorded in the consolidated statements of operations and consolidated statements of cash flows. Nonmonetary assets and liabilities are not subsequently re-measured.

For our international operations, local currencies have been determined to be the functional currencies. We translate functional currency assets and liabilities to their U.S. dollar equivalents at exchange rates in effect as of the balance sheet date and income and expense amounts at average exchange rates for the period. Gains and losses from foreign currency translation are included in accumulated other comprehensive loss within stockholders’ equity in the consolidated balance sheets.

Net Loss Per Share

Basic net loss per common share is calculated by dividing the net loss attributable to common stockholders by the weighted-average number of common stock outstanding, including pre-funded warrants, during the period, without consideration of potentially dilutive securities. Diluted net loss per share is computed by dividing the net loss attributable to common stockholders by the weighted-average number of common stock and potentially dilutive securities outstanding for the period. For purposes of the diluted net loss per share calculation, common stock subject to repurchase, and stock options are considered to be potentially dilutive securities. Shares of common stock into which the pre-funded warrants may be exercised are considered outstanding for the purposes of computing net loss per share because the shares may be issued for little consideration, are fully vested and are exercisable after the original issuance date.

Basic and diluted net loss attributable to common stockholders per share is presented in conformity with the two-class method required for participating securities as the redeemable convertible preferred stock is considered a participating security. Our participating securities do not have a contractual obligation to share in our losses. As such, the net loss was attributed entirely to common stockholders. Because we have reported a net loss for all periods presented, diluted net loss per common share is the same as basic net loss per common share for those periods.

Recently Issued Accounting Standards Not Yet Adopted

From time to time, new accounting pronouncements are issued by the Financial Accounting Standards Board ("FASB") or other standard setting bodies and adopted by us as of the specified effective date. We believe that the impact of recently issued standards that are not yet effective will not have a material impact on our consolidated financial statements and disclosures.

In November 2023, the FASB issued Accounting Standards Update ("ASU") No. 2023-07: Segment Reporting (Topic 280): Improvements to Reportable Segment Disclosures. The ASU requires entities to report incremental information about significant segment expenses included in a segment's profit or loss measure as well as the name and title of the chief operating decision maker. The guidance also requires interim disclosures related to reportable segment profit or loss and assets that had previously only been disclosed annually. This guidance is effective for annual periods beginning after December 15, 2024. We are currently evaluating the impact of the new guidance on the disclosures to our consolidated financial statements.

In December 2023, the FASB issued ASU No. 2023-09: Income Taxes (Topic 740): Improvements to Income Tax Disclosures. The ASU improves the transparency of income tax disclosures by requiring (i) consistent categories and greater disaggregation of information in the rate reconciliation and (ii) income taxes paid disaggregated by jurisdiction. This guidance is effective for fiscal years beginning after December 15, 2024 on a prospective basis and retrospective application is permitted. We are currently evaluating the impact of the new guidance on the disclosures to our consolidated financial statements.

3. Fair Value Measurements and Fair Value of Financial Instruments

Assets and liabilities recorded at fair value on a recurring basis in the consolidated balance sheets, as well as assets and liabilities measured at fair value on a non-recurring basis or disclosed at fair value, are categorized based upon the level of judgment associated with inputs used to measure their fair values. The accounting guidance for fair value provides a framework for measuring fair value and requires certain disclosures about how fair value is determined. Fair value is defined as the price that would be received upon the sale of an asset or paid to transfer a liability (an exit price) in an orderly transaction between market participants at the reporting date. The accounting guidance also establishes a three-level valuation hierarchy that prioritizes the inputs to valuation techniques used to measure fair value based upon whether such inputs are observable or unobservable. Observable inputs reflect market

data obtained from independent sources, while unobservable inputs reflect market assumptions made by the reporting entity. The three-level hierarchy for the inputs to valuation techniques is briefly summarized as follows:

Level 1—Inputs are unadjusted, quoted prices in active markets for identical assets or liabilities at the measurement date;

Level 2—Inputs are observable, unadjusted quoted prices in active markets for similar assets or liabilities, unadjusted quoted prices for identical or similar assets or liabilities in markets that are not active, or other inputs that are observable or can be corroborated by observable market data for substantially the full term of the related assets or liabilities; and

Level 3—Unobservable inputs that are significant to the measurement of the fair value of the assets or liabilities that are supported by little or no market data.

Assets and liabilities measured at fair value are classified in their entirety based on the lowest level of input that is significant to the fair value measurement. Our assessment of the significance of a particular input to the fair value measurement in its entirety requires management to make judgments and consider factors specific to the asset or liability. Changes in the ability to observe valuation inputs may result in a reclassification of levels of certain securities within the fair value hierarchy. We recognize transfers into and out of levels within the fair value hierarchy in the period in which the actual event or change in circumstances that caused the transfer occurs.

Level 1 securities consist of highly liquid money market funds for which the carrying amounts approximate their fair values due to their short maturities. U.S. Treasury securities are valued using Level 1 inputs based on unadjusted, quoted prices in active markets that are observable at the measurement date for identical assets or liabilities. Level 2 securities, consisting of corporate debt, commercial paper, U.S. government agency securities and asset-backed securities, are measured based on other observable inputs, including broker or dealer quotations or alternative pricing sources. When quoted prices in active markets for identical assets or liabilities are not available, we rely on non-binding quotes from our investment managers, which are based on proprietary valuation models of independent pricing services. These models generally use inputs such as observable market data, quoted market prices for similar instruments or historical pricing trends of securities relative to our peers. To validate the fair value determinations provided by our investment managers, we review the pricing movement in the context of overall market trends and trading information from our investment managers. In addition, we assess the inputs and methods used in determining the fair value in order to determine the classification of securities in the fair value hierarchy. We had no Level 3 securities either as of December 31, 2023 or 2022.

There were no transfers within the hierarchies during the years ended December 31, 2023 or 2022.

The following tables set forth our financial instruments measured at fair value on a recurring basis by level within the fair value hierarchy at December 31, 2023 and 2022:

	Fair Value Hierarchy Level	December 31, 2023 Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value
Assets			(in thousands)		
Cash and cash equivalents:					
Cash	Level 1	$ 50,003	$ —	$ —	$ 50,003
Money market funds	Level 1	47,357	—	—	47,357
Commercial paper	Level 2	300,256	—	(165)	300,091
Total cash and cash equivalents		397,616	—	(165)	397,451
Investments:					
U.S. Treasury securities	Level 1	481,704	422	(44)	482,082
Commercial paper	Level 2	102,435	7	(35)	102,407
Corporate debt	Level 2	133,523	168	(42)	133,649
Asset backed securities	Level 2	23,963	18	—	23,981
U.S. government agency securities	Level 2	103,484	—	(152)	103,332
Total investments		845,109	615	(273)	845,451
Total assets measured at fair value		$ 1,242,725	$ 615	$ (438)	$ 1,242,902

	Fair Value Hierarchy Level	December 31, 2022 Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value
Assets			(in thousands)		
Cash and cash equivalents:					
Cash	Level 1	$ 56,198	$ —	$ —	$ 56,198
Money market funds	Level 1	680,934	—	—	680,934
Commercial paper	Level 2	92,581	—	(34)	92,547
U.S. government agency securities	Level 2	4,978	—	—	4,978
Total cash and cash equivalents		834,691	—	(34)	834,657
Investments:					
U.S. Treasury securities	Level 1	37,651	—	(70)	37,581
Commercial paper	Level 2	28,161	—	(17)	28,144
Corporate debt	Level 2	25,402	—	(131)	25,271
Asset backed securities	Level 2	6,954	20	—	6,974
U.S. government agency securities	Level 2	25,427	19	(148)	25,298
Total investments		123,595	39	(366)	123,268
Total assets measured at fair value		$ 958,286	$ 39	$ (400)	$ 957,925

The following table presents the contractual maturities of our investments as of December 31, 2023 (in thousands):

	December 31, 2023 Fair Value
Due in less than one year	$ 682,776
Due in one to five years	162,675
Total	$ 845,451

4. Commercial Manufacturing and Supply Agreement

On October 13, 2023, Vaxcyte GmbH, a Swiss limited liability company and wholly owned subsidiary of ours, entered into a pre-commercial services and commercial manufacturing supply agreement with Lonza (the "Commercial Manufacturing and Supply Agreement").

Pursuant to the Commercial Manufacturing and Supply Agreement, Lonza will (i) construct and build out a dedicated suite (the "Suite") at Lonza's facilities in Visp, Switzerland to manufacture certain key components (including drug substance) for our proprietary PCV franchise and any other products or intermediates Vaxcyte GmbH may choose (collectively, the "Products") and (ii) maintain and operate the Suite (utilizing Lonza's employees) to manufacture the Products as a service provided to Vaxcyte GmbH, including conducting related quality control and quality assurance operations. Lonza will be a preferred, non-exclusive, supplier of the Products to Vaxcyte GmbH, and Vaxcyte GmbH retains the right to procure the Products from one or more alternate and/or backup manufacturers of the Products (including at our own facilities).

Under the Commercial Manufacturing and Supply Agreement, prior to completion of construction and certification of the Suite for commercial operation, Vaxcyte GmbH will contribute to the capital expenditure costs to construct the Suite (and will own certain equipment in the Suite to be purchased or otherwise acquired by Vaxcyte GmbH), and will pay Lonza a fixed-rate monthly service fee for Lonza's pre-commercial services prior to commencement of commercial operations (which monthly service fee amount is subject to increases in subsequent years). Following commencement of commercial operations of the Suite to manufacture the Products, Vaxcyte GmbH will pay Lonza (i) Suite fees based on allocations of certain of Lonza's costs to maintain the facility in which the Suite is located and to provide shared services to Vaxcyte GmbH and Lonza's other customers in such facility, (ii) service fees based upon Lonza's actual full-time equivalent employee ("FTE") costs to operate the Suite to manufacture the Products, and (iii) certain other pass-through costs, including for raw materials. In addition, Vaxcyte GmbH may be obligated to pay or reimburse Lonza for certain other fees and expenses under the Commercial Manufacturing and Supply Agreement. Lonza will be eligible for certain financial bonuses, and subject to certain financial penalties, as incentives for the timely completion of certain scale-up activities, receipt of certain regulatory approvals for the Suite and manufacture of the Products in accordance with Vaxcyte GmbH's commercial requirements.

Unless earlier terminated, the Commercial Manufacturing and Supply Agreement will remain in effect until December 31, 2038, subject to automatic renewal for up to three additional renewal periods of five years each, unless Vaxcyte GmbH elects not to renew (with 24 months advanced notice to Lonza). Vaxcyte GmbH is permitted to terminate the Commercial Manufacturing and Supply Agreement for convenience or for Lonza's uncured material breach, in each case subject to certain notice obligations. Lonza is permitted to terminate the Commercial Manufacturing and Supply Agreement in the event that Vaxcyte GmbH commits certain specified material breaches, including uncured failure to pay material, undisputed amounts of money due to Lonza, subject to certain notice obligations. Either party may terminate the Commercial Manufacturing and Supply Agreement in certain circumstances in the event of the other party's bankruptcy. In the event that Vaxcyte GmbH terminates the agreement for convenience, or Lonza terminates the agreement in the event that Vaxcyte GmbH commits certain specified material breaches, then certain termination consequences may be triggered, including that (i) Vaxcyte GmbH would forfeit any outstanding entitlement to credit from Lonza of the Repurposing Fee (as defined below), and (ii) Vaxcyte GmbH would be obligated to pay Lonza a termination penalty equal to the greater of (a) CHF 70,000,000, or (b) a prespecified number of months' FTE fees for the actual FTEs assigned to Vaxcyte GmbH as of the date of termination. Within 30 days of the Effective Date, Vaxcyte GmbH paid Lonza a repurposing fee (the "Repurposing Fee") of CHF 27,000,000 that will be credited back to Vaxcyte GmbH over a 10-year period starting upon commencement of commercial production. In the event of a termination under certain circumstances, Lonza shall be obligated to provide certain wind-down and transition services to Vaxcyte GmbH for up to 12 and 24 months, respectively.

Construction and buildout has commenced on the Suite and, as of December 31, 2023, we have incurred (i) $51.8 million of capital expenditures related to the facility buildout and equipment which is Vaxcyte owned and which have been recorded as manufacturing facility and equipment construction-in-progress under Property and equipment, net on our consolidated balance sheets (see Note 5 "Balance Sheet Details") and (ii) $34.7 million of facility buildout expenditures that are owned and controlled by Lonza, which have been accounted for as prepaid

lease payments within Other assets on our consolidated balance sheets, captioned as manufacturing facility construction buildout, and will be recorded as a right-of-use asset under ASC 842 lease accounting when the buildout of the Suite is complete and manufacturing activities commence, at which point we will control the Lonza owned Suite and pre-existing equipment (see Note 5 "Balance Sheet Details"). Included in the Lonza owned capital expenditures are pre-commercial services fees of CHF 3 million and the Repurposing Fee of CHF 27 million, which is intended to cover Lonza's expenses in making the Suite available to lease to other Lonza customers in the event of early termination by us.

5. Balance Sheet Details

Prepaid Expenses and Other Current Assets

Prepaid expenses and other current assets as of December 31, 2023 and 2022 consisted of the following:

	December 31, 2023	December 31, 2022
	(in thousands)	
Prepaid expenses	$ 6,159	$ 5,312
Purchased equipment deposits	3,856	—
Interest receivable	3,598	2,848
Grant receivable	9	1,029
Other current assets	2,105	1,990
Total	$ 15,727	$ 11,179

Property and Equipment, Net

Property and equipment, net as of December 31, 2023 and 2022 consisted of the following:

	December 31,	
	2023	2022
	(in thousands)	
Furniture and equipment	$ 1,608	$ 1,608
Computers and computer software	771	416
Lab equipment	25,110	13,100
Leasehold improvements	1,460	1,353
Manufacturing equipment and auxiliary	8,134	—
Manufacturing facility and equipment construction-in-progress [(1)]	51,815	—
Total property and equipment	88,898	16,477
Less: accumulated depreciation and amortization	(9,272)	(6,117)
Property and equipment, net	$ 79,626	$ 10,360

(1) See Note 4, "Commercial Manufacturing and Supply Agreement," for further details.

Depreciation and amortization expense for the years ended December 31, 2023, 2022 and 2021 was $3.2 million, $2.6 million and $1.8 million, respectively.

Other Assets

Other assets as of December 31, 2023 and 2022 consisted of the following:

	December 31, 2023	December 31, 2022
	(in thousands)	
Manufacturing facility construction buildout [(1)]	$ 34,688	$ —
Long-term prepaid assets	2,768	4,361
Other long-term assets	106	194
Total	$ 37,562	$ 4,555

(1) See Note 4, “Commercial Manufacturing and Supply Agreement,” for further details.

Accrued Expenses

Accrued expenses as of December 31, 2023 and 2022 consisted of the following:

	December 31,	
	2023	2022[2]
	(in thousands)	
Clinical studies	$ 2,156	$ 1,518
Other research and development	30,759	7,446
Acquired manufacturing rights [1]	25,000	5,000
Other accrued expenses	1,900	1,411
Total	$ 59,815	$ 15,375

(1) See Note 7, “Commitments and Contingencies, Sutro Option Agreement,” for further details.

(2) The breakout and categorizations of the 2022 total accrued expenses have been updated to conform to the 2023 presentation.

6. Leases

Operating Lease Obligations

In October 2023, we entered into the Commercial Manufacturing and Supply Agreement. We have concluded that this agreement contains an embedded lease and will be accounted for in accordance with Accounting Standards Codification (“ASC”) 842 Leases upon the commencement date. As of December 31, 2023, the lease had not commenced and, as such, no lease liability or ROU asset was recorded on the consolidated balance sheets and no operating lease expense was recorded on the consolidated statements of operations. See Note 4, “Commercial Manufacturing and Supply Agreement,” for further details.

In September 2023, we entered into an assignment and assumption of lease agreement (the “Assignment Agreement”) for a new operating lease in the same building as our current corporate headquarters (the “Assumed Lease Premises”). The assumed lease has an original contractual term of 10 years, expiring on November 30, 2031, unless earlier terminated. Pursuant to the Assignment Agreement, the base rent was abated for three full calendar months following the October 1, 2023 effective date of the Assignment Agreement. Thereafter, we are obligated to pay an aggregate of approximately $1.9 million in rent payments for the remaining nine months of the first year, with a 3% rent adjustment (not inclusive of rent abatement) every year thereafter. Upon commencement of the lease in October 2023, we recorded a ROU asset and lease liability of $16.7 million and $16.8 million, respectively.

In January 2021, we entered into a lease agreement for our current corporate headquarters facility located in San Carlos, California and a license agreement for temporary lab and office space in Palo Alto, California. The lease term for our current corporate headquarters facility began on December 3, 2021 and expires on December 31, 2025. We have two 60-month renewal options. We extended the license agreement for our temporary headquarters in the Palo Alto office by 60 days to March 3, 2022 to accommodate our relocation plan. The original term of the license agreement for the temporary space in Palo Alto terminated when the San Carlos office leasehold improvements were completed and we moved into our current corporate headquarters. These two agreements are accounted for as a combined lease because the contracts were negotiated as a package with the same commercial objective. Upon commencement of the San Carlos lease in December 2021, we recorded a ROU asset and lease liability of $28.4 million and $12.9 million, respectively.

In July 2016, we entered into a five-year lease agreement for our previous headquarters facility located in Foster City, California. The original term of the lease was from September 1, 2016 to August 31, 2021, with two 30-month renewal options. In July 2019, we leased another facility in Foster City, California. The original term of this lease was from July 1, 2019 to October 31, 2021, with no renewal options. In November 2020, we extended the terms of these leases for six months to March 1, 2022 and April 30, 2022, respectively. In February 2022, we entered into an early termination agreement for one of the facilities in Foster City and terminated our lease on February 12, 2022 instead of April 30, 2022.

Information related to our ROU assets and related lease liabilities was as follows (dollar amounts in thousands):

	December 31, 2023	December 31, 2022
Cash paid for operating lease liabilities	$ 7,390	$ 5,374
Operating lease right-of-use assets	$ 30,997	$ 21,288
Operating lease liabilities - current	$ 7,113	$ 5,910
Operating lease liabilities - long-term	22,111	12,031
Total lease liabilities	$ 29,224	$ 17,941
Weighted-average remaining lease term (in years)	5.71	2.78
Weighted-average discount rate	8.4%	7.6%

Maturities of lease liabilities as of December 31, 2023 were as follows:

Years ending December 31,	(in thousands)
2024	$ 8,817
2025	9,836
2026	2,899
2027	2,986
2028	3,075
Thereafter	9,503
Total future undiscounted lease payments	37,115
Less: Imputed interest	(7,891)
Total lease liabilities	$ 29,224

Rent expense recognized under the leases was $8.5 million, $7.9 million and $3.2 million for the years ended December 31, 2023, 2022 and 2021, respectively.

7. Commitments and Contingencies

Legal Contingencies

From time to time, we may become involved in legal proceedings arising from the ordinary course of business. We record a liability for such matters when it is probable that future losses will be incurred and that such losses can be reasonably estimated. Significant judgment by us is required to determine both probability and the estimated amount. We do not believe that there is any litigation or asserted or unasserted claim pending that could, individually or in the aggregate, have a material adverse effect on our results of operations or financial condition.

Guarantees and Indemnifications

In the normal course of business, we enter into agreements that contain a variety of representations and provide for general indemnification. Our exposure under these agreements is unknown because it involves claims that may be made against us in the future. To date, we have not paid any claims or been required to defend any action related to our indemnification obligations. As of December 31, 2023 and 2022, we did not have any material

indemnification claims that were probable or reasonably possible and consequently have not recorded related liabilities.

Indemnification

To the extent permitted under Delaware law, we have agreed to indemnify our directors and officers for certain events or occurrences while the director or officer is, or was, serving at our request in such capacity. The indemnification period covers all pertinent events and occurrences during the director's or officer's service. The maximum potential amount of future payments we could be required to make under these indemnification agreements is not specified in the agreements; however, we have directors and officers insurance coverage that reduces our exposure and enables us to recover a portion of any future amounts paid. We have not incurred any material costs as a result of such indemnification and are not currently aware of any indemnification claims.

Development and Manufacturing Services Agreements with Lonza

In April 2022, we entered into a non-exclusive development and manufacturing services agreement with Lonza effective as of March 22, 2022, which was subsequently amended on May 12, 2022, November 21, 2022 and October 31, 2023 (as amended, the "2022 Lonza DMSA"). Pursuant to the 2022 Lonza DMSA, Lonza is obligated to perform services including manufacturing process development and clinical manufacture and supply of our proprietary PCV candidates. Subject to the terms and conditions set forth in the 2022 Lonza DMSA, Lonza has granted to us a non-exclusive, worldwide, fully paid-up, irrevocable, transferable license, including the right to grant sublicenses, under the New General Application Intellectual Property, to research, develop, make, have made, use, sell and import the Product. Unless earlier terminated, the 2022 Lonza DMSA shall remain in place for a period of five years. Either party may terminate the 2022 Lonza DMSA for any reason on prior written notice to the other party, provided that Lonza may not exercise such right until a specified future date. In addition, either party may terminate the 2022 Lonza DMSA (i) within a given time period upon any material breach that is left uncured by the other party, or (ii) immediately if the other party becomes insolvent. We may also terminate the 2022 Lonza DMSA upon an extended force majeure event. Upon expiration and/or termination of the 2022 Lonza DMSA and/or any purchase order, we will pay Lonza for all service rendered, all costs incurred, all unreimbursed capital equipment and any cancellation fees (each term as defined in the 2022 Lonza DMSA).

In February 2023, we entered into another non-exclusive development and manufacturing services agreement with Lonza effective as of March 1, 2023 (the "2023 Lonza DMSA"). Pursuant to the 2023 Lonza DMSA, Lonza will perform manufacturing process development and the manufacture of components for VAX-24 and VAX-31, including the polysaccharide antigens, our proprietary eCRM protein carrier and conjugated drug substances. Subject to the terms and conditions set forth in the 2023 Lonza DMSA, Lonza has granted to us a non-exclusive, worldwide, fully paid-up, transferable license, including the right to grant sublicenses (subject to the prior written consent of Lonza), under the New General Application Intellectual Property, to use, sell and import the Product manufactured under the 2023 Lonza DMSA (but no other products). Unless earlier terminated, the 2023 Lonza DMSA shall remain in place for a period of five years and shall automatically renew for one additional two-year period unless either party provides written notice of non-renewal at least two years prior to the fifth anniversary of the effective date. We may terminate the 2023 Lonza DMSA for any reason on prior written notice to the other party on a Project Plan-by-Project Plan basis. Either party may terminate the 2023 Lonza DMSA (i) within a given time period upon any material breach that is left uncured by the other party, (ii) immediately if the other party becomes insolvent, is dissolved or liquidated, makes a general assignment for the benefit of its creditors, or files or has filed against it, a petition in bankruptcy or has a receiver appointed for a substantial part of its assets, (iii) upon an extended force majeure event, or (iv) if it becomes apparent to either party at any stage in the provision of the Services that it will be impossible to complete the Services for scientific or technical reasons despite exercise of best commercial efforts by both parties. Pursuant to the reason for termination and the party initiating the termination, we will pay Lonza for some combination of services rendered, costs incurred, unreimbursed capital equipment and/or any cancellation fees. Upon an extended force majeure event, neither party shall have any further liability to the other party (each term as defined in the 2023 Lonza DMSA).

Under each of the 2022 Lonza DMSA and 2023 Lonza DMSA (collectively, the "Lonza Agreements") we pay Lonza agreed-upon fees for their performance of development and manufacturing services and pass through expenses incurred by Lonza for raw materials, as well as customary procurement and handling fees. Under each

Lonza Agreement, we own all rights, title and interest in and to any and all New Customer Intellectual Property (as defined in each Lonza Agreement), and Lonza owns all right, title and interest in New General Application Intellectual Property (as defined in each Lonza Agreement).

Commercial Manufacturing and Supply Agreement with Lonza

For details of the Commercial Manufacturing and Supply Agreement with Lonza, see Note 4.

Sutro Option Agreement

In December 2022, we entered into Option Agreement with Sutro Biopharma. Pursuant to the Option Agreement, we acquired from Sutro Biopharma (i) authorization to enter into an agreement with an independent alternate CMO to directly source Sutro Biopharma's cell-free extract, allowing us to have direct oversight over financial and operational aspects of the relationship with the CMO; and (ii) the "Option. We and Sutro Biopharma agreed to negotiate the terms and conditions of a form definitive agreement to be entered into in the event we exercise the Option, which would include the terms and conditions set forth in an executed term sheet between us (the "Term Sheet") and such terms that were necessary to give effect to each of the terms and conditions set forth in the Term Sheet (the "Form Definitive Agreement"). The Option period was five years from the date of the Option Agreement, subject to potential acceleration in the event we undergo a change of control.

As consideration for the Option and other rights and authorizations granted to us under the Option Agreement, we paid Sutro Biopharma upfront consideration of $22.5 million, consisting of (i) $10.0 million in cash and $7.5 million worth of shares of our common stock (the number of shares to be calculated based on the arithmetic average of the daily volume weighted average price of our common stock as traded on Nasdaq in the three consecutive trading days immediately prior to the issuance thereof), and (ii) $5.0 million payable within five business days after we and Sutro Biopharma mutually agree in writing upon the Form Definitive Agreement. The 167,780 shares of common stock issued was recorded at fair value of $8.0 million on the date of settlement, December 22, 2022. In the event that we elected to exercise the Option, we agreed to pay Sutro Biopharma an aggregate Option exercise price of $75.0 million in cash in two installments and, upon the occurrence of certain regulatory milestones, certain additional milestone payments totaling up to $60.0 million in cash.

On September 28, 2023, we and Sutro Biopharma mutually agreed in writing upon the Form Definitive Agreement to become effective in the event that we exercise the Option and, on October 2, 2023, we paid the $5.0 million accrued commitment.

On November 21, 2023 (the "Option Exercise Date"), we exercised the Option by submitting written notice thereof to Sutro Biopharma and concurrently paid Sutro Biopharma $50.0 million in cash as the first of two installment payments for the Option exercise price. Under the Option Agreement, we are obligated to pay Sutro an additional $25.0 million in cash within six months of the Option Exercise Date as the second of two installment payments for the Option exercise. This has been accrued on our consolidated balance sheets as of December 31, 2023. Upon the occurrence of certain regulatory milestones, we would be obligated to pay Sutro Biopharma certain additional milestone payments totaling up to $60.0 million in cash. In the event that we undergo a change of control, certain rights and payments may be accelerated. As of December 31, 2023, we have paid $50 million, the remaining $25 million is accrued as of December 31, 2023. We determined there is no current alternative future use of the acquired manufacturing rights from the Option Agreement. As a result, the amounts paid and accrued for were expensed as incurred.

Manufacturing Rights Agreement with Sutro Biopharma

Concurrent with the payment of the first installment of the Option exercise price pursuant to the Option Agreement, on November 21, 2023, the manufacturing rights agreement (in the form of the Form Definitive Agreement) between us and Sutro Biopharma (the "Manufacturing Rights Agreement") became effective. Under the Manufacturing Rights Agreement, we received an exclusive (except as to Sutro Biopharma), perpetual (subject to

termination), worldwide license, for no additional royalty (i.e., royalty-free, other than any royalties due under the Sutro Biopharma License Agreement), under Sutro Biopharma's relevant patents and know-how, to manufacture or have manufactured extract and improvements to extract (in any form) solely for use in the research, development, use, production, sale, offering for sale, export, import, commercialization or other exploitation of Vaccine Compositions (as defined in the Sutro Biopharma License Agreement) (as well as certain rights with respect to certain regulatory matters related to extract and its use in connection with such Vaccine Compositions). We have the right to extend our rights and obligations under the Manufacturing Rights Agreement to our affiliates and to sublicense our rights to manufacture extract and improvements to extract to certain third-party CMOs and other contractors (for our benefit and not for such third party's independent commercial use). For clarity, we are not permitted to manufacture extract for sale to third parties for the independent use of such third parties.

Under the Manufacturing Rights Agreement, we have the obligation to protect the confidentiality of the extract manufacturing technology, and Sutro Biopharma has certain audit rights in connection therewith. Under the Manufacturing Rights Agreement, upon our request and at our cost, Sutro Biopharma will support up to two technology transfers to us (or to an affiliate of ours or certain third-party CMOs designated by us) of certain Sutro Biopharma know-how, materials and information to enable us to manufacture or have manufactured extract. Under certain circumstances, Sutro Biopharma may source extract from us or certain third-party CMOs, subject to reimbursement for technology transfer costs.

The Manufacturing Rights Agreements contains certain terms with respect to the ownership, prosecution, maintenance and enforcement of certain intellectual property rights licensed or arising under the Manufacturing Rights Agreement, which are generally consistent with the Sutro Biopharma License Agreement.

Unless earlier terminated, the Manufacturing Rights Agreement will remain in effect in perpetuity. Sutro Biopharma may only terminate the Manufacturing Rights Agreement in the event of our (i) uncured, intentional, material breach of certain confidentiality provisions resulting in actual, material harm to Sutro Biopharma's business, (ii) uncured, intentional material breach of certain provisions relating to the use of certain of Sutro Biopharma's know-how outside of the Vaccine Field, (iii) unintentional, material breach of certain provisions relating to the use of certain of Sutro Biopharma's know-how outside of the Vaccine Field that we do not use reasonable best efforts to cease and (to the extent reasonably curable) cure in a timely fashion, or (iv) uncured failure to pay the Option exercise price or any undisputed milestone payment under the Option Agreement when due. We may terminate the Manufacturing Rights Agreement at our discretion upon 60 days' written notice, and both parties may terminate the Manufacturing Rights Agreement upon mutual written consent.

Purchase Commitments

We enter into agreements in the normal course of business with CMOs and other vendors for manufacturing services and raw materials purchases. We rely on several third-party manufacturers for our manufacturing requirements. As of December 31, 2023, we had the following amounts of non-cancelable purchase commitments related to manufacturing services and raw materials purchased due to our key manufacturing partners. These amounts represent our minimum contractual obligations, including termination fees. If we terminate certain firm orders with key manufacturing partners, we will be required to pay for the manufacturing services scheduled or raw materials purchased under our arrangements. The actual amounts we pay in the future to our vendors under such agreements may differ from the purchase order amounts.

Years ending December 31,	**(in thousands)**
2024	$ 181,812
2025	41,840
2026	1,296
2027	414
Total non-cancelable purchase commitments due to key manufacturing partners	$ 225,362

8. Stockholders' Equity

Preferred Stock

Our certificate of incorporation authorizes us to issue up to 10,000,000 shares of preferred stock with $0.001 par value per share. There were no shares preferred stock issued or outstanding as of December 31, 2023 and 2022. Our board of directors ("Board") are authorized to provide for the issue of all or any of the shares of preferred stock in one or more series, and to fix, determine or alter the voting powers, designation, preferences and rights of the preferred shares, and the qualifications, limitations or restrictions of any wholly unissued shares, to establish from time to time the number of shares constituting any such series, and to increase or decrease the number of shares, if any. Holders of outstanding shares of preferred stock shall be entitled to receive dividends, when, and as declared by the Board in preference and priority to any declaration or payment of any distribution on common stock. The right to receive dividends on preferred shares of preferred stock shall not be cumulative and no right to dividends shall accrue to holders of preferred stock. No dividends have been paid or declared as of December 31, 2023 and 2022.

Common Stock

Our certificate of incorporation authorizes us to issue up to 500,000,000 shares of common stock with $0.001 par value per share, of which 95,364,831 and 79,470,670 shares were issued and outstanding as of December 31, 2023 and 2022, respectively. The holders of our common stock are also entitled to receive dividends whenever funds are legally available, when and if declared by our Board. As of December 31, 2023 and 2022, no dividends have been declared. Each share of common stock is entitled to one vote.

In July 2021, we entered into an Open Market Sales Agreement℠ (the "Original ATM Sales Agreement") with Jefferies LLC ("Jefferies") which provided that, upon the terms and subject to the conditions and limitations set forth in the Original ATM Sales Agreement, we may elect to issue and sell, from time to time, shares of our common stock having an aggregate offering price of up to $150.0 million through Jefferies acting as our sales agent or principal. As of February 27, 2023, we had sold 4,995,709 shares of our common stock under the Original ATM Sales Agreement at an average price of $27.57 per share for aggregate gross proceeds of $137.8 million. On February 27, 2023, we and Jefferies entered into an amendment to the Original ATM Sales Agreement (as amended, the "Amended ATM Sales Agreement") pursuant to which we may offer and sell shares of our common stock having an aggregate offering price of up to $400.0 million, which is in addition to the $150.0 million aggregate offering price under the Original ATM Sales Agreement. The material terms and conditions of the Original ATM Sales Agreement otherwise remain unchanged. We will pay Jefferies a commission of up to 3.0% of the gross sales proceeds of any common stock sold through Jefferies under the Amended ATM Sales Agreement; however, we are not obligated to make any sales of common stock. As of December 31, 2023, we have sold 1,588,807 shares of our common stock under the Amended ATM Sales Agreement at an average price of $44.06 per share for aggregate gross proceeds of $70.0 million ($68.6 million net of commissions and offering expenses).

On January 13, 2022, we completed an underwritten public offering in which we issued 2,500,000 shares of our common stock at a price of $20.00 per share and pre-funded warrants to purchase 2,500,000 shares of our common stock at a price of $19.999 per underlying share. In February 2022, the underwriters exercised their option to purchase an additional 750,000 shares of common stock. In aggregate, we received $107.6 million in net proceeds after deducting underwriting discounts and commissions and other offering expenses payable by us, and excluding the exercise of any pre-funded warrants.

On October 28, 2022, we completed an underwritten public offering of 17,812,500 shares of our common stock, which included the full exercise of the underwriters' option to purchase an additional 2,812,500 shares, at a price of $32.00 per share and pre-funded warrants to purchase 3,750,000 shares of our common stock at a price of $31.999 per underlying share. In aggregate, we received $651.6 million in net proceeds after deducting underwriting discounts and commissions and other offering expenses payable by us, and excluding the exercise of any pre-funded warrants.

On April 21, 2023, we completed an underwritten public offering of 13,030,000 shares of our common stock, which included the full exercise of the underwriters' option to purchase an additional 1,830,000 shares, at a price of $41.00 per share and pre-funded warrants to purchase 1,000,000 shares of our common stock at a price of $40.999 per underlying share. In aggregate, we received $545.3 million in net proceeds after deducting underwriting discounts and commissions and other offering expenses payable by us, and excluding the exercise of any pre-funded warrants.

Common stock reserved for future issuances under the 2020 Equity Incentive Plan (the "2020 Plan") and the 2014 Equity Incentive Plan (the "2014 Plan") was as follows, and excludes 36,710 shares issued outside of the 2014 Plan and 2020 Plan:

	December 31, 2023	December 31, 2022
Options issued and outstanding	9,314,836	7,715,494
Restricted stock units issued and outstanding	753,462	456,766
Shares available for future stock option grants	6,065,150	4,679,598
Total	16,133,448	12,851,858

9. Pre-Funded Warrants

In connection with our underwritten public offering in January 2022, we issued pre-funded warrants to purchase 2,500,000 shares of our common stock at a price of $19.999 per underlying share. Each pre-funded warrant has an exercise price of $0.001 per share.

In connection with our underwritten public offering in October 2022, we issued pre-funded warrants to purchase 3,750,000 shares of our common stock at a price of $31.999 per underlying share. Each pre-funded warrant has an exercise price of $0.001 per share.

In connection with our underwritten public offering in April 2023, we issued pre-funded warrants to purchase 1,000,000 shares of our common stock at a price of $40.999 per underlying share. Each pre-funded warrant has an exercise price of $0.001 per share. The public offering prices for the pre-funded warrants were equal to the public offering prices of our common stock, less the $0.001 exercise price of each pre-funded warrant and were recorded as a component of stockholders' equity within additional paid-in-capital.

The pre-funded warrants are exercisable, at the option of each holder, in whole or in part by delivering to us a duly executed exercise notice and payment of the exercise price. No fractional shares of common stock will be issued in connection with the exercise of a pre-funded warrant. The holders of the pre-funded warrants may also satisfy their obligation to pay the exercise price through a "cashless exercise," in which the holder receives the net value of the pre-funded warrant in shares of common stock determined according to the formula set forth in the pre-funded warrant.

The pre-funded warrants will not expire until they are fully exercised. However, we may not effect the exercise of any pre-funded warrants, and a holder will not be entitled to exercise any portion of any pre-funded warrants that, upon giving effect to such exercise, would cause: (i) the aggregate number of shares of our common stock beneficially owned by such holder (together with affiliates) to exceed 4.99% or 9.99% of the number of shares of our common stock outstanding immediately after giving effect to the exercise, as applicable; or (ii) the combined voting power of our securities beneficially owned by such holder (together with its affiliates) to exceed 4.99% or 9.99% of the combined voting power of all of our securities outstanding immediately after giving effect to the exercise, as applicable, as such percentage ownership is determined in accordance with the terms of the pre-funded warrants. However, any holder of a pre-funded warrant may increase or decrease such percentage to any other percentage not in excess of 19.99% upon at least 61 days' prior notice for the holder to us. As of December 31, 2023, no shares underlying the pre-funded warrants had been exercised.

10. Equity Incentive Plans

2020 and 2014 Equity Incentive Plans

In June 2020, our Board adopted, and our stockholders approved, the 2020 Plan, which became effective on June 11, 2020. Under the 2020 Plan, we may grant stock options, appreciation rights, restricted stock and restricted stock units (RSUs) to employees, consultants and directors. Stock options granted under the 2020 Plan may be either incentive stock options or nonqualified stock options. Incentive stock options may be granted only to our employees, including officers and directors who are also employees. Nonqualified stock options may be granted to our employees, officers, directors, consultants and advisors. The exercise price of stock options granted under the 2020 Plan must be at least equal to the fair market value of the common stock on the date of grant, except that an incentive stock option granted to an employee who owns more than 10% of the shares of our common stock shall have an exercise price of no less than 110% of the fair value per share on the grant date and expire five years from the date of grant. The maximum term of stock options granted under the 2020 Plan is 10 years, unless subject to the provisions regarding 10% stockholders. Our stock options granted to new employees generally vest over four years at a rate of 25% upon the first anniversary of the vesting commencement date and monthly thereafter. Our other stock options granted to employees generally vest on terms consistent with stock options granted to new employees or monthly over four years from the vesting commencement date. Our RSUs granted to new employees generally vest over four years at a rate of 25% upon one year from the grant date, then 12.5% every six months thereafter. Our other RSUs granted to employees generally vest over three and a half years at a rate of 25% upon six months from the grant date, then 12.5% every six months thereafter. A total of 10,150,000 shares of common stock were approved to be initially reserved for issuance under the 2020 Plan. The number of shares that remained available for issuance under the 2014 Plan as of the effective date of the 2020 Plan, and shares subject to outstanding awards under the 2014 Plan as of the effective date of the 2020 Plan that are subsequently canceled, forfeited or repurchased by us, will be added to the shares reserved under the 2020 Plan. In addition, the number of shares of common stock available for issuance under the 2020 Plan is automatically increased on the first day of each calendar year during the 10-year term of the 2020 Plan, beginning with January 1, 2021 and ending with January 1, 2030, by an amount equal to 5% of the outstanding number of shares of our common stock on December 31 of the preceding calendar year or such lesser amount as determined by our Board. As of December 31, 2023, an aggregate of 6,065,150 shares of common stock were available for issuance under the 2020 Plan. Effective January 1, 2024, the number of shares of common stock available under the 2020 Plan increased by 4,768,241 shares pursuant to the evergreen provision of the 2020 Plan.

Our 2014 Plan permitted the granting of incentive stock options, non-statutory stock options, restricted stock and other stock-based awards. Subsequent to the adoption of the 2020 Plan, no additional equity awards can be made under the 2014 Plan. Shares reserved and remaining available for issuance under the 2014 Plan were added to the 2020 Plan reserve upon its effectiveness.

The terms of the 2014 Plan permit the exercise of options granted prior to vesting, subject to required approvals. The unvested shares are subject to our lapsing repurchase right upon termination of employment at the original purchase price. Shares purchased by employees pursuant to the early exercise of stock options are not deemed, for accounting purposes, to be issued until those shares vest according to their respective vesting schedules. Cash received for early exercised stock options is recorded as other liabilities on the consolidated balance sheets and is reclassified to common stock and additional paid-in capital as such shares vest.

As of December 31, 2023, 2,227,963 shares and 7,840,335 shares of common stock were subject to outstanding options and RSUs under the 2014 Plan and 2020 Plan, respectively.

At December 31, 2023 and 2022, 0 and 3,705 shares, respectively, remained subject to our right of repurchase as a result of the early exercised stock options. The remaining liabilities related to early exercised shares as of December 31, 2023 and 2022 were both less than $0.1 million and were recorded in other liabilities.

Stock Option Activity

Stock option activity under our 2020 Plan and 2014 Plan, which excludes options to purchase 36,710 shares granted outside of the 2020 Plan and 2014 Plan, was as follows:

		Options Outstanding			
Stock Option and Restricted Stock Units Activity	Options and RSUs Available for Grant	Number of Options	Weighted-Average Exercise Price Per Share	Weighted-Average Remaining Contractual Term (Years)	Aggregate Intrinsic Value
Balances — December 31, 2021	6,104,756	5,295,007	$ 9.30		
Additional shares authorized	2,651,598	—			
Options granted	(3,850,981)	3,850,981	$ 27.67		
Options exercised	385 (1)	(1,153,285)	$ 4.25		
Options forfeited	277,209	(277,209)	$ 23.54		
Restricted Stock Units granted	(581,047)				
Restricted Stock Units withheld	32,626				
Restricted Stock Units forfeited	45,052				
Balances — December 31, 2022	4,679,598	7,715,494	$ 18.70	8.20	$ 225,667
Additional shares authorized	3,973,533				
Options granted	(2,343,037)	2,343,037	$ 44.44		
Options exercised	1,080 (1)	(538,888)	$ 10.50		
Options forfeited	204,807	(204,807)	$ 32.58		
Restricted Stock Units granted	(574,123)				
Restricted Stock Units withheld	78,755				
Restricted Stock Units forfeited	44,537				
Balances — December 31, 2023	6,065,150	9,314,836	$ 25.35	7.75	$ 348,868
Vested and expected to vest — December 31, 2023		9,314,836	$ 25.35	7.75	$ 348,868
Exercisable at December 31, 2023		4,646,989	$ 16.40	6.80	$ 215,608

(1) Shares returned due to net exercises.

During the years ended December 31, 2023, 2022 and 2021, options to purchase 538,888, 1,153,285 and 926,514 shares of common stock, respectively, were exercised for cash at a weighted-average price per share of $10.50, $4.25 and $3.25, respectively. The weighted-average grant date fair value of options granted for the years ended December 31, 2023, 2022 and 2021 was $28.74, $18.88 and $14.65, respectively. The intrinsic value of the stock options exercised was $21.2 million, $34.0 million and $18.9 million for the years ended December 31, 2023, 2022 and 2021, respectively.

Restricted Stock Units Activity

In March 2022, our Board authorized the issuance of RSUs under our 2020 Plan and adopted a form of Restricted Stock Unit Grant Notice and Restricted Stock Unit Award Agreement (the "RSU Agreement"), which is intended to serve as a standard form agreement for RSU grants issued to employees. RSU activity for the years ended December 31, 2023 and 2022 was as follows:

	Shares	Weighted-Average Grant-Date Fair Value
Unvested at December 31, 2021	—	$ —
Granted	581,047	26.25
Vested and released	(79,229)	24.79
Cancelled	(45,052)	24.32
Unvested at December 31, 2022	456,766	$ 26.70
Granted	574,123	45.57
Vested and released	(232,890)	30.97
Cancelled	(44,537)	40.78
Unvested at December 31, 2023	753,462	$ 38.93

The weighted-average grant date fair value of RSUs granted during the year ended December 31, 2023 and December 31, 2022 was $45.57 and $26.25, respectively. The aggregate fair value of unvested RSUs is calculated using the closing price of our common stock on the grant date. As of December 31, 2023 and December 31, 2022, the unrecognized stock-based compensation cost of unvested RSUs was $25.9 million and $10.8 million, respectively, which is expected to be recognized over a weighted-average period of 2.7 years and 3.0 years, respectively.

2020 Employee Stock Purchase Plan

In June 2020, our Board adopted, and our stockholders approved, the 2020 Employee Stock Purchase Plan (the "2020 ESPP"), which became effective on June 11, 2020. The 2020 ESPP permits participants to purchase common stock through payroll deductions of up to 15% of their eligible compensation. Employees enrolled in the 2020 ESPP purchase shares of common stock at a price per share equal to 85% of the lower of the fair market value at the start or end of the six-month purchase periods within the two-year offering period. A total of 650,000 shares of common stock were approved to be initially reserved for issuance under the 2020 ESPP. In addition, the number of shares of common stock available for issuance under the 2020 ESPP is automatically increased on the first day of each calendar year during the 10-year term of the 2020 Plan, beginning with January 1, 2021 and ending with January 1, 2030, by an amount of 1% of the outstanding number of shares of our common stock on December 31 of the preceding calendar year or such lesser amount as determined by our Board. Activity under our 2020 ESPP was as follows:

	Shares
Balance - December 31, 2021	1,070,704
Additional shares authorized	530,319
Shares purchased	(61,709)
Balance - December 31, 2022	1,539,314
Additional shares authorized	794,706
Shares purchased	(76,275)
Balance - December 31, 2023	2,257,745

Effective January 1, 2023, the number of shares of common stock available under the 2020 ESPP increased by 794,706 shares pursuant to the evergreen provision of the 2020 ESPP. There was no increase effective January 1, 2024 as determined by our Board.

Stock-based Compensation

We estimated the fair value of employee stock options using the Black-Scholes option-pricing model for the years ended December 31, 2023, 2022 and 2021 using the following weighted-average assumptions:

	Year Ended December 31,		
	2023	**2022**	**2021**
Fair Value Assumptions			
Expected volatility	71.3% - 74.0%	78.1% - 85.1%	81.0% - 84.1%
Expected dividend yield	0%	0%	0%
Expected term (in years)	5.3 - 5.4	5.3 - 5.5	5.3 - 5.5
Risk-free interest rate	3.5% - 4.6%	1.6% - 4.4%	0.5% - 1.3%

We estimated the fair value of shares under the 2020 ESPP using the Black-Scholes option-pricing model for the years ended December 31, 2023, 2022 and 2021 using the following weighted-average assumptions:

	Year Ended December 31,		
	2023	**2022**	**2021**
Fair Value Assumptions			
Expected volatility	38.1% - 99.7%	78.8% - 99.7%	79.6% - 126.3%
Expected dividend yield	0%	0%	0%
Expected term (in years)	0.5 - 2.0	0.5 - 2.0	0.5 - 2.0
Risk-free interest rate	4.2% - 5.4%	0.1% - 4.7%	0.0% - 0.5%

We recorded total stock-based compensation expense for the years ended December 31, 2023, 2022 and 2021 related to the 2014 Plan, the 2020 Plan and the 2020 ESPP in the consolidated statements of operations and allocated the amounts as follows:

	Year Ended December 31,		
	2023	**2022**	**2021**
		(In thousands)	
Research and development	$ 23,275	$ 9,899	$ 3,954
General and administrative	25,485	13,751	6,775
Total	$ 48,760	$ 23,650	$ 10,729

As of December 31, 2023, there was $127.5 million of unrecognized stock-based compensation expense related to employee and non-employee awards, which is expected to be recognized over a weighted-average period of 2.7 years.

11. Retirement Plan

We sponsor a qualified 401(k) Plan (the “401(k) Plan”). The 401(k) Plan is a defined contribution plan covering eligible employees. Participants may contribute a portion of their annual compensation limited to a maximum annual amount set by the Internal Revenue Code. The 401(k) Plan is a safe-harbor plan whereby we make mandatory employer-matching contributions to plan participants’ accounts through payroll. For the years ended December 31, 2023, 2022 and 2021, we contributed $1.4 million, $0.8 million and $0, respectively, to the 401(k) Plan.

12. Funding Arrangement

Our VAX-A1 vaccine development program currently is funded in part by a grant obtained from Combating Antibiotic Resistant Bacteria Biopharmaceutical Accelerator ("CARB-X"), a global non-profit partnership dedicated to accelerating antibacterial innovation to tackle the rising global threat of drug-resistant bacteria. The CARB-X grant provides for total potential funding of up to $14.6 million (including $11.7 million awarded to date since the grant's inception in 2019) upon the achievement of VAX-A1 development milestones through June 2024.

Our VAX-GI vaccine development program is currently funded in part by two grants obtained from the National Institutes of Health ("NIH") administered by the University of Maryland, Baltimore. Our first grant from the NIH was awarded in April 2021 and provides for potential funding up to five years totaling approximately $0.5 million. In June 2023, we received another grant from the NIH that provides for potential funding up to five years totaling approximately $4.6 million.

Income from grants is recognized in the period during which the related specified expenses are incurred, provided that the conditions under which the grants were provided have been met. We recognized $4.8 million, $1.9 million and $1.6 million of grant income and recorded the amounts in Other income (expense), net in the consolidated statements of operations during the years ended December 31, 2023, 2022, and 2021, respectively. A grant receivable of $0 and $1.0 million representing unreimbursed, eligible costs incurred under the CARB-X agreement was recorded and included in Prepaid expenses and other current assets in the consolidated balance sheets as of December 31, 2023 and 2022, respectively.

13. Net Loss Per Share

The following table sets forth the computation of basic and diluted net loss per share and excludes shares which are legally outstanding, but subject to repurchase by us:

	Year Ended December 31,		
	2023	**2022**	**2021**
Net loss (in thousands)	$ (402,266)	$ (223,485)	$ (100,077)
Weighted-average shares outstanding used in computing net loss per share, basic and diluted[(1)]	97,157,690	64,877,988	51,922,108
Net loss per share, basic and diluted	$ (4.14)	$ (3.44)	$ (1.93)

(1) Includes shares of common stock into which pre-funded warrants may be exercised. See Note 9, "Pre-Funded Warrants."

The following potentially dilutive securities were excluded from the computation of diluted net loss per share for the period presented because including them would have been antidilutive:

	Year Ended December 31,		
	2023	**2022**	**2021**
Stock options	9,351,546	7,752,204	5,357,389
Restricted stock units	753,462	456,766	-
Employee stock purchase plan	103,628	113,240	66,404
Total	10,208,636	8,322,210	5,423,793

14. Income Taxes

Our pre-tax book loss was derived from our business operations within the United States.

A reconciliation of our effective tax rate to the statutory U.S. federal rate is as follows:

	Year Ended December 31,		
	2023	2022	2021
Statutory rate	21.0%	21.0%	21.0%
Stock-based compensation	0.5%	1.5%	2.2%
Credits	1.4%	0.8%	1.1%
Change in valuation allowance	(21.8)%	(21.3)%	(23.0)%
Section 162(m) limitation	(1.1)%	(1.8)%	(1.1)%
Other	0.0%	(0.2)%	(0.2)%
Total	0.0%	0.0%	0.0%

Deferred income taxes reflect the net tax effects of temporary differences between the carrying amounts of the assets and liabilities for financial reporting purposes and the amounts used for income tax purposes. The following table presents significant components of our deferred tax assets as of December 31, 2023 and 2022:

	As of December 31,	
	2023	2022
	(in thousands)	
Deferred tax assets:		
Net operating losses	135,298	111,555
Fixed assets	660	1,062
Accrued and others	11,279	1,103
R&D Credits	12,870	5,436
Capitalized R&D expenditures	79,485	32,873
Accrued manufacturing expenses	10,819	2,063
Lease liability	8,739	5,358
Intangible assets	29,302	6,867
Stock compensation	8,981	4,474
Total deferred tax assets	297,434	170,791
Deferred tax liabilities:		
ROU asset	(9,269)	(6,357)
Total deferred tax liabilities	(9,269)	(6,357)
Net deferred tax asset	288,165	164,433
Valuation allowance	(288,165)	(164,433)
Net deferred taxes	$ —	$ —

At December 31, 2023, we have net operating loss ("NOL") carryforwards of approximately $351.9 million and $693.6 million available to reduce future taxable income, if any, for federal and state income tax purposes, respectively. The federal and state NOL carryforwards, except the federal loss carryforward arising in tax years beginning after December 31, 2017, begin to expire in 2034 unless previously utilized. Federal NOLs arising in tax years beginning after December 31, 2017 have an indefinite carryover period and do not expire.

At December 31, 2023, we have research credit carryforwards of $12.8 million and $4.6 million available to offset future income tax liabilities, if any, for federal and California income tax purposes, respectively. The federal research and development tax credit carryforwards expire beginning in 2039 unless previously utilized. The California tax credits can be carried forward indefinitely.

We have evaluated the positive and negative evidence bearing upon the realizability of our deferred tax assets. Based on our history of operating losses, we have concluded that it is more likely than not that the benefit of our deferred tax assets will not be realized. Accordingly, we have provided a full valuation allowance for deferred tax assets as of December 31, 2023 and 2022.

Utilization of the NOL and research credit carryforward may be subject to an annual limitation due to the ownership percentage change limitations under Section 382 and Section 383, respectively, provided by the Internal Revenue Code of 1986, as amended (the "Code"), and similar state provisions. The annual limitation may result in the expiration of the NOL before utilization. We have experienced ownership changes in the past. There were no ownership changes identified in 2023, as such we have determined that no federal research credits will expire unutilized or are excluded from our research credit carryforwards. Subsequent ownership changes may affect the limitation in future years.

We have uncertain tax benefits ("UTBs") totaling $4.4 million and $1.8 million as of December 31, 2023 and 2022, respectively, which were netted against deferred tax assets subject to valuation allowance. The UTBs had no effect on the effective tax rate. We recognize interest and penalties related to UTBs, when they occur, as a component of income tax expense. To the extent accrued interest and penalties do not ultimately become payable, amounts accrued will be reduced and reflected as a reduction of the provision for income taxes in the period such determination is made. There were no interest or penalties recognized for the years ended December 31, 2023 and 2022. We do not expect our UTBs to change significantly over the next 12 months.

A reconciliation of the beginning and ending unrecognized tax benefit amount is as follows:

	December 31,		
	2023	2022	2021
		(in thousands)	
Balance at the beginning of the year	$ 1,754	$ 924	$ 393
Additions based on tax positions related to current year	2,208	876	461
Additions based on tax positions related to prior years	485	(46)	70
Balance at end of year	$ 4,447	$ 1,754	$ 924

We file U.S. federal and state tax returns. In general, the Company is no longer subject to tax examination by the Internal Revenue Service or state taxing authorities for years before 2019. Although the federal and state statutes are closed for purposes of assessing additional income tax in those prior years, the taxing authorities may still make adjustments to the NOL and credit carryforwards used in open years. Therefore, the tax statutes should be considered open as it relates to the NOL and credit carryforwards used in open years. We do not have any tax audits or other issues pending.

In accordance with the 2017 Tax Act, research and experimental ("R&E") expenses under Internal Revenue Code Section 174 are required to be capitalized beginning in 2022. R&E expenses are required to be amortized over a period of five years for domestic expenses and 15 years for foreign expenses. The Company has capitalized research and experimental expenditures in its current tax provision as a result.

The Inflation Reduction Act of 2022 specifically introduces the topic of corporate alternative minimum tax on adjusted financial statement income on applicable corporations for taxable years beginning after December 31, 2022. There is no impact to the Company's current tax provision.

The American Rescue Plan Act was signed on March 11, 2021. One of the provisions of the Act included expanding the definition of covered employees subject to IRC 162(m) to include an additional top five highest compensated officers beyond the CEO, CFO, and three highest paid employees currently covered under IRC 162(m). This expanded provision is applicable for tax years beginning after December 31, 2026. We do not believe that this update to IRC 162(m) would have a material impact on its income tax provision currently and will continue to monitor this.

15. Related Party Transactions

We have an ongoing relationship with Sutro Biopharma. In 2013, Sutro Biopharma provided support to facilitate the establishment of our Company. As of December 31, 2021 and 2020, Sutro Biopharma owned approximately 1.6 million shares of our common stock. As of December 31, 2019, Sutro Biopharma also owned warrants to purchase 31,857 shares of our common stock (the "Common Stock Warrant") at an exercise price of $0.79289 per share and 59,276 shares of our Series C redeemable convertible stock (the "Preferred Stock Warrant") at an exercise price of $11.5215 per share. The Common Stock Warrant and the Preferred Stock Warrant were automatically net exercised pursuant to their terms for 30,278 shares and 16,591 shares, respectively, of our common stock in connection with our initial public offering in June 2020. In the agreements and amendments identified herein, we licensed certain intellectual property and acquired certain supply rights from Sutro Biopharma, including the right to use the XpressCF platform to discover and develop vaccine candidates for the treatment or prophylaxis of infectious diseases. On October 12, 2015, we and Sutro Biopharma (the "Parties") entered into the Sutro Biopharma License Agreement, which amended and restated an agreement dated August 1, 2014. The Sutro Biopharma License Agreement was subsequently amended on May 9, 2018 ("License Amendment A1") and May 29, 2018 ("License Amendment A2"). In consideration for the License Amendment A2, we issued to Sutro Biopharma the Preferred Stock Warrant to purchase 59,276 shares of Series C redeemable convertible preferred stock at a purchase price of $11.5215 per share. We also entered into a separate supply agreement with Sutro Biopharma on May 29, 2018 (the "Sutro Biopharma Supply Agreement"). As of June 2, 2021, Sutro Biopharma was no longer considered a related party.

Under the Sutro Biopharma License Agreement, Sutro Biopharma granted us an exclusive, worldwide license to research, develop, manufacture and commercialize vaccine products addressing infectious disease, which are discovered or produced based on the use of Sutro Biopharma's proprietary cell-free protein expression technology, known as XpressCF, which utilizes extracts derived from strains of *E. coli*. In connection with the Sutro Biopharma License Agreement, under the Sutro Biopharma Supply Agreement, Sutro Biopharma has agreed to manufacture and supply extracts and reagents for us on a cost-plus basis. In consideration for the rights licensed, we are obligated to pay a 4% royalty on worldwide aggregate annual net sales of our vaccine products for human health and a 2% royalty on annual net sales of vaccine products for animal health. In License Amendment A1, the Parties amended the license agreement to remove a pre-IND regulatory meeting as a diligence milestone and to agree that certain other diligence milestones had been satisfied. In License Amendment A2, the Parties amended the license agreement to add certain terms confirming our obligation to purchase Sutro Biopharma's proprietary extract from *E. coli* ("Extract") from Sutro Biopharma. In addition, the Parties amended the license agreement to specify our rights to a transfer of certain know-how relating to the manufacture of Extract in the event of a declaration of bankruptcy by Sutro Biopharma. Finally, the Parties agreed to terms providing for injunctive relief in the event of a breach or threatened breach by the other party.

In the Sutro Biopharma Supply Agreement, the Parties agreed to terms for the supply of manufactured Extract and custom reagents by Sutro Biopharma for us to use in manufacturing vaccine compositions in non-clinical research or in Phase 1 or Phase 2 clinical trials. The term of the Sutro Biopharma Supply Agreement is from execution until the later of July 31, 2021 and the date the parties enter into and commence activities under the supply agreement unless extended through a subsequent supply agreement for the supply of Extract and custom reagents for vaccine compositions for Phase 3 and commercial uses as contemplated in the Supply Agreement. In February 2021, we entered into an amendment to the Sutro Biopharma Supply Agreement and extended the term to July 31, 2022.

As Sutro Biopharma was no longer considered a related party as of June 2, 2021, we excluded expenses after that date from related party transaction expenses. We recognized expense related to the Supply Agreement of $0 million, $0 million and $2.4 million for the years ended December 31, 2023, 2022 and 2021, respectively.

16. Subsequent Events

On February 2, 2024, we completed an underwritten public offering of 12,695,312 shares of our common stock, which included the full exercise of the underwriters' option to purchase an additional 1,757,812 shares, at a price of $64.00 per share and pre-funded warrants to purchase 781,250 shares of our common stock at a price of $63.999 per underlying share. In aggregate, we received $816.5 million in net proceeds after deducting underwriting discounts and commissions and other estimated offering expenses payable by us, and excluding the exercise of any pre-funded warrants.

Item 9. Changes in and Disagreements with Accountants on Accounting and Financial Disclosure.

None.

Item 9A. Controls and Procedures.

Conclusion Regarding the Effectiveness of Disclosure Controls and Procedures

We maintain disclosure controls and procedures that are designed to ensure that information required to be disclosed in our periodic and current reports that we file with the SEC is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms, and that such information is accumulated and communicated to our management, including our principal executive officer and principal financial officer, as appropriate, to allow timely decisions regarding required disclosure. In designing and evaluating the disclosure controls and procedures, management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable and not absolute assurance of achieving the desired control objectives. In reaching a reasonable level of assurance, management necessarily is required to apply its judgment in evaluating the cost-benefit relationship of possible controls and procedures. In addition, the design of any system of controls also is based in part upon certain assumptions about the likelihood of future events, and there can be no assurance that any design will succeed in achieving its stated goals under all potential future conditions; over time, control may become inadequate because of changes in conditions, or the degree of compliance with policies or procedures may deteriorate. Because of the inherent limitations in a cost-effective control system, misstatements due to error or fraud may occur and not be detected.

Our management, with the participation of our Chief Executive Office ("CEO") and our Chief Financial Officer ("CFO"), our principal executive officer and principal financial officer, respectively, have evaluated the effectiveness of the design and operation of our disclosure controls and procedures, as defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934 (as amended, the "Exchange Act") as of December 31, 2023. Based on this evaluation, our CEO and CFO have concluded that our disclosure controls and procedures as of December 31, 2023 were effective at the reasonable assurance level.

Changes in Internal Control Over Financial Reporting

There have been no changes in our internal control over financial reporting during the quarter ended December 31, 2023 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Management's Annual Report on Internal Control over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting as defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act. Our internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of the consolidated financial statements for external purposes in accordance with GAAP. Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Our management assessed the effectiveness of our internal control over financial reporting as of December 31, 2023 based on the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission in its 2013 Internal Control - Integrated Framework. Based on this assessment, our management has concluded that our internal control over financial reporting was effective as of December 31, 2023. Pursuant to Section 404(c) of the Sarbanes-Oxley Act, our independent registered public accounting firm has issued an attestation report on the effectiveness of our internal control over financial reporting for the year ended December 31, 2023, which is included below.

Report of Independent Registered Public Accounting Firm

To the stockholders and the Board of Directors of Vaxcyte, Inc.

Opinion on Internal Control over Financial Reporting

We have audited the internal control over financial reporting of Vaxcyte, Inc. and subsidiary (the "Company") as of December 31, 2023, based on criteria established in Internal Control — Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). In our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2023, based on criteria established in Internal Control — Integrated Framework (2013) issued by COSO.

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated balance sheets and related consolidated statements of operations, comprehensive loss, stockholders' equity, and cash flows as of and for the year ended December 31, 2023, of the Company and our report dated February 27, 2024, expressed an unqualified opinion on those financial statements.

Basis for Opinion

The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management's Annual Report on Internal Control over Financial Reporting. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements. Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/ Deloitte & Touche LLP

San Francisco, California
February 27, 2024

Item 9B. Other Information.

Trading Arrangements

The adoption or termination of contracts, instructions or written plans for the purchase or sale of our securities by our Section 16 officers or directors for the three months ended December 31, 2023, of which was entered into during an open trading window and is intended to satisfy the affirmative defense conditions of Rule 10b5-1(c) under the Exchange Act ("10b5-1 Plan"), were as follows:

Elvia Cowan, our Senior Vice President of Finance and Principal Accounting Officer, adopted a 10b5-1 Plan on November 13, 2023. Ms. Cowan's 10b5-1 Plan provides for the potential exercise and sale of up to 26,678 shares of our common stock, and expires on February 28, 2025, or upon the earlier completion of all authorized transactions thereunder.

Item 9C. Disclosure Regarding Foreign Jurisdictions that Prevent Inspections.

Not applicable.

PART III

Certain information required by Part III is omitted from this Annual Report on Form 10-K since we intend to file our definitive proxy statement for our 2024 Annual Meeting of Stockholders (the "2024 Proxy Statement") pursuant to Regulation 14A of the Exchange Act, not later than 120 days after the end of the fiscal year covered by this Annual Report on Form 10-K, and certain information to be included in the 2024 Proxy Statement is incorporated herein by reference.

Item 10. Directors, Executive Officers and Corporate Governance.

The information required by this item of Form 10-K will be included under the captions "Proposal No. 1— Election of Directors," "Executive Officers," "Delinquent Section 16(a) Reports," "Corporate Governance and Board Matters," and "Code of Business Conduct and Ethics" in our 2024 Proxy Statement, and is incorporated herein by reference.

We have adopted a written Code of Business Conduct and Ethics ("Ethics Code") that applies to all officers, directors and employees, including our principal executive officer, principal financial officer, principal accounting officer or controller, or persons performing similar functions. The Ethics Code is available on our website at www.vaxcyte.com. If we make any substantive amendments to the Ethics Code or grant any waiver from a provision of the Ethics Code to any executive officer or director, we will promptly disclose the nature of the amendment or waiver on our website or in a Current Report on Form 8-K.

Item 11. Executive Compensation.

The information required by this item of Form 10-K will be included under the captions "Executive Officers," "Executive Compensation," "Director Compensation," "Corporate Governance and Board Matters," and "Certain Relationships and Related Person Transactions" in our 2024 Proxy Statement, and is incorporated herein by reference.

All information provided under the "Pay Versus Performance Disclosure" heading of the 2024 Proxy Statement will not be deemed to be incorporated by reference into any filing of ours under the Securities Act of 1933, as amended, or the Securities Exchange Act of 1934, as amended, whether made before or after the date hereof and irrespective of any general incorporation language in any such filing, except to the extent we specifically incorporate such information by reference.

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters.

The information required by this item of Form 10-K will be included under the captions "Security Ownership of Certain Beneficial Owners and Management," "Director Compensation," and "Executive Compensation" in our 2024 Proxy Statement, and is incorporated herein by reference.

Item 13. Certain Relationships and Related Transactions, and Director Independence.

The information required by this item of Form 10-K will be included under the captions "Certain Relationships and Related Person Transactions," and "Corporate Governance and Board Matters" in our 2024 Proxy Statement, and is incorporated herein by reference.

Item 14. Principal Accounting Fees and Services.

The information required by this item of Form 10-K will be included under the caption "Proposal No. 2— Ratification of Independent Registered Public Accounting Firm" in our 2024 Proxy Statement, and is incorporated herein by reference.

PART IV

Item 15. Exhibits, Financial Statement Schedules.

(a) The following documents are filed as part of this Annual Report on Form 10-K:

(1) All Consolidated Financial Statements

The consolidated financial statements and Report of Independent Registered Public Accounting Firm filed as part of this Annual Report on Form 10-K are listed in the "Index to Consolidated Financial Statements" under Part II, Item 8 of this Annual Report on Form 10-K.

(2) Financial Statement Schedules

All financial statement schedules have been omitted because of the absence of conditions under which they are required or because the required information, where material, is shown in the consolidated financial statements, financial notes or supplementary financial information.

(3) Exhibits

The list of exhibits filed with this Annual Report on Form 10-K is set forth in the Exhibit Index preceding the signature page and is incorporated herein by reference or filed with this Annual Report on Form 10-K, in each case as indicated herein (numbered in accordance with Item 601 of Regulation S-K).

Item 16. Form 10-K Summary

None.

Exhibit Index

Exhibit	Description	Incorporated by Reference			
		Schedule/Form	File Number	Exhibits	Filing Date
3.1	Amended and Restated Certificate of Incorporation of Vaxcyte, Inc., as amended	8-K	001-39323	3.1	June 16, 2020
3.2	Amended and Restated Bylaws of Vaxcyte, Inc., as amended.	10-Q	001-39323	3.2	November 6, 2023
4.1	Form of Common Stock Certificate of the Registrant	S-1/A	333-238630	4.1	June 8, 2020
4.2	Description of Capital Stock.	10-K	001-39323	4.2	March 29, 2021
4.3	Form of Pre-Funded Warrant.	8-K	001-39323	4.1	January 13, 2022
4.4	Form of Pre-Funded Warrant.	8-K	001-39323	4.1	October 27, 2022
4.5	Form of Pre-Funded Warrant.	8-K	001-39323	4.1	April 20, 2023
4.6	Form of Pre-Funded Warrant.	8-K	001-39323	4.1	January 31, 2024
10.1#	Vaxcyte, Inc. Amended and Restated 2014 Equity Incentive Plan and forms of agreements thereunder.	S-1	333-238630	10.2	May 22, 2020
10.2#	Vaxcyte, Inc. 2020 Equity Incentive Plan.	10-Q	001-39323	10.1	August 8, 2023
10.3#	Form of Stock Option Grant Notice and Stock Option Agreement (2020 Equity Incentive Plan).	10-Q	001-39323	10.2	August 8, 2023
10.4#	Form of Restricted Stock Unit Grant Notice (2020 Equity Incentive Plan).	10-Q	001-39323	10.2	May 9, 2022
10.5#	Vaxcyte, Inc. 2020 Employee Stock Purchase Plan.	S-1/A	333-238630	10.4	June 8, 2020
10.6	Form of Indemnification Agreement entered into by and between the Registrant and each director and executive officer.	S-1	333-238630	10.5	May 22, 2020
10.7#	Executive Employment Agreement entered into by and between the Registrant and Grant Pickering, dated January 21, 2016.	S-1	333-238630	10.6	May 22, 2020

Exhibit	Description	Incorporated by Reference			
		Schedule/Form	File Number	Exhibits	Filing Date
10.8#	Executive Employment Agreement entered into by and between the Registrant and Jim Wassil, dated November 15, 2019.	S-1	333-238630	10.11	May 22, 2020
10.9#	Offer Letter entered into by and between the Registrant and Andrew Guggenhime, dated April 16, 2020.	S-1	333-238630	10.13	May 22, 2020
10.10#	Offer Letter entered into by and between the Registrant and Mikhail Eydelman, dated March 4, 2022.	10-Q	001-39323	10.1	May 9, 2022
10.11#	Form of Executive Change in Control and Severance Agreement entered into by and between the Registrant and each eligible employee.	S-1	333-238630	10.14	May 22, 2020
10.12+†	Master Services Agreement for Drug Product Development and Manufacturing between Registrant and Lonza Ltd., dated March 22, 2022, as amended.				X
10.13+†	Development and Manufacturing Services Agreement by and between the Registrant and Lonza Ltd., dated March 1, 2023.	10-Q	001-39323	10.1	May 8, 2023
10.14+†	Commercial Manufacturing and Supply Agreement by and between the Registrant and Lonza Ltd., dated October 13, 2023.				X

Exhibit	Description	Incorporated by Reference			
		Schedule/Form	File Number	Exhibits	Filing Date
10.15+†	Amended and Restated SutroVax Agreement by and between the Registrant and Sutro Biopharma, Inc., dated October 12, 2015, as amended.	S-1	333-238630	10.18	May 22, 2020
10.16+†	Third Amendment to Amended and Restated SutroVax Agreement by and between Sutro Biopharma, Inc. and the Registrant, dated September 28, 2023.	10-Q	001-39323	10.3	November 6, 2023
10.17+†	Supply Agreement by and between the Registrant and Sutro Biopharma, Inc., dated May 29, 2018, as amended.	10-K	001-39323	10.19	February 27, 2023
10.18+†	Option Grant Agreement by and between Registrant and Sutro Biopharma, Inc., dated December 19, 2022.	10-K	001-39323	10.20	February 27, 2023
10.19+†	Manufacturing Rights Agreement by and between the Registrant and Sutro Biopharma, Inc., dated November 21, 2023.				X
10.20+†	License Agreement by and between the Registrant and The Regents of the University of California, represented by its San Diego campus, dated February 4, 2019.	S-1	333-238630	10.20	May 22, 2020
10.21	First Amendment to License Agreement by and between the Registrant and The Regents of the University of California, represented by its San Diego campus, dated August 16, 2019.				X
10.22+†	Lease Agreement by and between the Registrant and ARE-San Francisco No. 63, LLC, dated as of January 21, 2021	8-K	001-39323	10.1	January 25, 2021
10.23	First Amendment to Lease Agreement by and between the Registrant and ARE-San Francisco No. 63, LLC, dated October 17, 2023.				X

Exhibit	Description	Incorporated by Reference			
		Schedule/Form	File Number	Exhibits	Filing Date
10.24+†	Assignment and Assumption of Lease Agreement by and between the Registrant and Codexis, Inc., dated September 1, 2023.	10-Q	001-39323	10.1	November 6, 2023
10.25†	Consent to Assignment and First Amendment by and among ARE-San Francisco No. 63, LLC, Codexis, Inc. and the Registrant, dated September 6, 2023.	10-Q	001-39323	10.2	November 6, 2023
10.26#	Form of Non-U.S. Stock Option Grant Notice and Stock Option Agreement (2020 Equity Incentive Plan).				X
10.27#	Form of Non. U.S. Restricted Stock Unit Grant Notice (2020 Equity Incentive Plan).				X
21.1	Subsidiary of Registrant.				X
23.1	Consent of Independent Registered Public Accounting Firm.				X
24.1	Power of Attorney. Reference is made to the signature page hereto.				X
31.1	Certification of Principal Executive Officer pursuant to Rules 13a-14(a) and 15d-14(a) under the Securities Exchange Act of 1934, as amended.				X
31.2	Certification of Principal Financial Officer pursuant to Rules 13a-14(a) and 15d-14(a) under the Securities Exchange Act of 1934, as amended.				X
32.1*	Certification of Principal Executive Officer and Principal Financial Officer Pursuant to 13a-14(b) or 15d-14(b) of the Securities Exchange Act, as amended, and 18 U.S.C. Section 1350.				X
97.1	Incentive Compensation Recoupment Policy.				X

		Incorporated by Reference			
Exhibit	Description	Schedule/Form	File Number	Exhibits	Filing Date
101.INS	Inline XBRL Instance Document – the instance document does not appear in the Interactive Data File because XBRL tags are embedded within the Inline XBRL document.				X
101.SCH	Inline XBRL Taxonomy Extension Schema With Embedded Linkbase Documents Documents.				X
104	Cover Page Interactive Data File (formatted as inline XBRL and contained in Exhibit 101).				X

X Filed herewith.

+ Pursuant to Item 601(b)(10)(iv) of Regulation S-K, certain portions of this exhibit have been omitted (indicated by "[***]") because we have determined that the information is not material and is the type that we treat as private or confidential.

† Schedules and exhibits to this exhibit have been omitted pursuant to Item 601(a)(5) of Regulation S-K. A copy of any omitted schedule or exhibit will be furnished to the SEC upon request; provided, however, that we may request confidential treatment pursuant to Rule 24b-2 of the Exchange Act for any schedule or exhibit so furnished.

* The certification attached as Exhibit 32.1 that accompanies this Annual Report on Form 10-K is not deemed filed with the Securities and Exchange Commission and is not to be incorporated by reference into any filing of the Registrant under the Securities Act of 1933 (as amended, the "Securities Exchange Act of 1934"), whether made before or after the date of this Annual Report on Form 10-K, irrespective of any general incorporation language contained in such filing.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, as amended, the Registrant has duly caused this Annual Report on Form 10-K to be signed on its behalf by the undersigned, thereunto duly authorized.

Vaxcyte, Inc.

Date: February 27, 2024

By: /s/ Grant E. Pickering
Grant E. Pickering
Chief Executive Officer

POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints Grant E. Pickering and Andrew Guggenhime, and each of them, as his or her true and lawful attorneys-in-fact, each with full power of substitution, for him or her in any and all capacities, to sign any amendments to this Annual Report on Form 10-K and to file the same, with exhibits thereto and other documents in connection therewith, with the SEC, hereby ratifying and confirming all that each of said attorneys-in-fact or their substitute or substitutes may do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Exchange Act of 1934, as amended, this Annual Report on Form 10-K has been signed below by the following persons on behalf of the Registrant in the capacities and on the dates indicated.

Name	Title	Date
/s/ Grant E. Pickering **Grant E. Pickering**	Chief Executive Officer and Director *(Principal Executive Officer)*	February 27, 2024
/s/ Andrew Guggenhime **Andrew Guggenhime**	President and Chief Financial Officer *(Principal Financial Officer)*	February 27, 2024
/s/ Elvia Cowan **Elvia Cowan**	Senior Vice President, Finance *(Principal Accounting Officer)*	February 27, 2024
/s/ Carlos Paya **Carlos Paya, M.D., Ph.D.**	Director	February 27, 2024
/s/ Annie Drapeau **Annie Drapeau**	Director	February 27, 2024
/s/ Halley Gilbert **Halley Gilbert**	Director	February 27, 2024
/s/ Peter Hirth **Peter Hirth, Ph.D.**	Director	February 27, 2024
/s/ Jacks Lee **Jacks Lee**	Director	February 27, 2024
/s/ Teri Loxam **Teri Loxam**	Director	February 27, 2024
/s/ Heath Lukatch **Heath Lukatch, Ph.D.**	Director	February 27, 2024

CONFIDENTIAL

Exhibit 10.12

CERTAIN CONFIDENTIAL INFORMATION CONTAINED IN THIS DOCUMENT, MARKED BY [***], HAS BEEN OMITTED BECAUSE IT IS BOTH (I) NOT MATERIAL AND (II) IS THE TYPE THAT THE REGISTRANT TREATS AS PRIVATE OR CONFIDENTIAL.

Master Services Agreement for Drug Product Development and Manufacturing

(the "Agreement")

by and between

Lonza Ltd
Münchensteinerstrasse 38
CH-4002 Basel
Switzerland

- hereinafter "Lonza" -

and

Vaxcyte, Inc.
825 Industrial Road
Suite 300
San Carlos, CA 94070
United States of America

- hereinafter "Customer" -

Effective as of March 22, 2022 (the "Effective Date")

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Recitals

WHEREAS, Customer is engaged in the development and research of certain products and requires assistance in the development and manufacture of product;

WHEREAS, Lonza and its Affiliates have expertise in the evaluation, development and manufacture of products;

WHEREAS, the Parties have entered into a development and manufacturing services agreement, dated 29 October 2018, for manufacturing services related to the drug product VAX-24, under which Customer was originally named SutroVax, Inc. (the “Original Agreement”);

WHEREAS, Customer wishes to engage Lonza for Services relating to the development and manufacture of the Product as described in this Agreement; and

WHEREAS, Lonza, or its Affiliate, is prepared to perform such Services for Customer on the terms and subject to the conditions set out herein

NOW, THEREFORE, in consideration of the mutual promises contained herein, and for other good and valuable consideration, the Parties intending to be legally bound, agree as follows:

1 Definitions and Interpretation

"Affiliate" means any company, partnership or other entity which directly or indirectly Controls, is Controlled by or is under common Control with the relevant Party. "Control" means the ownership of more than fifty percent (50%) of the issued share capital or the legal power to direct or cause the direction of the general management and policies of the relevant Party.

"Agreement" means this agreement incorporating all Appendices, as amended from time to time by written agreement of the Parties.

"Applicable Laws" means all relevant U.S. and European Union federal, state and local laws, statutes, rules, and regulations which are applicable to a Party's activities hereunder, including, without limitation, the applicable regulations and guidelines of any Governmental Authority and all applicable cGMP together with amendments thereto.

"Approval" means the first marketing approval by the FDA or EMA of Product from the Facility for commercial supply.

"Background Intellectual Property" means any Intellectual Property either (i) owned, licensed or controlled by a Party prior to the Effective Date or (ii) developed or acquired by a Party independently from the performance of the Services hereunder during the Term of this Agreement.

"Batch" means the Product derived from a single run of the Manufacturing Process at a scale to be mutually agreed by the Parties.

"Batch Price" means the Price of each Batch.

"Campaign" means a series of no less than [***] cGMP Batches manufactured consecutively.

"Cancellation Fee" has the meaning given in Clause 6.4.

"Capital Equipment" means those certain pieces of equipment described in the Project Plan: (i) that are specific to the production of the Product and (ii) that are purchased by Customer or for which Customer

reimburses Lonza, including, without limitation, the related documentation regarding the design, validation, operation, calibration and maintenance of such equipment.

"Certificate of Analysis" means a document prepared by Lonza listing tests performed by Lonza or approved External Laboratories, the Specifications and test results.

"cGMP" means those laws and regulations applicable in the U.S. and Europe, relating to the manufacture of medicinal products for human use, including, without limitation, current good manufacturing practices as specified in the ICH guidelines, including without limitation, ICH Q7A "ICH Good Manufacturing Practice Guide for Active Pharmaceutical Ingredients", US Federal Food Drug and Cosmetic Act at 21CFR (Chapters 210, 211, 600, 610, and 820) and the Guide to Good Manufacturing Practices for Medicinal Products as promulgated under European Directive 91/356/EEC. For the avoidance of doubt, Lonza's operational quality standards are defined in internal cGMP policy documents.

"cGMP Batches" means any Batches which are required under the Project Plan to be manufactured in accordance with cGMP.

"Change" means any change to the Services or pricing incorporated into a written amendment to the Agreement in accordance with clause 17.2 or effected in accordance with the Quality Agreement.

"Commencement Date" means the date of commencement of manufacturing activities for a Batch hereunder.

"Confidential Information" means Customer Information and/or Lonza Information, as the context requires.

"Corruption Laws" means all applicable anti-bribery and anti-corruption laws and regulations, including but not limited to the U.S. Foreign Corrupt Practices Act, the U.K. Bribery Act 2010, and the Organization for Economic Co-operation and Development (OECD) Convention on Combating Bribery and Foreign Public Officials in International Business Transactions.

"Customer Information" means all technical and other information which at the time of disclosure by Customer was not known to Lonza or in the public domain relating to the Manufacturing Process and the Product, from time to time supplied by the Customer to

Lonza, including any materials supplied by Customer to Lonza in accordance with the Project Plan.

"Customer Materials" means any Raw Materials or other materials of any nature (e.g., antibodies used in product-specific assays), proprietary to Customer, provided by Customer to Lonza under or in connection with this Agreement, and previously not possessed by or not available to Lonza. For the avoidance of doubt, Drug Substance shall be considered Customer Material.

"Drug Product" means the formulation of the Drug Substance(s) filled into its final containers (e.g., vials).

"Drug Substance" means any proprietary molecule(s) identified in the Project Plan that are to be included in the Drug Product. For clarity, the term Drug Substance may be used interchangeably with Active Pharmaceutical Ingredient (API).

"EMA" means the European Medicines Agency or any successor agency thereto.

"External Laboratories" means any Third Party analytical service provider contracted directly by Customer.

"Facility" means Lonza's manufacturing facilities in Visp and/or Basel Switzerland, or such other facility, including [***], as may be agreed upon by the Parties.

"FDA" means the United States Food and Drug Administration, or any successor agency thereto.

"GDPR" means any applicable data protection or privacy laws, rules and regulations, including but not limited to, the European Union e-Privacy Directive 2002/58/EC, the European Union General Data Protection Regulation 2016/679, the UK Data Protection Act 2018, and any other laws equivalent thereto.

"Governmental Authority" means any Regulatory Authority and any national, multi-national, regional, state or local regulatory agency, department, bureau, or other governmental entity in the U.S., Switzerland or the European Union.

"Intellectual Property" means (i) inventions (whether or not patentable), patents, trade secrets, copyrights, trademarks, trade names and domain names, rights in designs, rights in computer software, database rights, rights in confidential information (including

know-how) and any other intellectual property rights, in each case whether registered or unregistered, (ii) all applications (or rights to apply) for, and renewals or extensions of, any of the rights described in the foregoing clause (i) and (iii) and all rights and applications that are similar or equivalent to the rights and application described in the foregoing clauses (i) and (ii), which exist now, or which come to exist in the future, in any part of the world.

"International Trade Restrictions" means any export control requirements and trade, financial and economic sanctions which apply to this Agreement and the Services under the laws, regulations and rules of the United Nations, the European Union, the United Kingdom, Switzerland and any other relevant jurisdiction; and all necessary export and re-export written consents, permits, and authorizations required by International Trade Restrictions.

"Lonza Information" means all information that is proprietary to Lonza or any Affiliate of Lonza and that is maintained confidence by Lonza or any Affiliate of Lonza and that is disclosed by Lonza or any Affiliate of Lonza to Customer under or in connection with this Agreement, including without limitation, any and all Lonza know-how and trade secrets.

"Manufacturing Instructions" means the document compiled by Lonza and approved by Customer, which defines the manufacturing methods, test methods and other procedures, directions and controls associated with the manufacture and testing of Product.

"Manufacturing Process" means the production process for the manufacture of Product to be developed by Lonza and approved by Customer, as described in the Project Plan.

"New Customer Intellectual Property" has the meaning given in Clause 10.2.

"New General Application Intellectual Property" has the meaning given in Clause 10.3.

"Non-Clinical Batches" means a Batch manufactured under the Project Plan that is not intended as a cGMP Batch, which shall include "Technical Batches", "Toxicology Batches", "Proof-of-Concept Batches" and any other non-cGMP Batches in the Project Plan.

"Party" means each of Lonza and Customer and, together, the "Parties".

“Price” means the price for the Services and Products as set out in Appendix A.

“Product” means the Drug Product manufactured using the Manufacturing Process by Lonza for Customer as specified in the Project Plans. .

“Project Plan” or “Project Plans” means the plans describing the Services to be performed by Lonza under this Agreement, including any update and amendment of the Project Plan to which the Parties may agree from time to time. The initial Project Plans are attached hereto as Appendix A.

“Quality Agreement” means the quality agreement entered into between the parties on May 21 and 22, 2021 by Lonza and Customer respectively.

“Raw Materials” means all ingredients, excipients as well as materials needed to perform the Services, including solvents, consumables/disposables, kits, capillaries, columns, antibody reagents, and other ‘non-standard’ reagents, filters, chromatography resins, cross flow membranes, bags, HPLC columns, specific reagents, infusion sets, pumps, and other components of the Product required to perform the Manufacturing Process or Services (including primary and secondary packaging materials, labels, filters, bags, tubings, dose administration kits and pumps, specific reagents, bioassay etc.). For the avoidance of doubt, Drug Substances are not considered to be Raw Materials.

"Raw Material Fee" means the procurement and handling fee of [***] ([***]%) of the acquisition cost of Raw Materials by Lonza that is charged to the Customer in addition to the cost of such Raw Materials. For clarity, the [***]% Raw Material Fee shall not apply to any Customer Materials or materials produced by Lonza (or any of its Affiliates), under or pursuant to any other written agreement between Lonza and Customer (such as Drug Substances).

“Regulatory Authority” means the FDA, EMA and any other similar regulatory authorities as may be agreed upon in writing by the Parties.

“Release” has the meaning given in Clause 7.1.

“Services” means all or any part of the services to be performed by Lonza under this Agreement (including, without limitation, process and analytical method transfer, process

development, process optimization, validation, non-clinical and clinical manufacturing, as well as quality control and quality assurance activities), particulars of which are set out in a Project Plan.

"Services Data" means data generated by Lonza or any Affiliate or Subcontractor in the course of Lonza's or such entities' performing Services hereunder.

"Specifications" means the analytical tests and acceptance criteria of the Product as agreed between Customer and Lonza during the execution of the Services.

"Subcontractor" means a Third Party contracted directly by Lonza for the purpose of providing services to the Customer as agreed between Customer and Lonza.

"Technical Batch" means a Batch that is intended to demonstrate the transfer of the Manufacturing Process to the Facility.

"Term" has the meaning given in Clause 14.1.

"Third Party" means any party other than Customer, Lonza and their respective Affiliates.

In this Agreement references to the Parties are to the Parties to this Agreement, headings are used for convenience only and do not affect its interpretation, references to a statutory provision include references to the statutory provision as modified or re-enacted or both from time to time and to any subordinate legislation made under the statutory provision, references to the singular include the plural and vice versa, and references to the word "including" are to be construed without limitation.

2 Performance of Services

2.1 Performance of Services. Subject to Clause 2.3, Lonza shall itself and through its Affiliates, diligently carry out the Services as provided in the Project Plan and use commercially reasonable efforts to perform the Services without any material defect and according to the estimated timelines as set forth in the Project Plan. Lonza shall retain appropriately qualified and trained personnel with the requisite knowledge and experience to perform the Services in accordance with this Agreement. With Customer's prior written consent, Lonza may subcontract or delegate any of its rights or obligations under this Agreement to perform the Services, provided, that Lonza shall remain primarily responsible for the actions of any such Subcontractor and/or delegate. Specifically, and without limiting the foregoing, any and all such Subcontractors shall be subject to the same obligations of confidentiality at least as stringent, and as protective of Customer, as those obligations of confidence and non-use imposed upon Lonza and provided that such External Laboratories shall be subject to obligations to act diligently. Lonza shall not be responsible for analytical services performed by External Laboratories.

2.2 Technology Transfer. The Parties expressly agree that they shall work together to transfer the Manufacturing Process to the Facility, including implementing the technology transfer plan set forth in the Project Plan. Customer shall fully support such technology transfer as reasonably requested by Lonza.

2.3 Non-Clinical Batches. Lonza shall manufacture the Non-Clinical Batches (including the Technical Batches) in accordance with the Project Plan. Customer shall have the right to make whatever further use of the Non-Clinical Batches as it shall determine, provided that Customer pays for such Batches, such use is not for human use, and does not violate any Applicable Laws. Lonza makes no warranty that the Non-Clinical Batches (including the Technical Batches) will meet the Specifications, but will manufacture all such Batches in accordance with and for the intended purpose set forth in the Project Plan.

2.4 cGMP Batches. Lonza will, in accordance with the terms of this Agreement and Quality Agreement, manufacture at the Facility and Release to Customer, cGMP Batches that comply with the Manufacturing Process, cGMP and the Specifications, together with a Certificate of Analysis; provided, however, that cGMP manufacture shall not commence until at least [***] has been manufactured in compliance with the Specifications. Prior to commencement of cGMP manufacturing, Lonza shall review the process assumptions. In the event that there is a material difference in the process assumptions as compared with the process results demonstrated during the manufacture of the Technical Batches, the Parties shall meet to discuss in good faith a revision to the Batch Price to reflect such difference.

2.5 Supply of Customer Information and Customer Materials. Customer shall supply to Lonza, free of charge, all Customer Information and Customer Materials and other information or materials that may be reasonably required by Lonza to perform the Services. Lonza shall not be responsible for any delays arising out of Customer's failure to provide such Customer Information, Customer Materials, or other information or materials reasonably required to perform the Services to Lonza, and [***]. The parties shall agree the responsibility for shipment of Customer Materials in the respective Project Plan. Lonza hereby undertakes not to use the Customer Materials or Customer Information (or any part thereof) for any purpose other than the performance of the Services under this Agreement. With respect to any Customer Materials, title shall remain with the Customer and shall not transfer to Lonza.

2.6 Raw Materials. Lonza shall procure all required Raw Materials as well as consumables other than those Raw Materials that are Customer Materials. Customer shall be responsible for payment for all consumables and Raw Materials ordered or irrevocably committed to be procured by Lonza hereunder for the manufacture of the Batches and/or the performance of the Services as agreed upon between the Parties. Upon cancellation of any Batch or termination of the Agreement by Customer, all unused Raw Materials shall be paid for by Customer (to the extent Customer has not previously made such payment to Lonza and to the extent that Raw Materials cannot be used by Lonza for its own use or the use of one of its customers) within [***] of invoice and at Customer's option and cost will either be (a) held by Lonza for future use for the production of Product, (b) delivered to Customer, or (c) disposed of by Lonza.

2.7 Review of Regulatory Submission. Prior to Customer's submission of any information to the Regulatory Authority related in any way to Lonza or the Services provided under this Agreement (including without limitation information related to a Regulatory Authority's request for additional information or an inspection, and Customer's answer or other response thereto), Customer shall provide to Lonza copies thereof. Any regulatory support activities (including pre-Approval inspection) required and agreed

to by Customer to support the Approval of the Drug Product or Product from the Facility shall be performed and supported by Lonza as reasonably requested by Customer. All such regulatory support activities shall be approved by the Customer in advance, and shall be paid for by the Customer at the Price set out in the applicable Project Plan. For the sake of clarity, the Parties agree that Lonza shall provide regulatory review, at the agreed hourly rate/day rate, with respect to all documents related to any regulatory submission. Customer shall submit those documents in time to Lonza in order for Lonza to review and provide comments for Customer's consideration at Customer's sole discretion on those sections referring to Lonza and related to the Services hereunder.

3 Project Management / Steering Committee

3.1 Project Plans. With respect to a new project to be governed by this Agreement, a new Project Plan shall be added by agreement in a writing signed by the Parties and appended to Appendix A. Each Project Plan shall include a description of the Services to be provided, the Product to be manufactured, Specifications, a schedule for completion of the Project Plan, pricing details, and such other information as is necessary for relevant Services. In the event of a conflict between the terms of a Project Plan and this Agreement, the terms of this Agreement will govern.

3.2 Project Management. With respect to each Project Plan, each Party will appoint a project manager who will be the Party responsible for overseeing the Project Plan.

3.3 Steering Committee. Each Party shall name a mutually agreed upon roughly equal number of representatives for the Steering Committee, which shall meet twice per calendar year, or as otherwise mutually agreed by the Parties. In the event that a Steering Committee dispute cannot be resolved, such dispute shall be escalated to a senior executive of each of Customer and Lonza.

The primary function of the Steering Committee is to ensure the ongoing communication between the Parties and discuss and resolve any issues arising under this Agreement. In addition to the primary function described above, the Steering Committee shall also take on the following responsibilities:

3.3.1 discuss and seek resolution of issues around management of the Services;

3.3.2 agree and monitor deadlines and milestones for the Services; and

3.3.3 discuss and recommend any changes to the Services (although such changes will not take effect until they have been incorporated into a written amendment to the Project Plan which has been signed by the Parties).

3.4 Person in Plant. During manufacturing of a Technical Batch, Customer shall be permitted to have [***] at the drug product manufacturing Facility as reasonably requested by Customer, at any time during the Manufacturing Process for the purpose of observing, reporting on, and consulting as to the performance of the Services. During manufacturing of the GMP Batches, Customer shall be permitted to have [***] at the drug product manufacturing Facility as reasonably requested by Customer, at any time during the GMP Manufacturing Process for the purpose of observing and reporting on the performance of the Services.

Furthermore, unless otherwise agreed to by the Parties, if Lonza does not have suitable space at Lonza's Services site for drug product ("Drug Product Services

Site"), Customer shall [***]. In addition, Customer shall be permitted [***] within the Drug Product Services Site as visitor(s), for visits over periods to be determined by mutual agreement to (a) facilitate real-time (same time-zone) communications between Customer technical drug product team and the Lonza drug product team, (b) facilitate transfer of process and analytical technology between the companies; (c) facilitate master batch record review and approval process; (d) perform technical review of manufacturing batch data; and/or (e) augment program management by providing local input.

Each such Customer employee or authorized representative shall be subject to and agree to abide by confidentiality obligations to Third Parties and Lonza's customary practices, and such employee agrees to comply with all instructions of Lonza's employees at the drug product manufacturing Facility and/or Drug Product Services Site.

4 Quality

4.1 Responsibility for quality assurance and quality control of Product shall be allocated between Customer and Lonza as set forth in the Quality Agreement and in Lonza standard operating procedures. If there is a conflict between the terms and conditions of this Agreement and the Quality Agreement, the terms and conditions of this Agreement shall prevail. If the Quality Agreement is not in place at the Effective Date, Lonza and Customer commit to enter into the Quality Agreement in a timely manner, but in no event later than the commencement of cGMP manufacturing.

4.2 Provisions regarding inspections by Regulatory Authorities and audits shall be set out in the Quality Agreement.

5 Insurance

5.1 Customer shall, during the Term prior to any clinical use of the Product, obtain and maintain at its own cost and expense from a qualified insurance company, comprehensive general liability insurance in the amount of at [***]. Customer shall at least [***] prior to the first clinical use of a Product manufactured or Services provided under this Agreement, and for [***] after delivery of the last such Product, obtain and maintain at its own cost and expense from a qualified insurance company, comprehensive general liability insurance including, but not limited to product liability coverage in the amount of at least [***]. Lonza shall, during the Term and for [***] after delivery of the last Product manufactured or Services provided under this Agreement, obtain and maintain at its own cost and expense from a qualified insurance company, comprehensive general liability insurance including, but not limited to product liability coverage in the amount of at least [***] per claim. Each Party shall provide the respective other Party with a certificate of such insurance upon reasonable request.

6 Forecasting, Ordering and Cancellation

6.1 Forecasting. To the extent not already set forth in the then-current Project Plan, no later than the [***], Customer shall supply Lonza with a written forecast showing Customer's good faith estimated [***] requirements for Batches for the [***] period (the "Forecast"). No later than [***] following Lonza's receipt of a Forecast, Lonza shall inform the Customer of [***] and shall provide Customer with an estimated production schedule showing the estimated Commencement Date and estimated delivery date of each Batch. The forecast and [***] given in this Clause 6.1 shall not be binding on Customer or Lonza.

6.2 Purchase Orders. Customer shall place purchase orders binding on Customer for the number of Batches it wishes to order at least [***] (or earlier as [***]) prior to the Commencement Date for such Batches in accordance with Lonza's most recent response to the Forecast. Each binding purchase order shall be signed by Customer and shall authorize Lonza to manufacture such Batches of the Product as are set forth therein. Lonza shall not be obligated to commence manufacture of any Batch unless and until such written purchase order is accepted in writing by Lonza. Any delivery date set forth in Lonza's written confirmation of a purchase order shall be an estimated delivery date only. All ordered Batches shall be scheduled in a single Campaign in each calendar year unless otherwise agreed by Lonza. Any additional or inconsistent terms or conditions of any Customer purchase order, acknowledgement or similar standardized form given or received pursuant to this Agreement shall have no effect and such terms and conditions are hereby rejected. For clarity, the then-current Project Plan shall be deemed a binding Purchase Order for the Batches set forth in the Project Plan with the Commencement Date of such Batches being the commencement dates set forth in the Project Plan, and Customer shall not be required to place separate Purchase Orders for such Batches to make them binding. Customer shall have the right to reschedule and/or cancel any of the Batches in the Project Plan in the same manner and pursuant to the same terms and conditions as the rescheduling and cancellation set forth in Clauses 6.3 through 6.6 as if they were the Batches ordered through a Purchase Order.

6.3 Rescheduling. Lonza shall have the right to reschedule a Commencement Date of any Batch or Campaign upon reasonable prior written notice to Customer, provided that the rescheduled Commencement Date is less than [***] from the Commencement Date originally estimated at the time of Lonza's acceptance of the binding purchase order, and further provided that Customer is able to provide the necessary Customer Materials. If the Customer requests to change the Commencement Date, Lonza will make all reasonable attempts to accommodate the request; provided, however, in the event that this change would impact other projects scheduled for occupancy in the designated suite or suites, manufacture of the Customer's Batch or Campaign may be delayed until an adequate time period is available in the Facility schedule. Unless otherwise agreed, any such change requested by Customer may result in a rescheduling fee. Ordinary updates to the schedule during the execution of the Project Plan (via contract amendment /scope change) shall not be subject to a rescheduling fee.

6.4 Cancellation of a Binding Purchase Order. Customer may cancel a binding purchase order upon written notice to Lonza, subject to the payment of a cancellation fee as calculated below (the "Cancellation Fee"):

6.4.1 Development work: If Customer provides written notice of cancellation of any Development Work, Customer shall pay for any of the cancelled Development Work Lonza performed prior to the date of notification of cancellation and for any of such cancelled Development Work which would (were it not for the cancellation) have been performed during the period of [***] days post cancellation notification, unless otherwise agreed in the specific scope of work..

6.4.2 Batches scheduled in a cGMP Facility: In the event that Customer provides written notice of cancellation to Lonza:

(a) less than or equal to [***] prior to the Commencement Date of the first subject Batch, then [***] ([***]%) of the Batch Price of each such Batch cancelled is payable;

(b) more than [***] but less than or equal to [***] prior to the Commencement Date of the first subject Batch, then [***] ([***]%) of the Batch Price of each such Batch cancelled is payable;

(c) more than [***] prior to the Commencement Date of a subject Batch, then no Cancellation Fee is payable.

6.4.3 Notwithstanding the provisions of Clause 6.4.2, (i) Lonza will use commercially reasonable efforts to reschedule its Facility to mitigate any losses from a cancellation, and if Lonza is able to reallocate any reserved capacity for the performance of services for any third party during the applicable period, then Customer's obligation to pay the amounts under Clauses 6.4.1 or 6.4.2, shall be reduced pro-rata based on the use of such capacity for such third party during the applicable period; and (ii) notwithstanding anything to the contrary, no Cancellation Fee is payable by Customer for any cancellation or rescheduling to the extent resulting from Lonza's action or inaction, either under this Agreement or the Original Agreement or otherwise. In particular, Customer may ask to replace the cancelled Services with another Customer project, subject to Lonza's feasibility review and approval.

6.5 Payment of Cancellation Fee. Any Cancellation Fee shall be payable within [***] following the written notice of cancellation associated with the cancelled Batch. Any Cancellation Fee shall include all costs associated with the cancelled Batch, including any Raw Materials.

6.6 Replacement Project. Notwithstanding the foregoing, Lonza will use commercially reasonable efforts to secure a new project (but excluding any project then under contract with Lonza) for the cGMP manufacturing space, and for the same dates and duration that would have been occupied by Customer, and then, in such case, the Cancellation Fee for each Batch cancelled that is replaced by a Batch of the new project shall be reduced by an amount equal to [***] ([***]%) of the production fees associated with such replacement Batch.

7 Delivery and Acceptance

7.1 Delivery. All Drug Product shall be delivered FCA to the Facility (as defined by Incoterms® 2020), unless otherwise agreed in the Statement of Work. Lonza shall deliver to Customer the Certificate of Analysis and such other documentation as is reasonably required to meet all applicable regulatory requirements of the Governmental Authorities not later than the date of delivery of Batches (the "Release"). With respect to Drug Product, title and risk of loss shall remain with Lonza until Release and shall transfer to Customer upon Release in accordance with this provision.

7.2 Storage. Product Batches will be stored at no charge for up to [***] after Release; provided that any additional storage beyond [***] will be subject to availability and, if available, will be charged to Customer and will be subject to a separate agreement. Customer shall arrange for shipment and take delivery of such Batch(es) from the Facility, at Customer's expense, within [***] after Release or pay applicable storage costs, unless otherwise agreed to by the Parties. Lonza shall provide storage on a bill and hold basis for such Batch(es) at no charge for up to [***]; provided that any additional storage beyond [***] will be subject to availability and, if available, will be charged to Customer and will be subject to a separate agreement. In addition, Customer shall be responsible for all value added tax (VAT) and any other applicable taxes, levies, import, duties and fees of whatever nature imposed as a result of any storage. Unless otherwise agreed to by the Parties, in no event shall Lonza be required

to store any Batch for more than [***] after Release. Within [***] following a written request from Lonza, Customer shall provide Lonza with a letter in form satisfactory to Lonza confirming the bill and hold status of each stored Batch.

7.3 Acceptance/Rejection of Product.

7.3.1 Promptly following Release of Batches, Customer shall inspect such Batches and shall have the right to test such Batches to determine compliance with the Specifications. Customer shall notify Lonza in writing of any rejection of a Batch based on any claim that it fails to meet Specifications within [***] of Release, after which time all unrejected Batches shall be deemed accepted.

7.3.2 In the event that Lonza believes that a Batch has been incorrectly rejected, Lonza may require that Customer provide to Lonza Batch samples for testing. Lonza may retain and test the samples of such Batch. In the event of a discrepancy between Customer's and Lonza's test results such that Lonza's test results fall within relevant Specifications, or there exists a dispute between the Parties over the extent to which such failure is attributable to a given Party, the Parties shall cause an independent laboratory promptly to review records, test data and perform comparative tests and/or analyses on samples of the Product that allegedly fails to conform to Specifications. Such independent laboratory shall be mutually agreed upon by the Parties. The independent laboratory's results shall be in writing and shall be final and binding save for manifest error. Unless otherwise agreed to by the Parties in writing, the costs associated with such testing and review shall be borne by the Party against whom the independent laboratory rules.

7.3.3 Lonza shall replace any Batch that failed to conform with the Specifications (a "Failed Batch"). In the event that it is determined (by the Parties or the independent laboratory) that such failure was [***] ("Lonza Responsibility"), Lonza agrees to [***]. The compensation is capped at [***]% of the price of that Failed Batch. If any replacement cGMP Batch provided as replacement for a Failed Batch also fails to conform to the Specifications due to Lonza's Responsibility, then the Steering Committee shall decide in its sole discretion, if Lonza shall either replace such cGMP Batch or refund the amounts paid by Customer for such cGMP Batch. Such replacement shall be made as promptly as practicable, in light of available manufacturing capacity, after the confirmation of Lonza Responsibility, and in any case as soon as reasonably possible after confirmation of Lonza Responsibility. Where possible, such replacement Batch shall be manufactured with the next scheduled cGMP Batch or Campaign. Customer acknowledges and agrees that its [***] with respect to a Failed Batch that is a Lonza Responsibility is [***].

8 Price and Payment

8.1 Pricing for the Services provided by Lonza are set out in, and based on the assumptions and information set out in, the applicable Project Plan. In the event of changes to the Services based on Customer's request, Customer shall bear all additional costs. Conversely, if Services scope of work within the Project Plan is reduced by formal contract amendment / scope change, Lonza shall revise quoted price to accurately reflect the reduced Services.

8.2 Unless otherwise indicated in writing by Lonza, all Prices and charges are exclusive of value added tax (VAT) and of any other applicable taxes, levies, import, duties and fees of whatever nature imposed by or under the authority of any government or public

authority and all such charges applicable to the Services (other than taxes on Lonza's income) shall be paid by Customer. When sending payment to Lonza, the Customer shall quote the relevant invoice number in its remittance advice.

8.3 Lonza shall issue invoices to Customer for [***] ([***]%) of the Price for Products or Services upon commencement thereof (the "Initiation Payment") and [***] ([***]%) upon Release of applicable Batches or completion of applicable Services (the "Completion Payment"), unless otherwise stated in the Project Plan. Charges for Raw Materials and the Raw Materials Fee for each Batch shall be invoiced upon the Release of each Batch or completion of applicable Services. Charges for consumables and wearables, as well as charges for Services provided by External Laboratories, shall be invoiced upon the Release of the applicable Batch or completion of applicable Services at cost plus a fee of [***] ([***]%). All invoices are strictly net and payment must be made within [***] of date of invoice. Payment shall be made without deduction, deferment, set-off, lien or counterclaim, except as set forth in the Agreement or any Amendments. The provisions of this Clause 8.3, including the rate of markup charges set forth herein and in the definition of Raw Materials Fees, shall apply prospectively to all Services under the Agreement.

8.4 If in default of payment of any undisputed invoice on the due date, interest shall accrue on any amount overdue at the lesser of (i) rate of [***] ([***]%) per month above the Swiss Average Rate Overnight (SARON) or (ii) the maximum rate allowable by applicable law, interest to accrue on a day to day basis until full payment; and Lonza shall, at its sole discretion, and without prejudice to any other of its accrued rights, be entitled to suspend the provision of the Services and or delivery of Product until all overdue amounts have been paid in full including interest for late payments.

8.5 Price adjustments.

8.5.1 Not more than once per calendar year, Lonza may adjust the Price in accordance with [***] for the previous calendar year. The new Price reflecting such Batch Price adjustment shall be effective for any Batch for which the Commencement Date is on or after the date of Lonza's notice to Customer of the Price adjustment.

8.5.2 In addition to the above, the Price may be changed by Lonza, upon reasonable prior written notice to Customer (providing reasonable detail in support thereof), to reflect (i) an increase in variable costs (such as energy) by more than [***] ([***]%) (based on the initial Price or any previously amended Price), or for a process adjustment or assumption changes, and (ii) any material change in an environmental, safety or regulatory standard that substantially impacts Lonza's cost and ability to perform the Services, in each case to the extent not already passed through to Customer.

9 Capital Equipment

9.1 Upon agreement between the Parties, Lonza shall use commercially reasonable efforts to purchase Capital Equipment in a timely manner so as not to delay any of the Services to be performed by Lonza under a Project Plan. Parties shall notify each other in writing sufficiently in advance in the event that a Party foresees such purchase requirement.

10 Intellectual Property

10.1 Except as expressly otherwise provided herein, neither Party will, as a result of this Agreement, acquire any right, title, or interest in any Background Intellectual Property of the other Party.

10.2 Subject to Clause 10.3, Customer shall own all right, title, and interest in and to any and all Intellectual Property that Lonza and/or its Affiliates, the External Laboratories or other contractors or agents of Lonza develops, conceives, invents, first reduces to practice or makes, solely or jointly with Customer or others, in the performance of the Services, to the extent such Intellectual Property is a direct derivative of or improvement to the Drug Product, Product, Drug Substances, Customer Materials, Customer Information and/or Customer Background Intellectual Property (collectively, the "New Customer Intellectual Property"). For avoidance of doubt, "New Customer Intellectual Property" shall include any material, processes or other items that solely embody, or that solely are claimed or covered by, any of the foregoing Intellectual Property, but excluding any New General Application Intellectual Property.

10.3 Notwithstanding Clause 10.2, and subject to the license granted in Clause 10.5, Lonza shall own all right, title and interest in Intellectual Property that Lonza and/or its Affiliates, the External Laboratories or other contractors or agents of Lonza, solely or jointly with Customer, develops, conceives, invents, or first reduces to practice or makes in the course of performance of the Services to the extent such Intellectual Property (i) is generally applicable to the development or manufacture of chemical or biological products or product components, and could reasonably have been made without the use of the Drug Product, Drug Substances, Customer Materials, Customer Information, or Customer Background Intellectual Property or (ii) is an improvement of, or direct derivative of, any Lonza Information or Lonza Background Intellectual Property ("New General Application Intellectual Property"). For avoidance of doubt, "New General Application Intellectual Property" shall include any material, processes or other items that embody, or that are claimed or covered by, any of the foregoing Intellectual Property.

10.4 Lonza hereby assigns to Customer all of its right, title and interest in any New Customer Intellectual Property. Lonza shall execute, and shall require its personnel as well as its Affiliates, External Laboratories or other contractors or agents and their personnel involved in the performance of the Services to execute, any documents reasonably required to confirm Customer's ownership of the New Customer Intellectual Property, and any documents required to apply for, maintain and enforce any patent or other right in the New Customer Intellectual Property. Customer hereby assigns to Lonza all of its right, title and interest in any New General Application Intellectual Property. Customer shall execute, and shall require its personnel as well as its Affiliates and their personnel involved in the performance of the Services to execute, any documents reasonably required to confirm Lonza's ownership of the New General Application Intellectual Property, and any documents required to apply for, maintain and enforce any patent or other right in the New General Application Intellectual Property.

10.5 Subject to the terms and conditions set forth herein (including the payment of the Price as required above), Lonza hereby grants to Customer a non-exclusive, world-wide, fully paid-up, irrevocable, transferable license, including the right to grant sublicenses, under the New General Application Intellectual Property, to research, develop, make, have made, use, sell and import the Product.

10.6 Customer hereby grants Lonza the non-exclusive right to use the Drug Substances, Drug Product, Product, Customer Materials, Customer Information, Customer Background Intellectual Property and New Customer Intellectual Property during the Term solely for the purpose of fulfilling its obligations under this Agreement.

10.7 Customer will have the right to transfer the Manufacturing Process to itself, its Affiliates and/or any third Party, provided, however, to the extent such technology transfer includes Lonza Confidential Information, or Lonza Background Intellectual Property, such technology transfer to any Third Party shall be subject to [***] and a reasonable royalty and/or licensing fee and terms to be agreed upon by the Parties. Lonza will not include in the Manufacturing Process any Lonza Confidential Information or Lonza Background Intellectual Property that would require Customer to pay any additional payment and/or royalty to Lonza in order to transfer the Manufacturing Process to itself, its Affiliates and/or any Third Party without first obtaining Customer's prior written consent and advising Customer as to the royalty structure and any other payment that would apply for the use of such Lonza Confidential Information or Lonza Background Intellectual Property. If Customer has provided such consent and the Manufacturing Process includes the use of any such additional payment-bearing or royalty-bearing Lonza Confidential Information or Lonza Background Intellectual Property, then Customer will pay to Lonza an agreed royalty and/or other agreed payments for the use of Lonza Confidential Information or Lonza Background Intellectual Property. Lonza shall provide reasonably necessary documents to complete such technology transfer, including transfer of New General Application Intellectual Property, if applicable, and subject to the terms and conditions of this Clause 10.7, Lonza Confidential Information or Lonza Background Intellectual Property, if incorporated into the Manufacturing Process with Customer's consent, and Customer shall reimburse Lonza for any costs (based on a full-time employee rate for such support) and expenses, provided that the total cost of such assistance (excluding any costs paid to Lonza for the use of Lonza's Confidential Information or Lonza Background Intellectual Property) will not exceed [***].

10.8 Data Usage. Notwithstanding the confidentiality provisions in Clause 13 as they may relate to the use of Services Data, the Parties agree that all Services Data may be collected, aggregated, hosted, mined or otherwise stored and maintained by Lonza and its Affiliates, Subcontractors and External Laboratories in a data platform utilized by Lonza to develop and improve services for the benefit of Lonza's customers (the "Data Platform"). Customer hereby grants to Lonza a non-exclusive, royalty-free, worldwide, perpetual and irrevocable license solely to use Services Data in a blinded and aggregated format for Lonza's purposes of (i) research, development, commercialization of, and securing rights to, development, manufacturing and testing systems, platforms, and service offerings, and (ii) use of the Data Platform for provision of services to Lonza's customers, provided that the obligations set forth in this Clause shall at all times apply. As used in this Clause, "blinded" means neither Customer nor Drug Substances, Drug Product, Product, Customer Materials, Customer Information, Customer Background Intellectual Property and New Customer Intellectual Property or any other Customer property or information are identifiable.

11 Warranties

11.1 Lonza warrants that:

11.1.1 the Services shall be performed in a professional and workmanlike manner and in accordance with all Applicable Laws;

11.1.2 Lonza will not knowingly include in the Manufacturing Process any elements that infringe any intellectual property rights controlled by any Third Party;

11.1.3 except with respect to any development services and Non-Clinical Batches (including the Technical Batches), the manufacture of Product shall be performed in accordance with cGMP and will meet the Specifications at the

date of delivery;

11.1.4 the manufacture of the Non-Clinical Batches (including the Technical Batches) shall be performed as required in the Project Plan;

11.1.5 it or its Affiliate holds all necessary permits, approvals, consents and licenses to enable it to perform the Services at the Facility;

11.1.6 it has the necessary corporate authorizations to enter into and perform this Agreement;

11.1.7 Lonza has never been debarred under the Generic Drug Enforcement Act of 1992, 21 U.S.C. Sec. 335a (a) or (b) (the "Act"). In the event that during the term of this Agreement, Lonza becomes debarred, suspended, excluded, sanctioned, or otherwise declared ineligible under the Act; Lonza agrees to promptly notify Customer. Lonza also agrees that in the event that it becomes debarred, suspended, excluded, sanctioned, or otherwise declared ineligible under the Act, it shall promptly cease all activities relating to this Agreement; and

11.1.8 subject to payment of undisputed invoices, title to all Product and all New Customer Intellectual Property provided to Customer under this Agreement shall pass free and clear of any security interest, lien or other encumbrance in favour of Lonza.

11.2 Customer warrants that:

11.2.1 as of the date of this Agreement to the best of the Customer's knowledge and belief, the Customer has all the rights necessary to permit Lonza to perform the Services without infringing the Intellectual Property rights of any Third Party and the performance of the Services shall not infringe any Third Party Intellectual Property rights;

11.2.2 Customer will promptly notify Lonza in writing if it receives or is notified of a formal written claim from a Third Party that Customer Information and/or Customer Intellectual Property or that the use by Lonza thereof for the provision of the Services infringes any Intellectual Property or other rights of any Third Party; and

11.2.3 Customer has the necessary corporate authorizations to enter into this Agreement.

11.3 DISCLAIMER: THE WARRANTIES EXPRESSLY SET FORTH IN THIS AGREEMENT ARE IN LIEU OF ALL OTHER WARRANTIES, AND ALL OTHER WARRANTIES, BOTH EXPRESS AND IMPLIED, ARE EXPRESSLY DISCLAIMED, INCLUDING WITHOUT LIMITATION ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

11.4 Debarment.

11.4.1 In the event a Party receives a notice from the other party ("Defaulting Party") or otherwise becomes aware that a debarment, suspension, exclusion, sanction, or declaration of ineligibility action has been brought against the Defaulting Party; then the Party receiving such notice shall have the right to terminate this Agreement immediately; provided that if such event shall occur,

the Party receiving such notice shall not have such right of termination if the Defaulting Party is disputing and defending such action and the Defaulting Party is otherwise able to perform its services in the manner required under this Agreement.

11.4.2 Each Party shall ensure that it will not knowingly use in any capacity the services of any individual, corporation, partnership or association which has been debarred under 21 U.S.C. Sec. 335a(a) or (b), or listed in the DHHS/OIG List of Excluded Individuals/Entities or the General Services Administration's Listing of Parties Excluded from Federal Procurement and Non-Procurement Programs.

12 Indemnification and Liability

12.1 Indemnification by Lonza. Lonza shall indemnify the Customer, its Affiliates, and their respective officers, employees and agents ("Customer Indemnitees") for any loss, damage, costs and expenses (including reasonable attorney fees) that Customer Indemnitees may suffer as a result of any Third Party claim arising directly out of [***] except, in each case, to the extent that such claims resulted from the negligence, intentional misconduct or breach of this Agreement by any Customer Indemnitees. Notwithstanding the foregoing, Lonza shall have no obligations under this Clause 12.1 for any liabilities, expenses, or costs to the extent arising out of or relating to claims covered under Clause 12.2.

12.2 Indemnification by Customer. Customer shall indemnify Lonza, its Affiliates, and their respective officers, employees and agents ("Lonza Indemnitees") from and against any loss, damage, costs and expenses (including reasonable attorney fees) that Lonza Indemnitees may suffer as a result of any Third Party claim arising directly out of [***]; except, in each case, to the extent that such claims resulted from the negligence, intentional misconduct or breach of this Agreement by any Lonza Indemnitees. Notwithstanding the foregoing, Customer shall have no obligations under this Clause 12.2 for any liabilities, expenses, or costs to the extent arising out of or relating to claims covered under Clause 12.1.

12.3 Indemnification Procedure. If the Party to be indemnified intends to claim indemnification under this Clause 12, it shall promptly notify the indemnifying Party in writing of such claim. The indemnitor shall have the right to control the defense and/or settlement thereof; provided, however, that (i) the indemnitor must obtain the prior written consent of the indemnitee (not to be unreasonably withheld) before entering into any settlement of such Third Party claim, and (ii) any indemnitee shall have the right to retain its own counsel at its own expense. The indemnitee, its employees and agents, shall reasonably cooperate with the indemnitor in the investigation of any liability covered by this Clause 12. The failure to deliver prompt written notice to the indemnitor of any claim, to the extent prejudicial to its ability to defend such claim, shall relieve the indemnitor of any obligation to the indemnitee under this Clause 12.

12.4 DISCLAIMER OF CONSEQUENTIAL DAMAGES. IN NO EVENT SHALL EITHER PARTY BE LIABLE TO THE OTHER PARTY FOR INCIDENTAL, INDIRECT, SPECIAL, PUNITIVE OR CONSEQUENTIAL DAMAGES, LOST PROFITS OR LOST REVENUES ARISING FROM OR RELATED TO THIS AGREEMENT, EXCEPT TO THE EXTENT RESULTING FROM FRAUD, GROSS NEGLIGENCE OR INTENTIONAL MISCONDUCT AND/OR FOR EITHER PARTY'S BREACH OF ARTICLE 13 HEREOF.

12.5 LIMITATION OF LIABILITY. LONZA'S LIABILITY UNDER THIS AGREEMENT SHALL IN NO EVENT EXCEED, IN THE AGGREGATE, [***], EXCEPT TO THE EXTENT RESULTING FROM LONZA'S FRAUD, GROSS NEGLIGENCE OR INTENTIONAL MISCONDUCT.

13 Confidentiality

13.1 A Party receiving Confidential Information (the "Receiving Party") agrees to strictly keep secret any and all Confidential Information received during the Term from or on behalf of the other Party (the "Disclosing Party") using at least the same level of measures as it uses to protect its own Confidential Information, but in any case at least commercially reasonable and customary efforts. Confidential Information shall include information disclosed in any form including but not limited to in writing, orally, graphically or in electronic or other form to the Receiving Party, observed by the Receiving Party or its employees, agents, consultants, or representatives, or otherwise learned by the Receiving Party under this Agreement, which the Receiving Party knows or reasonably should know is confidential or proprietary.

13.2 Notwithstanding the foregoing, Receiving Party may disclose to any courts and/or other authorities Confidential Information which is or will be required pursuant to applicable governmental or administrative or public law, rule, regulation or order. In such case the Party that received the Confidential Information will, to the extent legally permitted, inform the other Party promptly in writing and cooperate with the Disclosing Party in seeking to minimize the extent of Confidential Information which is required to be disclosed to the courts and/or authorities.

13.3 The obligation to maintain confidentiality under this Agreement does not apply to Confidential Information, which:

13.3.1 at the time of disclosure was publicly available; or

13.3.2 is or becomes publicly available other than as a result of a breach of this Agreement by the Receiving Party; or

13.3.3 as the Receiving Party can establish by competent proof, was rightfully in its possession at the time of disclosure by the Disclosing Party and had not been received from or on behalf of Disclosing Party; or

13.3.4 is supplied to a Party by a Third Party which was not in breach of an obligation of confidentiality to Disclosing Party or any other party; or

13.3.5 is developed by the Receiving Party independently from and without use of the Confidential Information, as evidenced by contemporaneous written records.

13.4 The Receiving Party will use Confidential Information only for the purposes of this Agreement and will not make any use of the Confidential Information for its own separate benefit or the benefit of any Third Party including, without limitation, with respect to research or product development or any reverse engineering or similar testing. The Receiving Party agrees to return or destroy promptly (and certify such destruction) on Disclosing Party's request all written or tangible Confidential Information of the Disclosing Party, except that one copy of such Confidential Information may be kept by the Receiving Party in its confidential files for record keeping purposes only.

13.5 Each Party will restrict the disclosure of Confidential Information to such officers, employees, professional advisers, finance-providers, consultants and representatives of itself and its Affiliates who have been informed of the confidential nature of the Confidential Information and who have a need to know such Confidential Information for the purpose of this Agreement or an applicable financing or acquisition. Both Parties may disclose Confidential Information of the other Party and its Affiliates to potential and actual acquirers provided such disclosure is limited to the terms of this Agreement. Customer also may disclose to its potential and actual: (i) acquirers and (ii) bona fide collaborators in the research, development and commercialization of the Products, the work product provided to Customer by Lonza as a consequence of the provision of the Services. Prior to disclosure to such persons, the Receiving Party shall inform the Disclosing Party and it shall bind its and its Affiliates' officers, employees, consultants and representatives to confidentiality and non-use obligations no less stringent than those set forth herein. The Receiving Party shall notify the Disclosing Party as promptly as practicable of any unauthorized use or disclosure of the Confidential Information.

13.6 The Receiving Party shall at any time be fully liable for any and all breaches of the confidentiality obligations in this Clause 13 by any of its Affiliates or the employees, consultants, potential and actual acquirers, and representatives of itself or its Affiliates.

13.7 Each Party hereto expressly agrees that any breach or threatened breach of the undertakings of confidentiality provided under this Clause 13 by a Party may cause irreparable harm to the other Party and that money damages may not provide a sufficient remedy to the non-breaching Party for any breach or threatened breach. In the event of any breach and/or threatened breach, then, in addition to all other remedies available at law or in equity, the non-breaching Party shall be entitled to seek injunctive relief and any other relief deemed appropriate by the non-breaching Party.

14 Term and Termination

14.1 Term. This Agreement shall commence on the Effective Date and shall end on the fifth (5^{th}) anniversary of the Effective Date unless terminated earlier as provided herein or extended by mutual written consent of the Parties (the "Term"). Notwithstanding the foregoing, each Project Plan may have separate term and termination provisions so long as the term of any Project Plan does not extend beyond the Term.

14.2 Termination. This Agreement may be terminated as follows:

14.2.1 by either Party for any reason upon [***] prior written notice; provided that Lonza may not provide such notice until the [***] anniversary of the Effective Date. In such an event all cancellation terms in this Agreement shall apply (except, in the case of termination by Lonza pursuant to Clause 14.2.1, the Cancellation Fees shall not apply), and the Customer shall make payments for work commenced and performed under any purchase order(s) by Lonza prior to the termination notice date;

14.2.2 by either Party if the other Party breaches a material provision of this Agreement or a Project Plan and fails to cure such breach to the reasonable satisfaction of the non-breaching Party within [***] ([***] for non-payment) following written notification of such breach from the non-breaching party to the breaching party; provided, however, that such [***] period shall be extended as agreed by the Parties if the identified breach is incapable of cure within [***] and if the breaching Party provides a plan and timeline to cure the breach, promptly commences efforts to cure the breach and diligently prosecutes such

cure [***];

14.2.3 by either Party, immediately, if the other Party becomes insolvent, is dissolved or liquidated, makes a general assignment for the benefit of its creditors, or files or has filed against it, a petition in bankruptcy or has a receiver appointed for a substantial part of its assets; or

14.2.4 by either Party pursuant to Clause 15.

14.3 Consequences of Termination. In the event of termination hereunder, Lonza shall be compensated for (i) Services rendered up to the date of termination, including in respect of any Product in-process; (ii) all costs incurred through the date of termination, including Raw Materials costs and Raw Materials Fees for Raw Materials used or purchased for use in connection with the Project Plan; (iii) all unreimbursed Capital Equipment and related decommissioning charges incurred pursuant to Clause 9; (iv) all Cancellation Fees due under Clause 6.4. In the case of termination by Lonza for Customer's material breach, Cancellation Fees shall be calculated as of the date of written notice of termination.

14.4 Survival. The rights and obligations of each Party which by their nature survive the termination or expiration of this Agreement shall survive the termination or expiration of this Agreement, including Clauses 5, 10-13 and 16 (to the extent relevant).

15 Force Majeure

15.1 If Lonza is prevented or delayed in the performance of any of its obligations under the Agreement by Force Majeure and gives written notice thereof to Customer specifying the matters constituting Force Majeure together with such evidence as Lonza reasonably can give and specifying the period for which it is estimated that such prevention or delay will continue, Lonza shall be excused from the performance or the punctual performance of such obligations as the case may be from the date of such notice for so long as such cause of prevention or delay shall continue. Provided that, if such Force Majeure persists for a period of [***] or more, Customer may terminate this Agreement by delivering written notice to Lonza.

15.2 "Force Majeure" shall be deemed to include any reason or cause beyond Lonza's reasonable control affecting the performance by Lonza of its obligations under the Agreement, including, but not limited to, any cause arising from or attributable to acts of God, strike, labor troubles, restrictive governmental orders or decrees, riots, insurrection, war, terrorist acts, or the inability of Lonza to obtain any required raw material, energy source, equipment, labor or transportation, at prices and on terms deemed by Lonza to be reasonably practicable, from Lonza's usual sources of supply.

15.3 With regard to Lonza, any such event of Force Majeure affecting services or production at its Affiliates or suppliers shall be regarded as an event of Force Majeure.

16 Additional Covenants

16.1 Each Party shall comply with, and shall cause its Affiliates, subsidiaries, subcontractors, directors, officers, employees, agents or any other person acting on behalf of Lonza to comply with, all applicable Corruption Laws and International Trade Restrictions, and shall obtain all necessary export and re-export written consents, permits, and authorizations required by International Trade Restrictions; and

16.2 In connection with the preparation and the performance of this Agreement, each Party shall take appropriate technical and organizational measures to comply with the GDPR, to the extent it is applicable. Lonza shall in compliance with GDPR as well as on Customer's request, destroy all personal data, unless Applicable Law prevents Lonza from such destruction. Lonza confirms that any personal identifiable data shared with Customer for the purposes of the Services, the preparation and the performance of this Agreement is done in accordance with the requirements of the GDPR.

17 Miscellaneous

17.1 Severability. If any provision hereof is or becomes at any time illegal, invalid or unenforceable in any respect, neither the legality, validity nor enforceability of the remaining provisions hereof shall in any way be affected or impaired thereby. The Parties hereto undertake to substitute any illegal, invalid or unenforceable provision by a provision which is as far as possible commercially equivalent considering the legal interests and the Purpose.

17.2 Amendments. Modifications and/or amendments of this Agreement must be in writing and signed by the Parties.

17.3 Assignment. Lonza shall be entitled to instruct one or more of its Affiliates to perform any of Lonza's obligations contained in this Agreement, but Lonza shall remain fully responsible in respect of those obligations. Neither Party may assign its interest under this Agreement without the prior written consent of the other Party, such consent not to be unreasonably withheld, conditioned or delayed, provided, however that either Party may assign this Agreement to (i) any Affiliate of such Party or (ii) any third party in connection with the sale or transfer (by whatever method) of all or substantially all of the assets of the business or Product of such Party to which this Agreement relates, whether by merger, consolidation, acquisition or other form of business combination. Any purported assignment without a required consent shall be void. No assignment shall relieve any Party of responsibility for the performance of any obligation that accrued prior to the effective date of such assignment. Lonza shall be entitled to sell, assign and/or transfer its trade receivables resulting from this Agreement without the consent of the Customer.

17.4 Notice. All notices must be written and sent to the address of the Party first set forth above. All notices must be given (a) by personal delivery, with receipt acknowledged, (b) by facsimile followed by hard copy delivered by the methods under (c) or (d), (c) by prepaid certified or registered mail, return receipt requested, or (d) by prepaid recognized next business day delivery service. Notices will be effective upon receipt or at a later date stated in the notice.

17.5 Governing Law/Jurisdiction. This Agreement is governed in all respects by the laws of [***], without regard to its conflicts of laws principles. The Parties agree to submit to the jurisdiction of the state and federal courts located in [***].

17.6 Entire Agreement. This Agreement contains the entire agreement between the Parties as to the subject matter hereof and supersedes all prior and contemporaneous agreements with respect to the subject matter hereof. This Agreement may be executed in any number of counterparts, each of which shall be deemed to be an original, and all of which together shall constitute one and the same document. Each Party acknowledges that an original signature or a copy thereof transmitted by facsimile or by .pdf shall constitute an original signature for purposes of this Agreement.

IN WITNESS WHEREOF, each of the Parties hereto has caused this Development and Manufacturing Services Agreement to be executed by its duly authorized representative effective as of the date written above.

[SIGNATURES FOLLOW ON THE NEXT PAGE]

LONZA LTD

By: /s/ Albert Pereda
Name Albert Pereda

Title

Date 13-Apr-2022

By: /s/ Bernd Stefer
Name Bernd Stefer

Title

Date 13-Apr-2022

Vaxcyte, Inc.

By: /s/ Grant Pickering
Name Grant Pickering

Title CEO

Date 4/12/2022

APPENDIX A

Project Plan A

[***]

CERTAIN CONFIDENTIAL INFORMATION CONTAINED IN THIS DOCUMENT, MARKED BY [***], HAS BEEN OMITTED BECAUSE IT IS BOTH (I) NOT MATERIAL AND (II) IS THE TYPE THAT THE REGISTRANT TREATS AS PRIVATE OR CONFIDENTIAL.

FIRST AMENDMENT TO DEVELOPMENT AND MANUFACTURING SERVICES AGREEMENT

This First Amendment (the "**First Amendment**"), comes into effect on May 12, 2022 (the "**First Amendment Effective Date**"), is made by and between Lonza Ltd ("**Lonza**") and Vaxcyte, Inc. ("**Vaxcyte**" or "**Customer**"). This First Amendment is to be incorporated as part of the Development and Manufacturing Services Agreement, dated March 22, 2022, between Lonza and Vaxcyte (the "**Original Agreement**"). Lonza and Vaxcyte, hereafter referred to as a "**Party**" and collectively as the "**Parties."**

Whereas:

1. Lonza and Vaxcyte entered into the Original Agreement which the Parties now desire to amend;

2. The Parties wish to amend the Original Agreement by adding a new Project Plan B, attached hereto, in the Appendix A of the Original Agreement.

NOW, THEREFORE, the Parties hereby agree that the following amendments are made to the Original Agreement:

1. All capitalized terms used herein shall have the meaning set forth in the Original Agreement.

2. The Parties hereby agree that the wording attached herein shall be added to the Original Agreement Appendix A as Project Plan B.

3. All other terms and conditions of the Original Agreement, as amended, shall remain in full force and effect. In the event of any conflict between the terms and conditions of this First Amendment and the Original Agreement, the terms and conditions set forth in the Original Agreement shall control.

IN WITNESS WHEREOF, Vaxcyte and Lonza hereby enter into this First Amendment, effective as of the Tenth Amendment Effective Date.

VAXCYTE, INC LONZA LTD

By: /s/ Grant Pickering By: /s/ Bernd Stefer
Name: Grant Pickering Name:
Title: CEO Title:

By: By: /s/ Albert Pereda
Name: Name:
Title: Title:

APPENDIX A

Project Plan B

[***]

CERTAIN CONFIDENTIAL INFORMATION CONTAINED IN THIS DOCUMENT, MARKED BY [***], HAS BEEN OMITTED BECAUSE IT IS BOTH (I) NOT MATERIAL AND (II) IS THE TYPE THAT THE REGISTRANT TREATS AS PRIVATE OR CONFIDENTIAL.

SECOND AMENDMENT TO DEVELOPMENT AND MANUFACTURING SERVICES AGREEMENT

This Second Amendment (the "**Second Amendment**"), comes into effect on November 21, 2022 (the "**Second Amendment Effective Date**"), is made by and between Lonza Ltd ("**Lonza**") and Vaxcyte, Inc. ("**Vaxcyte**" or "**Customer**"). This Second Amendment is to be incorporated as part of the Development and Manufacturing Services Agreement, dated March 22, 2022, between Lonza and Vaxcyte (the "**Original Agreement**"). Lonza and Vaxcyte, hereafter referred to as a "**Party**" and collectively as the "**Parties**."

Whereas:

1. Lonza and Vaxcyte entered into the Original Agreement which the Parties now desire to amend;

2. The Parties wish to modify the Project Plan A for the manufacturing of the Customer's [***].

NOW, THEREFORE, the Parties hereby agree that the following amendments are made to the Original Agreement:

1. All capitalized terms used herein shall have the meaning set forth in the Original Agreement.

2. The Parties hereby agree that the wording attached herein shall replace the Original Agreement Appendix A as **Project Plan A**. [***].

3. All other terms and conditions of the Original Agreement, as amended, shall remain in full force and effect. In the event of any conflict between the terms and conditions of this Second Amendment and the Original Agreement, the terms and conditions set forth in the Original Agreement shall control.

IN WITNESS WHEREOF, Vaxcyte and Lonza hereby enter into this Second Amendment, effective as of the Tenth Amendment Effective Date.

VAXCYTE, INC **LONZA LTD**

By: /s/ Grant Pickering
Name: Grant Pickering
Title: CEO

By: /s/ Albert Pereda
Name
Title:

By:
Name:
Title:

By: /s/ Bernd Stefer
Name
Title:

Appendix A

Project Plan A

[***]

CERTAIN CONFIDENTIAL INFORMATION CONTAINED IN THIS DOCUMENT, MARKED BY [***], HAS BEEN OMITTED BECAUSE IT IS BOTH (I) NOT MATERIAL AND (II) IS THE TYPE THAT THE REGISTRANT TREATS AS PRIVATE OR CONFIDENTIAL.

THIRD AMENDMENT TO DEVELOPMENT AND MANUFACTURING SERVICES AGREEMENT

This Third Amendment (the "**Third Amendment**"), comes into effect on October, 31st, 2023 (the "**Third Amendment Effective Date**"), is made by and between Lonza Ltd ("**Lonza**") and Vaxcyte, Inc. ("**Vaxcyte**" or "**Customer**"). This Third Amendment is to be incorporated as part of the Development and Manufacturing Services Agreement, dated March 22, 2022, between Lonza and Vaxcyte (the "**Original Agreement**"). Lonza and Vaxcyte, hereafter referred to as a "**Party**" and collectively as the "**Parties**."

Whereas:

1. Lonza and Vaxcyte entered into the Original Agreement which the Parties now desire to amend;

2. The Parties hereby agree that the wording attached herein shall be added to the Original Agreement Appendix A as Project Plan C.

NOW, THEREFORE, the Parties hereby agree that the following amendments are made to the Original Agreement:

1. All capitalized terms used herein shall have the meaning set forth in the Original Agreement.

2. The Parties hereby agree that the wording attached herein shall be added to the Original Agreement Appendix A as **Project Plan C**. [***]

3. All other terms and conditions of the Original Agreement, as amended, shall remain in full force and effect. In the event of any conflict between the terms and conditions of this Third Amendment and the Original Agreement, the terms and conditions set forth in the Original Agreement shall control.

IN WITNESS WHEREOF, Vaxcyte and Lonza hereby enter into this Third Amendment, effective as of the Third Amendment Effective Date.

VAXCYTE, INC.	**LONZA LTD**
By: /s/ Jim Wassil	By: /s/ Andrea Lindemann
Name: Jim Wassil	Name: Andrea Lindemann
Title: Executive VP and COO	Title: Head of Commercial Development, DPS
	By: /s/ Albert Pereda

Name: Name: Albert Pereda
Title: Title: Assistant General Counsel

Appendix A

Project Plan C

[***]

Execution Version

Exhibit 10.14

CERTAIN CONFIDENTIAL INFORMATION CONTAINED IN THIS DOCUMENT, MARKED BY [***], HAS BEEN OMITTED BECAUSE IT IS BOTH (I) NOT MATERIAL AND (II) IS THE TYPE THAT THE REGISTRANT TREATS AS PRIVATE OR CONFIDENTIAL.

PRE-COMMERCIAL SERVICES AND COMMERCIAL MANUFACTURING SUPPLY AGREEMENT

By and between

Lonza Ltd
Münchensteinerstrasse 38
CH-4002 Basel
Switzerland

- hereinafter “Lonza” –

And

Vaxcyte Switzerland GmbH in the process of incorporation (*in Gründung*)

- hereinafter “Vaxcyte” –

represented by:
Vaxcyte, Inc.
825 Industrial Road
Suite 300
San Carlos, CA 94070
U.S.A.

- hereinafter “Vaxcyte US” –

Effective as of October 13, 2023 (the “Effective Date”)

RECITALS

WHEREAS, Vaxcyte is a Swiss limited liability company that is in the process of being formed by Vaxcyte US;

WHEREAS, Vaxcyte US is, and Vaxcyte is intended to be, engaged in the development and research of certain products and requires assistance in the manufacture of certain products;

WHEREAS, Lonza has expertise in evaluating the design and construction of dedicated manufacturing suites as well as the evaluation, development and manufacture of products;

WHEREAS, Vaxcyte wishes to engage Lonza for new Services relating to a) the Pre-Commercial Services (defined below); b) construction, commissioning and commercial operation of the Suite (defined below), and c) the manufacture of Vaxcyte's Products (defined below) in the Suite;

WHEREAS, Lonza, is prepared to perform such Services for Vaxcyte on the terms and subject to the conditions set out herein; and

WHEREAS, Vaxcyte US is acting hereunder in the name of Vaxcyte, and Vaxcyte is intended to assume this CMSA within [***] after its incorporation in accordance with art. 779a para. 2 of the Swiss Code of Obligations to the release of Vaxcyte US. Vaxcyte US shall have the right to cause such assumption by Vaxcyte as soon as Vaxcyte is registered in the competent Swiss commercial register.

NOW, THEREFORE, in consideration of the mutual promises contained herein, and for other good and valuable consideration, the parties intending to be legally bound, agree as follows:

1. Definitions and Interpretation

"Actual Annual Yield" has the meaning given in Section 5.4.1.

"Additional Services" means services not covered by or provided as part of Suite Fees, FTE Fees or other standard fees paid by Vaxcyte under this CMSA.

"Affected Party" has the meaning given in Section 19.

"Affiliates" means any company, partnership or other entity which directly or indirectly Controls, is Controlled by or is under common Control with the relevant Party. For the purposes of this definition, "Control" means the ownership of more than fifty percent (50%) of the issued share capital or other ownership interests of such entity or the legal power to direct or cause the direction of the general management and policies of the relevant entity, whether through the ownership of voting securities, by contract or otherwise.

"Agency Model" means the procurement and management of [***] in connection with this CMSA, subject to the terms and conditions as further described in Appendix G.

"Agency Model Goods" has the meaning given in Appendix G Section 2.

"ANMAT" means the Administración Nacional de Medicamentos, Alimentos y Tecnología Médica, and any successor agency thereto.

"Annual Shortfall" has the meaning given in Section 5.4.2.

"Applicable Laws" means all relevant laws, statutes, rules, and regulations of any jurisdiction which are applicable to a Party's activities hereunder, including, without limitation, the applicable regulations and guidelines of any Regulatory Authority and all applicable cGMP together with amendments thereto.

"Background Intellectual Property" means any Intellectual Property either [***].

"Batch" means [***].

"Batch Forecast" has the meaning given in Section 6.1.

"BHRA" means the Brazilian Health Regulatory Agency (Anvisa), and any successor agency thereto.

"Buffer" means [***].

"Build-out" has the meaning given in Section 2.4.

"CapEx Prepayment" has the meaning given in Appendix C Section 7(a).

"Capital Expenditure" has the meaning given in Appendix C Section 1.

"Casualty" has the meaning given in Section 23.1.

"Casualty Estimate" has the meaning given in Section 23.2.

"Casualty Restoration" has the meaning given in Section 23.1.

"Casualty Termination" means termination pursuant to Section 23.2.

"Certificate of Analysis" or "COA" means a document prepared by Lonza listing tests performed by Lonza or approved External Laboratories which certifies that a particular Product meets the Specifications and all testing criteria which are set by Vaxcyte or which are set forth in the applicable Product regulatory filings.

"cGLP" or **"GLP"** means those laws and regulations applicable in the U.S. and Europe, relating to laboratory practices as specified in the ICH guidelines, including, without limitations, US Federal Food Drug and Cosmetic Act at 21CFR Part 58 and as promulgated under European Directive 2004/9/EC and Directive 2004/10/EC.

"cGMP" or **"GMP"** means those laws and regulations applicable in the U.S. and Europe, relating to the manufacture of medicinal products for human use, including, without limitation, current good manufacturing practices as specified in the ICH guidelines, including, without limitation, ICH Q7A "ICH Good Manufacturing Practice Guide for Active Pharmaceutical Ingredients", US Federal Food Drug and Cosmetic Act at 21 CFR (Chapters 210, 211, 600 and 610) and the Guide to Good Manufacturing Practices for Medicinal Products as promulgated under European Directive 91/356/EEC. For the avoidance of doubt, Lonza's operational quality standards are defined in internal cGMP policy documents.

“CHF” has the meaning given in Section 10.8.

“Claim” has the meaning given in Section 15.1.

“CMSA” means this Pre-Commercial Services and Commercial Manufacturing Supply Agreement incorporating all Appendices, as amended from time to time by written agreement of the Parties.

“Code” means the Uniform Commercial Code as in effect in the State of Delaware from time to time.

[***].

“Commercial Manufacturing Process” means the [***].

“Competitive Product” means [***].

“Compliance Period” has the meaning given in Section 2.8.

“**Cost”** means actual direct costs paid for a good or service to a Third Party minus [***] and excluding any margin, markup, fees, Taxes, or profit.

“Confidential Information” means Vaxcyte Information and/or Lonza Information.

“Credit Note” means a credit note issued by a Party that is immediately effective and may be used to offset any moneys owned by the receiving Party to the issuing Party under this CMSA. [***].

[***].

**[***].

“Delivery Date” means the delivery date for Product listed on the Production Scheduling Form.

“Design Documents” means the drawings, documentation and specifications in respect of the Build-out prepared by Lonza, its Affiliates or any subcontractor for use in connection with this CMSA.

“Disclosing Party” has the meaning given in Section 16.1.

“Documentation” has the meaning given in Section 10.14.

“Drug Substance” or “DS” means [***].

“Effective Date” has the meaning given on the cover page.

“EMA” means the European Medicines Agency or any successor agency thereto.

“Engineering Batch” means [***].

"Existing Equipment" means existing equipment contributed by Lonza as further detailed in Appendix C, Table C-4.

"External Laboratories" means any Third Party subcontracted by Lonza, with Vaxcyte's prior written consent which shall not be unreasonably withheld or delayed, which is to conduct activities required to complete the Services.

"Facility" means [***].

"Failed Batch" means [***].

"FDA" means the United States Food and Drug Administration, or any successor agency thereto.

"**Force Majeure**" means, except as otherwise expressly provided in this CMSA, any reason or cause beyond a Party's reasonable control after exercising customary care and planning affecting the performance by a Party of its obligations under the CMSA, including, but not limited to, any cause arising from or attributable to acts of God, strike, lockouts, labor troubles, restrictive governmental orders or decrees, riots, insurrection, war, terrorist acts, and – with respect to Lonza – the inability to obtain any required raw material, energy source, equipment, labor or transportation or other item or with respect to Vaxcyte – the inability to obtain equipment, labor or transportation or other item in order for Lonza to provide the Services or complete the Build-out (exclusive of applicable delays inherent in ordering long lead items and hiring employees, provided the Party in question had done the reasonably appropriate planning and provided for the reasonably appropriate lead time for performing or obtaining such long lead items and hiring such employees). For clarity, (a) prevalence of the Covid pandemic/endemic shall not be deemed a Force Majeure event as long as there is no impact on laboratory, and operational continuity to operate as usual, and (b) under no circumstances shall the non-payment of money or a failure attributable to a lack of funds or lack of financing be deemed to be (or to have caused) a Force Majeure event. With regard to a Party, any such event of Force Majeure affecting services or production at its Affiliates or its suppliers shall be regarded as an event of Force Majeure.

"Force Majeure Termination" has the meaning given in Section 19.

"FTE" has the meaning given in Appendix E Section 1.

"FTE Fee" has the meaning in Appendix E Section 1.

"FTE Forecast" has the meaning given in Section 6.1.

"FTE Rate" has the meaning in Appendix E Section 2.

"**Hand Over**" means after the handover of the Suite to Lonza operations team following [***].

"HC" means Health Canada, and any successor agency thereto.

"Initial Term" has the meaning given in Section 17.

"Installation Qualification" means the verification that equipment being qualified has been installed and configured according to the manufacturer's specifications or installation checklist.

"Intellectual Property" means: [***].

"IQOQ" means Installation Qualification and Operational Qualification.

"Joint Project Team" or **"JPT"** has the meaning given in Section 4.2.1.

"Joint Steering Committee" or **"JSC"** has the meaning given in Section 4.2.1.

"KPI" means the key performance indicators/milestones set forth in this CMSA, which shall be reviewed and evaluated in good faith by the JSC on an annual basis.

"Letter Agreement" mean the Letter Agreement Regarding New Intellectual Property Ownership Rights by and between the Parties dated September 15, 2021, attached hereto as Appendix I.

[***].

"Lonza" has the meaning given on the cover page.

"Lonza CapEx Exposure" has the meaning given in Appendix C Section 3.

"Lonza Finance Designee" has the meaning given in Section 10.10.

"Lonza Funded Capital Expenditure" has the meaning given in Appendix C Section 5.

"Lonza Indemnitees" has the meaning given in Section 15.2.

"Lonza Information" means [***].

"Lonza Manufactured Product Components" means [***].

"Lonza Regulatory Failure" has the meaning given in Section 18.4.1.

"Lonza Supplied Raw Materials" means any Raw Materials provided by Lonza (including if procured by Lonza pursuant to Section 5 of Appendix G).

"Loss" has the meaning given in Section 15.1.

"Low-Cost Countries" means a group of countries and territories where [***].

"**Manufacturing Process**" means the Commercial Manufacturing Process and/or the Vaxcyte Manufacturing Process.

"Margin" means a margin of [***]. For clarity, the margin for a particular payment from Vaxcyte to Lonza shall be calculated as [***].

"MHRA" means the Medicines and Healthcare Products Regulatory Agency, and any successor agency thereto.

"**New Vaxcyte Intellectual Property"** has the meaning given in Section 13.2.

"New General Application Intellectual Property" has the meaning given in Section 13.3.

"NMPA" means the National Medical Products Administration, and any successor agency thereto.

"Operational Qualification" means validation that equipment performance is consistent with the user requirement specification within the manufacturer specific operating ranges (i.e., identifying and inspecting equipment features that can impact the Product quality).

"OTIF" means on time-in full and is a metric focused on whether Lonza delivers the correct quantity (e.g., expected yield) of the applicable Product on or before the applicable Delivery Date set forth in the applicable Production Scheduling Form.

"Party" means each of Lonza and Vaxcyte and, together, the "Parties".

"PCV" means pneumococcal conjugate vaccine.

"PMDA" means the Pharmaceutical and Medical Devices Agency, and any successor agency thereto.

"Polysaccharide" or **"PS"** means polysaccharide intermediate manufactured by Lonza.

"PPQ Batch" means [***].

"Pre-Commercial Services" means all services related to preparation of manufacturing execution and qualification as detailed in Appendix J. The Pre-Commercial Services will be provided to Vaxcyte independent from the commercial manufacturing of the Batches.

"Premises" means the Facility and the land on which it was built as well as surrounding structures, including other Lonza buildings.

"Product" means [***].

"Production Scheduling Form" means the scheduling form submitted by Vaxcyte to Lonza for manufacturing services which contains (a) Product/item ID ordered; (b) quantity ordered; and (c) Delivery Date.

"Quality Agreement" means a written agreement between the Parties which governs the technical aspects and quality of the Product.

"Raw Materials" means [***].

"Receiving Party" has the meaning given in Section 16.1.

"Regulatory Authority" means (i) Swissmedic, FDA, EMA, and MHRA, (ii) commencing as of a date to be reasonably agreed by the Parties through the JSC (but in any event, not prior to Vaxcyte's or its Affiliates' filing of the first biologics license application for a Product in the United States), HC, PMDA, TGA, NMPA, BHRA and ANMAT, and (iii) any other foreign drug, health or medical regulatory authority national, multi-national, regional, state or local regulatory agency, department, bureau, or other governmental entity regulating the development, registration, manufacture and sale of pharmaceuticals in the Territory (as such Territory may be expanded from time to time in accordance with Section 2.8).

“Release Documentation” means documents delivered to Vaxcyte which are necessary for full release of Product, including, a Certificate of Analysis, Batch record, TSE/BSE statements, and other documents and material required to be delivered under this CMSA, the Quality Agreement and the Production Scheduling Form.

“Renewal Term” has the meaning given in Section 17.

“Repurposing Fee” has the meaning given in Section 10.4.

“Required Rating” has the meaning given in Section 11.1.

“Review Period” had the meaning given in Section 13.9.2.

“Services” means all or any part of the services performed or required to be performed by Lonza under this CMSA and, the extent applicable, the Quality Agreement.

“Services Schedule” means a mechanism for scheduling services not covered by the FTE Fees, Suite Fees or other designated fees for the Suite under this CMSA, including, but not limited to, Additional Services and new equipment procurement.

“SOFR” means rate last quoted as of the time of determination by New York Federal Reserve as “secured overnight financing rate” in the United States.

“SOX” means the Sarbanes-Oxley Act of 2002, as amended.

“Specifications” means, with respect to the Product, the ingredient list, formulation, manufacturing instructions, testing requirements, full release criteria and handling requirements and other directions for the manufacture and supply of the Product as provided by Vaxcyte in writing, as the same may be amended from time to time in accordance with the procedures set forth in the Quality Agreement. Specifications shall include all documentation required to describe, control, and assure the quality of the Product.

“Suite” means [***], as described in more detail in Appendix B.

“Suite Fee” has the meaning given in Appendix D Section 1.

“Swissmedic” means the Swiss Agency for Therapeutic Products, or any successor agency thereto.

“Swissmedic Facility Approval” means regulatory approval of the Facility, including the Suite, to manufacture commercial Product.

“Target Yield” has the meaning given in Section 5.4.1.

“Target Yield Determination Batches” has the meaning given in Section 5.4.1.

“Tax” or **“Taxes”** means any and all U.S. federal, state, county, local, non-U.S. and other taxes of any kind whatsoever (including, without limitation, income, profits, premium, estimated, excise, sales, use, service, turnover, value-added, occupancy, gross receipts, franchise, ad valorem, severance, capital levy, production, transfer, license, stamp, environmental, withholding, employment, unemployment compensation, payroll related and property taxes, tonnage, import

duties, customs duties, imposts, tariffs, levies and other governmental charges or assessments), whether or not measured in whole or in part by net income, and including deficiencies, interest, additions to tax or interest, and penalties with respect thereto, and including expenses associated with contesting any proposed adjustment related to any of the foregoing.

"Term" has the meaning given in Section 17.

"Termination Obligations" means all amounts owed to Lonza by Vaxcyte pursuant to the terms of Sections 18.4.1, 18.4.2, and 18.4.3.

"**Territory**" means [***].

"TGA" means the Therapeutic Goods Administration, and any successor agency thereto.

"Third Party" mean any person or entity other than Lonza, Vaxcyte or their respective Affiliates.

[***].

"Vaxcyte" has the meaning given on the cover page.

"Vaxcyte Delay" has the meaning given in Appendix B.

"Vaxcyte Indemnitees" has the meaning given in Section 15.1.

"Vaxcyte Information" means [***].

"**Vaxcyte Manufacturing Process**" means [***].

"Vaxcyte Supplied Raw Materials" means [***].

In this CMSA references to the Parties are to the Parties to this CMSA, headings are used for convenience only and do not affect its interpretation, references to a statutory provision include references to the statutory provision as modified or re-enacted or both from time to time and to any subordinate legislation made under the statutory provision, references to the singular include the plural and vice versa, unless specified as a business day all days are calendar days, and section headings are included solely for convenience and reference. Most tables are intended for reference purposes only and in the event of a conflict between a table and language in the CMSA, the language in the CMSA shall control.

2. PERFORMANCE

2.1 PRODUCT SUPPLY. Lonza shall diligently manufacture Product in accordance with the prevailing industry standards, cGMPs, this CMSA, the Quality Agreement, Specifications, the Production Scheduling Form, and applicable Regulatory Authority requirements and guidance and Applicable Laws. Lonza shall retain appropriately qualified and trained personnel with the requisite knowledge and experience to manufacture Product in accordance with this CMSA. Lonza is responsible for full Product release which includes, but is not limited to, [***]. The above release timeframes shall not be applicable to Engineering Batches and [***]. Lonza shall provide Vaxcyte with as much advance notice as reasonably possible if Lonza determines that any manufacturing will be delayed or otherwise adversely impacted for any reason and shall use all commercially reasonable efforts to correct or otherwise mitigate any such delays or adverse

impact. Vaxcyte shall use commercially reasonable efforts to cooperate with Lonza with respect to release of Product in accordance with the timelines set forth in this Section 2.1.

2.2 SUBCONTRACTING. Lonza may subcontract Services under this CMSA with prior written approval from Vaxcyte, such approval not to be unreasonably withheld or delayed. Any Vaxcyte approved subcontractor shall be (a) subject to the same applicable obligations and other provisions contained in this CMSA, including obligations of confidentiality and non-use at least as stringent, and as protective of Vaxcyte and Vaxcyte Information, as those obligations of confidentiality and non-use imposed upon Lonza, and (b) subject to obligations to comply with Applicable Laws (including applicable cGMP and/or cGLP). In the event Vaxcyte approves such subcontractor, Lonza shall (i) be responsible for the services performed (and all related actions and inactions) by subcontractors, and (ii) not be relieved or released from any obligations under this CMSA, and any delay caused by any such subcontractor shall be the sole responsibility of Lonza. Any analytical testing services subcontracted to External Laboratories which are required for the COA, whether Lonza or Vaxcyte has the oversight, shall be the responsibility of Lonza. All such test results shall be listed on Lonza's COA delivered to Vaxcyte as part of the Release Documentation. Third Party subcontractor fees and expenses incurred after Hand Over shall be billed to Vaxcyte at [***], and Third Party subcontractor fees and expenses incurred prior to Hand Over shall be billed to Vaxcyte at [***].

2.3 PRE-COMMERCIAL SERVICES. As part of this CMSA, Vaxcyte requests Lonza to provide certain pre-commercial services and deliverables (as further detailed in Appendix J), for which Lonza is entitled to receive a pre-commercial service fee pursuant to, and as set forth in, Section 10.3. These pre-commercial services are provided in addition to and independent from the agreed build-out and services after handover compensated through Capital Expenditures, Suite Fee, FTE Fee and other fees for the commercial manufacturing of the Batches under this CMSA.

2.4 BUILD-OUT. Lonza shall build the Suite in accordance with the timelines and descriptions for which the Parties have aligned and otherwise in compliance with the terms and conditions of this CMSA (the "Build-out"). The Parties respective obligations, specifications and other requirements relating to the Build-out are contained in Appendix C attached hereto and made a part hereof. Such Appendix C may be revised from time to time upon written agreement of the Parties. Lonza, however, shall not be responsible for any delays to the extent constituting a Vaxcyte Delay. Lonza shall be responsible for the procurement of all equipment and materials that are part of the Capital Expenditures and construction and installation thereof as provided in Appendix C, attached hereto. Notwithstanding the foregoing, Lonza shall be responsible for procurement, installation, operation, repair, and maintenance of any capital equipment generally required to maintain operations of the Facility at its own cost and expense.

2.5 ADDITIONAL SERVICES. Vaxcyte may request that Lonza provide Additional Services. In the event an Additional Service cannot be provided by an FTE assigned to Vaxcyte, Vaxcyte and Lonza shall separately agree in writing, via a Services Schedule, on the costs thereof. Pricing for Additional Services shall be as follows (a) with respect to labor, pricing shall be [***], and (b) with respect to goods, materials and Third Party services, [***]. For the avoidance of doubt, Lonza shall not be obligated to provide any such Additional Service, and Vaxcyte shall not be obligated to pay for any such Additional Service, unless and until the Parties sign a Services Schedule. Examples of Additional Services include [***]. For clarity, first Regulatory Authority inspection, routine production, quality control release, and quality assurance activities for the production are covered under the fees of this CMSA.

2.6 New Equipment Purchases. Vaxcyte may request Lonza to purchase and install new manufacturing and related equipment in the Suite to be documented in a Services Schedule. Any such new equipment shall be paid for by Vaxcyte at [***] and installed by Lonza (directly or through subcontractors) at [***].

2.7 Services Standards. Lonza shall perform the Services with the same degree of diligence, effort, care, skill and prudence it ordinarily uses in the performance of similar activities for itself and for Third Parties and, without limiting the foregoing, in accordance with this CMSA, the Quality Agreement and all Applicable Laws. Lonza shall employ standard operating procedures relating to its performance of the Services that are at least consistent with the standard operating procedures customarily used by Lonza when engaging in similar activities for itself, its Affiliates and for Third Parties (including in respect of accounting for costs relating thereto).

2.8 Territory Expansion. Vaxcyte may expand the Territory upon reasonable notice to Lonza, and Lonza shall use commercially reasonable efforts to become compliant therewith on such timeline as reasonably agreed upon between the Parties (such time period, the "Compliance Period"); provided, that: [***]. Upon the earlier of (i) Lonza's compliance with such additional jurisdiction and Vaxcyte obtaining regulatory approval in such jurisdiction, and (ii) the conclusion of the Compliance Period, "Regulatory Authority" and "Territory" shall be deemed to be updated as applicable to include such jurisdiction.

3. Facility; Suite; Equipment

3.1 Maintenance and Operations.

3.1.1 Maintenance and Operation of the Premises. Lonza shall have the primary oversight and responsibility for the maintenance of the Premises at its own expense but subject to allocation through Suite Fees, and shall maintain any other areas relevant to the manufacture of Product(s) or necessary to provide the Services in a state of repair and operating efficiency (which shall include procuring and keeping on hand at the Premises reasonable quantities of spare and replacement parts) consistent and compliant with the requirements of cGMP and other Applicable Laws. This obligation shall include but not be limited to: [***].

3.1.2 Maintenance and Operation of the Suite. Lonza shall have the primary oversight and responsibility for the operation of the Suite, and shall maintain any other areas relevant to the manufacture of Product(s) or necessary to provide the Services in a state of repair and operating efficiency [***] consistent and compliant with the requirements of cGMP and other Applicable Laws. This obligation shall include, but not be limited to: [***].

3.2 Ownership.

3.2.1 Facility. Lonza shall own the Facility, including the Suite, excluding items listed in Section 3.2.2.

3.2.2 Equipment. Vaxcyte shall own (a) any equipment paid for by Vaxcyte, and (b) any Existing Equipment, to the extent Vaxcyte exercised the option under this CMSA to [***] in accordance with Appendix C Section 8 and Table C-4.

3.3 Regulatory Licenses. Lonza shall obtain and maintain the Swissmedic manufacturing license (which will be in agreement with FDA and EMA regulations) for the Suite at its own expense and such expenses are part of the Pre-Commercial Services and shall not be subject to

any further reimbursement by Vaxcyte under the provisions of this CMSA. To the extent required by any applicable Regulatory Authority outside of Switzerland and specific only to or required only for Lonza's work for Vaxcyte, Lonza shall (a) fully cooperate with and support Vaxcyte to file and maintain required submissions and registrations with such Regulatory Authority, and (b) file and maintain the required submissions and registration with such Regulatory Authority if such Regulatory Authority requires Lonza to hold the registration (including FDA). Lonza's compliance with (a) and (b) of this Section 3.3 shall be at Vaxcyte's cost and expense.

3.4 Exclusive Use. Lonza shall use the Suite solely and exclusively to provide Services for Vaxcyte and its Affiliates, which may include the manufacture of any clinical stage or commercial stage Products of Vaxcyte and its Affiliates (together with any other Services set forth in this CMSA). Lonza may not use the Suite to perform any work or service for itself, its Affiliates, or any Third Party without Vaxcyte's express prior written consent.

3.5 Preferred Supplier. Vaxcyte and its Affiliates shall have the right to establish and source from one or more alternative and backup supplier(s) of the Products and Lonza shall provide technology transfer assistance in accordance with Sections 5.1 and 13.8. Notwithstanding the foregoing, [***]. Vaxcyte shall [***] provide Lonza reasonable notice and a commercially reasonable period of time to mitigate the requirements it does not fulfill.

4. Project Management

4.1 Operational Flexibility. The intent of this CMSA is to provide, to the greatest extent possible, operational flexibility to Vaxcyte within the Suite after Hand Over as if the Suite was Vaxcyte's own manufacturing facility. In addition to other rights set forth in the CMSA, notwithstanding anything to the contrary in this CMSA, Vaxcyte shall have the right and authority to direct Lonza to (and upon Vaxcyte's direction, Lonza shall and shall cause its Affiliates to, except to the extent that compliance with Vaxcyte's directions under this Section 4.1 would constitute a breach of this CMSA (unless such breach is waived by Vaxcyte)) [***]. Vaxcyte shall be responsible for the direct impact, including regulatory consequences, of such directions/changes, as well as for any additional costs and expenses resulting from such changes calculated in accordance with the CMSA.

For clarity, Vaxcyte shall not direct Lonza, and Lonza shall not be obligated, to take any steps that violate or would result in violation of Applicable Laws. Lonza shall continue to be responsible for managing workforce for the Suite and quality control and quality assurance.

4.2 Governance Overview and Escalation.

4.2.1 Formation. The Parties shall, in accordance with this Section 4.2, establish (a) joint project teams (each, a "JPT") to oversee day-to-day compliance with particular activities under this CMSA and (b) a joint steering committee (the "JSC") to oversee the JPTs and ensure fulfillment of the intent of this CMSA and facilitate information sharing and resolution of disputes under this CMSA.

4.2.2 Escalation. In the event that a JPT cannot reach agreement on a particular issue within [***], either Party may refer the dispute to the JSC. In the event that the JSC cannot reach agreement on such issue within [***], either Party may refer the dispute to [***] other than in respect of matters expressly provided herein as being subject to Vaxcyte's sole decision-making authority, in which case, Vaxcyte's decision shall prevail in respect of such matters in the absence of agreement of the Parties. In the event that (i) [***] cannot reach agreement on such issue

within [***], or (ii) the Parties have otherwise not resolved such dispute within [***] since such dispute arose with the JPT, then the dispute resolution procedures set forth in in Section 4.5 shall apply and either Party may unilaterally submit such dispute to mediation in accordance with Section 4.5; provided, that for clarity, the Parties may mutually agree to submit such dispute to mediation in accordance with Section 4.5 at any time.

4.2.3 JPT and JSC Representatives. Each JPT and JSC established under this CMSA shall include [***] (the total number of representatives to be mutually and reasonably agreed by the Parties from time to time). Each Party may change its representatives on each JPT and the JSC at any time upon written notice to the other Party, and clarity, a particular individual may represent a Party on both a JPT and the JSC; provided that each Party shall ensure that it has appropriate representatives on the JSC to oversee the JPT (e.g., a Party's representatives on the JSC have senior authority compared to such Party's representatives on a JPT). Each of Lonza and Vaxcyte shall cause its representatives on each JPT and the JSC to cooperate in good faith with the representative of the other Party to fulfill the responsibilities of each JPT and the JSC. Meetings of each JPT and the JSC may be held in-person, by teleconference or by video conference, provided that all representatives participating in such meeting can communicate with each other simultaneously and instantly. Each JPT and the JSC may determine the number of representatives of each Party that must be present at each such meeting for a quorum (such number to include at least one representative of each Party).

4.3 Joint Project Teams. Each JPT shall meet [***] (or such other frequency agreed to by the Parties, and more often as is reasonably considered necessary at the request of any Party with reasonable notice to the other Party). Each JPT shall, with respect to projects and activities within the scope of responsibility of such JPT, (a) plan, coordinate and direct such projects and activities, (b) facilitate the exchange of information between the Parties with respect to such projects and activities, and (c) make applicable decisions with respect to such projects and activities (including as expressly required by this CMSA).

4.3.1 Joint Project Team for Pre-Commercial Services and Build-out. From the Effective Date until Hand Over, the Parties shall establish a JPT to oversee projects and activities related to (i) the Build-Out, and (ii) pre-commercial services and the preparation for operational ramp up and qualification, and applicable milestones for each, and to ensure timely completion thereof, in connection with this CMSA (including, for clarity, Sections 2.3 and 2.4).

4.3.2 Joint Project Team for Operations. The Parties shall establish a JPT to oversee projects and activities related to the manufacture of Product, the provisions of the Services and the general operations and maintenance of the Premises as it relates to Vaxcyte in accordance with this CMSA (including, for clarity, Sections 2.1 and 6).

4.4 Joint Steering Committee. From the Effective Date until the end of the Term, the Parties shall establish a JSC to oversee the JPTs and all projects and activities under this CMSA. The JSC shall meet [***], or as otherwise mutually agreed by the Parties (and more often as is reasonably necessary at the request of any Party with reasonable notice to the other Party, including to address and disputes escalated from a JPT). Without limiting the foregoing, (i) at either Party's request, Lonza and Vaxcyte shall review, at the JSC, Lonza's performance hereunder and any issues arising hereunder and to discuss and develop policies, practices, and procedures that may improve the quality and efficiency of the Services, and (ii) at least [***] during the Term, Lonza shall provide to Vaxcyte [***]. The JSC shall, with respect to all projects and activities within the scope of responsibility of the JSC and in furtherance of the responsibilities of the JPTs, (a) plan, coordinate and direct such projects and activities, (b) facilitate the exchange

of information between the Parties with respect to such projects and activities, and (c) make applicable decisions with respect to such projects and activities (including as expressly required by this CMSA). In addition, the JSC shall also be responsible to (x) discuss and seek resolution of issues around management of the Services, (y) agree and monitor deadlines and milestones for the Services, and (z) discuss and recommend any changes to the Services which shall take effect through written instruments signed by both Parties. All decisions of the JSC shall be reflected in the minutes taken at each meeting, and the responsibility for drafting such minutes shall alternate between the Parties; provided, however, meeting minutes will not have the effect of amending the terms of this CMSA. The Parties shall cooperate in good faith to resolve any disputes as to the content of the minutes.

4.5 Formal Dispute Resolution. In the event that (i) [***] cannot reach an agreement regarding a dispute within [***] in accordance with Section 4.2.2, or (ii) the Parties have otherwise not resolved such dispute within [***] since such dispute arose with the JPT in accordance with Section 4.2.2, either Party may submit such dispute to [***] prior to seeking other dispute resolution under this CMSA. For clarity, the Parties may mutually agree to submit any dispute to such mediation at any time. The Parties shall share the mediator fee and any filing fees equally. The mediation shall be held in the jurisdiction set forth in Section 24.2. The language during the mediation shall be English. If the Parties cannot resolve the dispute after attending mediation, during which the Parties [***] also attempt to resolve a dispute in accordance with Section 4.2.2, either Party may file a claim in accordance with Section 24.2. The language during the mediation shall be English.

5. Manufacturing

5.1 Technical Transfer to Suite. Lonza shall transfer the Manufacturing Process to the Suite, including implementing a technology transfer plan. Vaxcyte shall fully support such technology transfer as reasonably requested by Lonza. Vaxcyte shall (by such date as agreed between the Parties) supply to Lonza all such Vaxcyte Information, Vaxcyte Supplied Raw Materials (other than Agency Model Goods, which shall be subject to Appendix G), and other information or materials that may be reasonably required by Lonza to perform the Services and reasonably requested by Lonza in the technology transfer plan. Lonza shall not be responsible for any delays arising out of Vaxcyte's failure to provide such Vaxcyte Information, Vaxcyte Supplied Raw Materials (other than Agency Model Goods, which shall be subject to Appendix G), and/or other information and/or materials reasonably required and requested by Lonza to perform the Manufacturing Process transfer.

5.2 Engineering Batches. Lonza shall manufacture Engineering Batches in accordance with the master batch record. Vaxcyte shall have the right to make whatever further use of the non-cGMP Engineering Batches as it shall determine, provided that, such use is not for human use and does not violate any Applicable Laws. [***], Lonza will manufacture the Engineering Batches under cGMP conditions. Accordingly, if Lonza determines that an Engineering Batch does meet cGMP and the Specifications, it will release such Engineering Batch as a cGMP Batch.

5.3 PPQ Batches. Lonza shall manufacture and deliver PPQ Batches sufficient to document the operability and reproducibility of the Manufacturing Process and permit the Parties to complete and file the necessary regulatory documents.

5.3.1 Process Validation Plan. Prior to commencement of PPQ Batches, Lonza and Vaxcyte shall agree to a process validation plan identifying the validation requirements of the Manufacturing Process.

5.3.2 Regulatory Support. Any regulatory support activities (including pre-approval inspection) required and agreed to by Vaxcyte to support the approval of the Product from the Facility shall be performed and supported by Lonza as reasonably requested by Vaxcyte.

5.4 Batch Yield.

5.4.1 Target Yield Determination. After Lonza has successfully manufactured [***] Batches [***] of a PS or DS Product for a specific serotype without incurring substantial materials losses (collectively, the "Target Yield Determination Batches"), the target yield for such PS or DS Product shall be established by [***] (each, a "Target Yield"). Thereafter, Lonza will exercise commercially reasonable efforts to maintain an actual annual yield level for each PS or DS product by serotype (the "Actual Annual Yield") [***]. In the event that a statistically meaningful Target Yield cannot be readily established, Parties shall discuss in good faith a suitable path forward during a JSC meeting.

5.4.2 Variance Calculation. If the Actual Annual Yield falls [***] the respective Target Yield for the calendar year, then the shortfall for the calendar year (the "Annual Shortfall") will be calculated as follows: [***]. For clarity, materials subject to reimbursement shall include Vaxcyte Supplied Raw Materials, Lonza Manufactured Product Components and PS manufactured in the Suite.

5.4.3 Significant Losses. Notwithstanding anything to the contrary in this CMSA, Lonza will notify Vaxcyte of any substantial loss of materials within [***] after discovering the loss.

5.5 Productivity Efficiency Improvement. Lonza shall use commercially reasonable efforts to improve productivity in respect of the Services. Upon identification of an opportunity for improved productivity by either Party, a proposal will be submitted to the JPT for consideration. The Parties will mutually discuss any productivity efficiency improvement and possible financial impact prior to implementation. The decision to implement productivity efficiency improvements, including structure and timing, shall be at Vaxcyte's discretion, taking into consideration that such improvements are intended to be implemented after stable production has been established on a Product-by-Product basis. The Parties will jointly define the baseline [***] at the execution of this CMSA, which may be adjusted by the JSC, up or down, after stable production is established. If operations improve after stable production is established over the then-current baseline, the saving from efficiencies will be shared between Vaxcyte and Lonza as follows: [***]. The baseline will be revised accordingly for the upcoming year.

5.6 Person in Plant. The Suite is for Vaxcyte's exclusive use; therefore, Vaxcyte is permitted to have [***] of Vaxcyte (or Vaxcyte Affiliate) employees, designees or representatives being present in the Suite, including during Build-out. Vaxcyte shall be fully responsible for these employees, designees or representatives and such employees or representatives shall be subject to and agree to abide by confidentiality obligations to Third Parties and Lonza's generally applicable, customary and reasonable practices and operating procedures regarding (the number of) persons in the Suite of which Vaxcyte is notified in advance in writing, and such employees, designees and representative agree to comply with all reasonable instructions of Lonza's employees at the Premises and within the Suite relating to compliance with such practices and procedures. Lonza shall also provide, at no additional cost to Vaxcyte, adequate office space for [***] Vaxcyte (or Vaxcyte Affiliate) employees at the Facility ([***]). In addition, Lonza shall also provide adequate office space on the Premises for all Lonza employees who work at the Suite and Lonza will make commercially reasonable attempts to locate such additional office in the

closest proximity to the Suite. Vaxcyte's employees at the Premises shall be and remain employees of Vaxcyte, and Vaxcyte shall be solely responsible for the payment of compensation for such Vaxcyte employees (including, as applicable, all withholding, income and other payroll Taxes, workers' compensation insurance, health insurance, and other similar statutory and fringe benefits). Vaxcyte covenants and agrees to maintain workers' compensation benefits and employers' liability insurance as required by applicable laws or regulations with respect to any Vaxcyte employee at the Premises.

5.7 Manufacturing Waste. Lonza shall be solely responsible for the collection, storage, handling, transportation, and disposal of any and all waste, including any hazardous waste, created during performance of the Services in accordance with Applicable Laws. In the event there is a waste spill or threatened waste spill, including hazardous waste, Lonza will investigate, remediate and monitor such at Lonza's sole cost and expense.

6. Forecasting; Ordering; FTE Model

6.1 Forecasting. In order to plan for manufacturing, Vaxcyte will provide Lonza a written [***] Batch forecast by calendar quarter, updated on a [***] ("Batch Forecast"). Based on the Batch Forecast and taking into consideration the FTE baseline pursuant to Section 6.3, and with input and good faith discussions with Lonza, Vaxcyte will provide a [***] forecast by [***], updated [***], of the required FTEs to Lonza ("FTE Forecast"), which FTE Forecast must be reasonably intended to enable Lonza to meet the Batch Forecast; provided, that each such FTE Forecast must reflect at least [***] identified in Appendix E, Table E-1 (as such Table E-1 may be modified in good faith by the JSC). If Lonza has reasonable and good faith concerns that a FTE Forecast provided by Vaxcyte is materially insufficient to enable Lonza to meet the Batch Forecast, Lonza may submit the dispute to the applicable JPT (and any resulting escalation procedures pursuant to Section 4.2.2 shall apply). Vaxcyte may increase or decrease the then-current FTE Forecast by: (a) up to [***] upon at least [***] prior notice; and (b) over [***] upon at least [***] prior notice. Vaxcyte shall exercise best commercial efforts to avoid substantial swings in the FTE Forecast, not already outlined in Appendix H, in an effort to avoid excessive hiring and firing swings.

6.2 Ordering. The JPT shall meet on an as needed basis to discuss Product production scheduling. A Production Scheduling Form shall be submitted to plan for manufacturing to meet the Delivery Date. Vaxcyte may revise the Production Scheduling Form to accommodate its Product needs. For clarity, Vaxcyte shall be the final decision maker on all Product production scheduling and provided Lonza manufactures and delivers the Product as per the Production Scheduling Form, it shall not be responsible for stock-out situations.

6.3 FTE Baseline. The Parties have agreed the baseline FTE number after Hand Over is set forth in Appendix E, Tables E-1 and E-2 (as such Tables E-1 and E-2 may be modified in good faith by the JSC). At least every [***] the JPT and/or JSC will review the FTE baseline based upon the actual results of operations and expected productivity efficiency improvements and determine whether there should be any increases or decreases in the FTE baseline, with any such increase or decrease in the FTE baseline only to occur if there is a commercially reasonable, good faith basis for such change. FTE Fee structure and baselines are set forth in Appendix E.

7. Material Supply

7.1 Vaxcyte Information and Vaxcyte Supplied Raw Materials. Vaxcyte shall supply to Lonza all Vaxcyte Information and Vaxcyte Supplied Raw Materials (other than Agency Model Goods, which shall be subject to Appendix G) and other information that may be reasonably

required by Lonza to perform the Services. Lonza will not use the Vaxcyte Supplied Raw Materials or Vaxcyte Information (or any part thereof) for any purpose other than the performance of the Services under this CMSA. To the extent possible, Lonza shall segregate Vaxcyte Supplied Raw Materials and Lonza Manufactured Product Components from materials held for other customers. Lonza shall provide [***] reporting of cGMP inventory of Vaxcyte Supplied Raw Materials and Vaxcyte Products levels by SKU, with actual utilization/ending balances reconciled within [***] from the end of the [***].

7.2 Agency Model. The Parties acknowledge and agree that [***].

7.3 Buffer. The Parties acknowledge and agree that the terms and conditions set forth in Appendix F shall apply to the procurement, supply and use of Buffer under this CMSA.

8. Shipment; Delivery; Title; Risk of Loss; Storage; Packaging

8.1 Shipment. All Product shall be shipped [***] Lonza Facility (Incoterms 2020). Lonza shall include the following with each shipment of Product: (a) Vaxcyte's purchase order number; (b) the quantities of Product(s) included; and (c) all Release Documentation. Lonza shall package, mark, and transport the Product(s) for shipment in accordance with Vaxcyte's instructions, customary practices, and in compliance with Applicable Laws, Specifications, this CMSA, and the Quality Agreement. Lonza must make available released Product and samples within [***] of Vaxcyte's request. For clarity, Lonza shall ship partial Batch quantities from released Batches to Vaxcyte upon Vaxcyte's request.

8.2 Delivery. Each shipment of Product by Lonza shall include all Release Documentation.

8.3 Title Transfer and Risk of Loss. Title transfer and risk of loss for shall be handled as follows:

(a) Vaxcyte shall hold the title and risk of loss for all Vaxcyte Supplied Raw Materials and Lonza Manufactured Product Components (for clarity, until such Vaxcyte Supplied Raw Materials and Lonza Manufactured Product Components are utilized in the Manufacturing Process, at which time, for purposes of this Section 8.3, it shall become part of Product and be subject to Section 8.3(b)).

(b) Lonza shall hold the title and risk of loss for all Lonza Supplied Raw Materials and Product until (i) release to Vaxcyte (i.e., upon full release including complete Release Documentation) and (ii) the applicable Product is available to Vaxcyte for pickup.

8.4 Storage.

8.4.1 DS Storage. Lonza will store DS for [***] after full and final release of the Batch by Vaxcyte at no additional charge. In the exceptional event that Vaxcyte would require additional storage of DS Batches beyond [***], such storage will be subject to availability (including Third Party warehouses). Cost for storage beyond [***] will be charged to Vaxcyte as an Additional Service under Section 2.5 and shall be subject to (i) for up to [***], the risk of loss provisions (e.g., Section 8.4.3) set forth in this CMSA, and (ii) for any storage requested by Vaxcyte beyond such [***], the risk of loss provisions set forth in a separate bill and hold agreement (or other applicable agreement) to be mutually agreed-upon by the Parties.

8.4.2 Storage Other than DS. All other Batches (e.g., PS Batches) will be stored after release, at Lonza or a qualified Third Party warehouse selected by Lonza and agreed to by Vaxcyte, until such items are used for the manufacture of DS Batches or expiration. [***].

8.4.3 Storage Requirements. Lonza shall exercise best commercial efforts and customary due diligence and care to ensure that Vaxcyte Supplied Raw Materials, Lonza Manufactured Product Components, Product and other materials supplied and/or paid for by Vaxcyte are stored in accordance with this CMSA, the Specifications, cGMPs, the Quality Agreement, and Vaxcyte's instructions and protect these items from theft, casualty, or other damage within Lonza reasonable control. Notwithstanding the designated risk of loss in Section 8.3 and subject to Section 11.3, Lonza shall bear all risk of loss to the extent such loss is a result of Lonza's fraud, gross negligence, willful misconduct or breach of this Section 8.4. [***].

8.5 Packaging. All Product containers and packaging, including, but not limited to, shipment packaging, must be in compliance with this CMSA, the Quality Agreement and Specifications.

9. Product Acceptance/ Rejection

9.1 Inspection. Promptly following Lonza's full and final Batch release, Vaxcyte, or its designee, shall have the opportunity to inspect such Batches and shall have the right to test such Batches to determine compliance with Specifications, the Quality Agreement and/or GMP. Vaxcyte shall notify Lonza in writing of any Failed Batch within [***] of Batch release, after which time an unrejected Batch shall be deemed accepted. Vaxcyte shall inform Lonza in writing in case of concealed or latent defects which are not reasonably detectable upon visual inspection, including rejecting the Batch as a Failed Batch, promptly upon discovery of such defects but no later than [***] after initial discovery of the latent defect and in no event after [***] from Lonza Batch release.

9.2 Failed Batches. Vaxcyte may reject a Batch if the Batch does not meet or comply with the Specifications, cGMPs, the Quality Agreement or is not in accordance with this CMSA. In the event Lonza believes a Batch has been incorrectly rejected, Lonza may test a Batch sample and provide a report on the testing conditions and testing results for such Batch sample to Vaxcyte. In the event Lonza's test results show the Failed Batch meets Specifications, the Quality Agreement and GMP or there continues to be a dispute between the Parties over either (a) whether such Batch constituted a Failed Batch or (b) with respect to a Batch which the Parties agree is a Failed Batch, the extent to which such failure is attributable to a given Party, the Parties shall cause an independent laboratory to promptly review records, test data and perform comparative tests and/or analyses on samples of the Failed Batch. Such independent laboratory shall be mutually agreed upon by the Parties and shall be located in either the United States or the European Union. The independent laboratory's results shall be in writing and shall be final and binding save for manifest error. Unless otherwise agreed to by the Parties in writing, the costs associated with such testing and review shall be borne by the Party against whom the independent laboratory rules.

9.3 Remedy for Failed Batch. In the event of a Failed Batch due to Lonza's breach of its obligations in this CMSA, negligence or intentional misconduct, [***]. Lonza shall exercise best commercial efforts to immediately reprocess or replace a Failed Batch.

9.4 Security of Supply.

9.4.1 DS Availability. To ensure Vaxcyte's ability to supply DS for finished drug product manufacturing, Lonza must produce all Product (for example, [***]) based on the then-current Batch Forecast and Production Scheduling Form. In the event that Vaxcyte misses a scheduled drug product manufacturing slot due to the unavailability of the DS required for the drug product (including that no DS is available from Vaxcyte's safety stock of DS under Section 9.4.2), Lonza will issue a Credit Note to Vaxcyte in the amount of [***] for each finished drug product manufacturing slot not utilized by Vaxcyte, except to the extent that Vaxcyte's applicable FTE Forecast was not reasonably sufficient to enable Lonza to meet the applicable Batch Forecast; provided, that Lonza shall not be required to issue such a Credit Note of [***] to Vaxcyte more than [***], regardless of the number of scheduled drug product manufacturing slots that Vaxcyte misses during each such [***]. For clarity, in the event that Vaxcyte misses a drug product manufacturing slot in a [***], the Parties shall meet and mutually determine the next drug product manufacturing slot, taking into account that Lonza will use commercially best efforts to manufacture the DS required for the drug product manufacturing slot.

9.4.2 Vaxcyte Safety Stock. Vaxcyte shall have a commercially reasonable duty to mitigate DS unavailability risk by holding sufficient safety stock [***] of Vaxcyte's reasonably anticipated requirements of DS. Vaxcyte shall begin holding safety stock starting immediately after successful DS PPQ Batches are available and Facility regulatory approval by the FDA. Vaxcyte shall not be responsible for holding safety stock if such lack of safety stock is due to Lonza's inability to produce Product to supply or replenish the usable DS safety stock.

9.4.3 Lonza Mitigation. [***]. Lonza's payment obligation in Section 9.4.1 shall not go into effect until after successful manufacture and release of DS PPQ Batches.

10. Fees; Payment

10.1 Margin. The Parties acknowledge and agree that, where applicable in accordance with this CMSA, standard margin charged by Lonza is [***]. Notwithstanding the foregoing, after Hand Over standard [***] margin charged on FTEs, Suite Fee and subcontracting shall be adjusted to [***] on a pro rata basis with respect to [***] manufactured for and sold in Low-Cost Countries, provided, that Vaxcyte and its Affiliates source at least [***] manufactured in the Suite from Lonza. The amount subject to adjusted margin shall be calculated once a calendar year as follows: [***].

10.2 Construction and Operation of Suite During Build-out. Vaxcyte and Lonza shall contribute to Capital Expenditure costs for the Build-out of the Suite in accordance with Appendix C. Invoicing for Capital Expenditures shall be in accordance with Appendix C Section 7.

10.3 Pre-commercial Service Fee. As the sole fee and charge for the Suite prior to Hand Over, Vaxcyte shall pay Lonza a monthly pre-commercial service fee until Hand Over (as detailed in Appendix J) as follows (without the addition of any margin, and pro-rated for any partial months):

(a) In calendar year 2023, [***] starting on the Effective Date;

(b) In calendar year 2024, [***]; and

(c) In calendar year 2025 and thereafter until Hand Over, [***].

Lonza acknowledges and agrees that, prior to the Effective Date, Vaxcyte (i) has been invoiced by Lonza in the amount of [***], and (ii) will be invoiced by Lonza in the amount of [***] for

September 2023 and [***] for October 2023, in each case for certain pre-commercial services during the calendar year 2023, which such amounts, collectively, are hereby deemed accounted for (and shall be deducted from) the [***] in total pre-commercial service fees during 2023 pursuant to Appendix J.

10.4 Repurposing Fee. Vaxcyte shall pay Lonza a repurposing fee of CHF27,000,000 within thirty (30) days after the Effective Date which is intended for use in making the Suite available to lease to other Lonza clients following expiration or termination of this CMSA ("Repurposing Fee"). The Repurposing Fee shall be fully credited to (or, at Vaxcyte's request, paid back to) Vaxcyte on an annual, straight-line basis, starting on the first anniversary of the completion of PPQ Batches and ending on the tenth (10^{th}) anniversary thereof, subject to Section 18.4.2.

10.5 After Hand Over/Operations.

10.5.1 Suite Fees. The Suite Fee shall be calculated and paid by Vaxcyte to Lonza in accordance with Appendix D.

10.5.2 FTE Fees. FTE fees shall be calculated and paid by Vaxcyte to Lonza in accordance with Appendix E.

10.5.3 KPIs. Applicable bonuses and penalties with respect to operational and regulatory milestones are set forth in Appendix B. Vaxcyte, with input and in consultation with Lonza, shall objectively and in good faith recommend whether bonus and penalty milestones have been successfully met by the applicable deadline. Lonza may objectively and in good faith disagree with Vaxcyte's recommendation and utilize escalation procedures set forth in Section 4, including JSC and formal dispute resolution. The applicable bonus or penalty shall be invoiced or credited via a Credit Note within [***] after successful completion of the milestone or final resolution of the dispute with respect to same.

10.6 Inflation Adjustments.

10.6.1 Fee Review. Once a year, on or about January 1^{st}, [***], any payments due hereunder that are not based on [***], may be increased or decreased by either Party by an amount not to exceed [***]. For clarity, any payments due hereunder that are based on [***], shall not be subject to inflation or deflation adjustments hereunder.

10.6.2 FTE Fee Adjustment. FTE Fees are based on [***]. The FTE rate prior to true up may be reviewed in accordance with Section 10.6.1 but when calculating an increase from the previous FTE rate, the applicable margin will be removed before calculating the increase and reapplied after the adjustment. Salaries and benefits paid to FTEs (whether direct or indirect) shall be consistent with the general compensation philosophy and practices for other Lonza employees.

10.7 KPIs.

10.7.1 Drug Substance Commercial Manufacturing. Lonza shall exercise best commercial efforts to meet DS manufacturing in accordance with [***]. If Lonza [***] is equal to or exceeds [***] measured over a calendar year, Vaxcyte shall pay Lonza a lump sum bonus of [***]. In the event Lonza DS manufacturing [***] falls below [***], measured over any rolling three-month period that falls in the applicable calendar year, Lonza shall issue a Credit Note to Vaxcyte in the amount of [***] for each occurrence. The net amounts payable and creditable under this

Section 10.7.1 shall be calculated [***] and paid/credited via Credit Note within [***]. Lonza shall not be responsible for delays caused by Vaxcyte's failure to timely supply Vaxcyte Supplied Raw Materials (other than Agency Model Goods, which shall be subject to Appendix G) or timely order Lonza Supplied Raw Materials. Further, if at any point in the applicable calendar year, Lonza has paid or credited to Vaxcyte the penalty detailed in Section 9.4 (Security of Supply), Lonza will not be responsible for payment of the penalty stated in this Section 10.7.1.

10.7.2 Operational KPI. Lonza shall exercise best commercial efforts to meet operational performance KPIs set forth in Appendix A. In the event KPIs are not consistently met during the applicable period, Vaxcyte may utilize escalation procedures set forth in Section 4, including JSC.

10.8 Currency. All payments under this CMSA shall be made in Swiss Francs ("CHF").

10.9 Invoicing; Non-Duplication.

10.9.1 Invoicing. Lonza will invoice all fees on a monthly basis, except as otherwise specified in this CMSA. Invoices will be sent to [***] (or such other address as designated by Vaxcyte by notice to Lonza) and will be due [***] (except as otherwise specified in this CMSA) from receipt of an undisputed invoice and required backup documentation. For any pass-through costs, Lonza will provide Vaxcyte with an invoice and supporting documentation as needed for monthly invoices to ensure accurate records and to verify pass-through cost for Vaxcyte record keeping. Any undisputed invoice not paid within [***] after the due date shall accrue interest on any amount overdue at the lesser of (a) rate of [***] per month above the SOFR or (b) the maximum rate allowable by applicable law. Interest to accrue on a daily basis until full payment.

10.9.2 Non-Duplication. For avoidance of doubt and notwithstanding anything to the contrary contained in this CMSA, (a) it is not the intention of Lonza nor Vaxcyte to obligate Vaxcyte to make the same payment on account of any costs included in any of the fees, charges or other amounts payable by Vaxcyte hereunder more than once, and accordingly, if the provisions of this CMSA require any duplicative payments to be made by Vaxcyte to Lonza or any other persons or entities, then Vaxcyte shall only have the obligation to make such payment once and any duplicative payment shall be promptly refunded, and (b) Lonza shall not invoice Vaxcyte, and Vaxcyte shall not be responsible, for any such duplicative amounts (including, for clarity, that any costs incurred by Lonza, whether internal or external, shall only be allocated to a single amount owed by Vaxcyte). Lonza shall account for all internal and external costs relating to the Services or amounts due hereunder in a manner consistent with Lonza's verifiable and standard accounting practices and procedures, as generally applied by Lonza in the ordinary course of conducting its business. Lonza shall, without limitation to other provisions of this CMSA, allocate costs on a fair and equitable basis among all its customers and internally (and in a manner consistent with its verifiable and standard accounting and operating practices and procedures). Vaxcyte shall not be responsible for any costs that do not fairly and equitably relate to the Services provided to Vaxcyte hereunder.

10.10 Lonza Finance Designee. Lonza shall designate a finance person with appropriate authority at Lonza ("Lonza Finance Designee") to provide sufficient information and documentation as reasonably requested by Vaxcyte Finance to support Vaxcyte's accounting policies, procedures and reporting cycles. The Lonza Finance Designee will meet virtually with Vaxcyte finance [***] and at the same time, provide [***] accounting estimates ([***]). Within [***] of the [***], Lonza Finance will provide actual [***] accounting reports and supporting documentation as needed, as well as be available to answer questions.

10.11 Financial Audit. Each Party shall maintain its financial and operational books and records related to the Services, [***] and, Lonza shall also maintain such books and records as it relates to costs included in the Suite Fee and the cost of the Build-out, each in accordance with its usual business practices for a period of at least [***] from the creation of such books and records. Either Party may conduct a financial and operational audit of the other Party to confirm such Party's compliance with financial terms of this CMSA upon [***] written notice and not more often than [***]. The audit will be conducted by an independent Third Party selected by the Party initiating the audit and at such Party's expense. In the event the audit reveals any net variance between amounts charged and amounts that should have been charged pursuant to the terms of this CMSA, such net overcharges/undercharges *plus* interest rate charges calculated pursuant to Section 10.9 shall be paid by wire transfer to the relevant Party within [***] of final determination. If such audit reveals more than a [***] net overcharges or a net overcharged in excess of [***] to the detriment of the auditing Party, then expenses for said auditor shall be reimbursed by the audited Party to the auditing Party up to a cap of [***].

10.12 Third Party Confidential Information. Where certain information cannot be shared directly with Vaxcyte due to Lonza confidentiality obligations with Third Parties, a third-party auditor or accountants can be appointed by Vaxcyte. The costs for such auditor or accountants shall be borne by Vaxcyte, subject to Section 10.11.

10.13 Taxes. Unless otherwise indicated in writing by Lonza, all Prices and charges are exclusive of value added tax (VAT) and of any other applicable sales, use, services and similar Taxes and fees of whatever nature imposed by or under the authority of any government or public authority and all such charges applicable to the Services shall be paid by Customer, subject to receipt of a valid invoice issued in accordance with Applicable Laws. All payments pursuant to this CMSA shall be subject to deduction and withholding of Taxes to the extent required by Applicable Laws. To the extent such amounts are so deducted and withheld, such amounts shall be treated for all purposes under this CMSA as having been paid to the person in respect of which such deduction and withholding was made. Each Party will provide the other with reasonable assistance to enable the recovery, as permitted by Applicable Laws, of withholding Taxes, Value Added Taxes (VAT), or similar obligations resulting from payments made under this CMSA, this recovery to be for the benefit of the Party bearing the applicable Tax. Upon Vaxcyte's reasonable request, Lonza will provide reasonable administrative VAT support with respect to these activities. Any such support provided by Lonza shall not be deemed tax or legal advice. For the avoidance of doubt, each Party shall be responsible for the payment of all income and other Taxes (including interest) imposed on its own income arising under this CMSA.

10.14 Records Retention. Lonza shall maintain (and shall cause its Affiliates and permitted subcontractors to keep) complete, true and accurate books and records, including, financial records and other records or documentation (collectively "Documentation") generated by Lonza and such Affiliates and third parties in connection with this CMSA, in sufficient detail with respect to the payments due and costs incurred under this CMSA (and in a manner that enables Vaxcyte or its auditor to verify and calculate amounts due hereunder), with respect to each item of Documentation for the longer of (i) [***] from the date such item of Documentation was created, and (ii) the period of time required by Applicable Law. Lonza shall not, and shall ensure its Affiliates and permitted subcontractors do not, destroy or dispose of any Documentation prior to the end of the applicable retention period under the preceding sentence, and upon Vaxcyte's request, Lonza shall provide (and shall ensure its Affiliates and permitted subcontractors provide) such records to Vaxcyte.

10.15 [***]

11. Insurance

11.1 Both Parties. Each Party shall during the Term and, if coverage is on a claims made basis, for [***] after the Term, obtain and maintain at its own cost and expense from an insurance company (or companies), with an AM Best financial strength rating of not less than "A-" (the "Required Rating"), the following insurance: (a) commercial general liability insurance including, but not limited to product liability and completed operations coverage in the amount of at least [***] (or an equivalent amount in another currency) per claim or occurrence and in the annual aggregate; and (b) an appropriate level of insurance for any equipment each such Party owns. Each Party shall provide the respective other Party with a certificate of such insurance upon reasonable request.

11.2 Lonza. Lonza shall obtain and maintain, at its own cost and expense from an insurance company (or companies) with the Required Rating, (a) all-risk property and cargo insurance to cover the Facility and the Suite (including Existing Equipment but excluding the Vaxcyte owned equipment), Lonza Supplied Raw Materials, intermediates, transportation, storage of property, damage and Products before final release, (b) construction and erection all-risk insurance (also known as "builders-risk") during the performance of the Build-out to cover the Facility and the Suite, excluding the Vaxcyte owned equipment contained therein, in, each case, in an amount equal to [***] of the full replacement value thereof, (c) cyber insurance including, but not limited to security and privacy liability coverage in the amount of at least [***] (or an equivalent amount in another currency) per claim and in the annual aggregate; (d) workers' compensation and employers' liability insurance (or the Swiss equivalent thereof) as required by Applicable Law for all Lonza employees or its Affiliates at the Premises, (e) any insurance required by local authorities, and (f) any other insurance agreed between the Parties. The words "full replacement value," as used above, shall mean the cost of actual replacement (excluding foundation and excavation costs and cost of underground flues, pipes or drains).

11.3 Vaxcyte. Vaxcyte shall obtain and maintain, at its own cost and expense from an insurance company (or companies) with the Required Rating (a) all-risk property and cargo insurance to cover Vaxcyte owned equipment, Vaxcyte Supplied Raw Materials, intermediates, Agency Model Goods (other than Agency Model Goods procured by Lonza subject to Appendix G) and Products after final release pursuant to this CMSA when controlled by or stored at Lonza or a Third Party storage facility engaged by Lonza, (b) cyber insurance including, but not limited to security and privacy liability coverage in the amount of at least [***] (or an equivalent amount in another currency) per claim and in the annual aggregate; (c) workers' compensation and employers' liability insurance (or the Swiss equivalent thereof) as required by Applicable Law for all Vaxcyte employees or its Affiliates at the Premises; and (d) any other insurance agreed between the Parties. In the event of a claim by Vaxcyte under all-risk or cargo insurance policy referenced in Section 11.3(a) for the loss of Raw Materials, intermediates, or Products, Lonza shall cover [***] of the deductible(s) under such insurance policy (or policies) up to [***] per claim.

11.4. Miscellaneous Insurance Requirements.

11.4.1 The insurance policies required to be maintained hereunder shall provide that they are primary to and non-contributory with any other insurance (including primary, umbrella and/or excess insurance and any self-insurance programs afforded to or maintained by any Party or its Affiliates). Notwithstanding anything to the contrary in this CMSA, the obligations of the Parties under this CMSA shall not in any way be affected by the absence or presence in any case of

insurance coverage or by the failure or refusal of any insurance carrier to perform any obligation under any insurance policy.

11.4.2 During any period in which insurance is required to be maintained hereunder, the Party required to maintain such insurance shall use commercially reasonable efforts not to permit such insurance to be reduced, expired or canceled.

11.4.3 [***]

12. QUALITY AND REGULATORY

12.1 QUALITY AGREEMENT. Within [***] after the Hand Over, the Parties shall negotiate in good faith and enter into a Quality Agreement. If there is a conflict between the terms and conditions of this CMSA and the Quality Agreement, the terms and conditions of the Quality Agreement shall prevail with respect to quality matters and this CMSA shall prevail with respect to all other matters. If the Quality Agreement is not in place within [***] after Hand Over, Lonza and Vaxcyte commit to enter into the Quality Agreement in a timely manner, but in no event later than the commencement of cGMP manufacturing.

12.2 QUALITY TESTS AND CHECKS. All in-process and Product tests or checks will be performed in accordance with the Quality Agreement and Appendix K hereto. If Product is found to not be in compliance, Lonza shall, at its own expense, handle, store, transport, treat, and dispose of such Product according to all Applicable Laws.

12.3 REGULATORY DOCUMENTATION AND COMMUNICATIONS. All regulatory documentation, and communications with Regulatory Authorities, will be handled in accordance with the Quality Agreement. Lonza shall maintain all appropriate licenses and permits to lawfully operate its Facility and the Suite for the purposes contemplated herein for as long as Vaxcyte holds inventory of finished products containing the Product. Lonza shall promptly notify Vaxcyte if Lonza becomes aware of any pending or threatened litigation, governmental investigation, proceeding or action involving the Product or the Facility.

12.5 REGULATORY FILINGS. Lonza shall, upon Vaxcyte's reasonable request from time to time and at Vaxcyte's expense, assist Vaxcyte, its Affiliates and/or their customers, in connection with any submission to any Regulatory Authorities, including, without limitation, an application for the regulatory approval relating to finished products incorporating the Product. Such assistance shall include, without limitation, responding to queries from, and providing required additional information to, the Regulatory Authorities and/or Vaxcyte, and permitting the Regulatory Authorities and/or Vaxcyte and/or one or more of its Affiliates (or designees) to conduct inspections of and audits at the Premises, as required. The specific scope and costs of such assistance shall be agreed upon between the Parties in a Service Schedule. [***]. Lonza and Vaxcyte acknowledge and agree that there is a joint responsibility among the Parties to present findings to support this approach in conversations with the Regulatory Authorities. Specifically, when requested by Vaxcyte, Lonza will provide data and evidence to support regulatory filings for the above approach at cost to Vaxcyte. Should a Regulatory Authority make a determination regarding [***] that either Party expects will materially impact the timeline, the Parties will resolve the impact to the timeline, if any, as provided in Section 4.2.2 of the CMSA.

12.6 REGULATORY INSPECTIONS. Provisions regarding inspections by Regulatory Authorities and audits shall be set out in the Quality Agreement, which shall provide Vaxcyte (and its designees) with full operational and quality audit access to the Suite and, to the extent used in

connection with this CMSA, other areas of the Facility and the Premises, in accordance with the terms of the Quality Agreement.

12.7 RECALLS.

12.7.1 Recall Process. Lonza shall maintain records necessary to permit a recall of any product containing Product and Products supplied to or on behalf of Vaxcyte. Each Party will promptly notify the other Party within [***] of discovery of information related to the Product that it believes could pose a potential significant health hazard or non-compliance with applicable government regulations or the Quality Agreement, or that otherwise indicates that a recall may be necessary or advisable. Lonza shall notify Vaxcyte within [***] of receiving information that reasonably suggests a Product has caused or contributed to a death or serious injury, as defined in applicable FDA or other Regulatory Authority regulations. Without limiting the foregoing, in the event any Regulatory Authority issues a request, directive or order that any Product, or product containing Product, be recalled, or in the event that either Party reasonably believes that any product incorporating Product should be recalled, each Party shall cooperate in any investigations surrounding the recall and take appropriate corrective actions. In the event of a Product recall or a product incorporating Product recall, Lonza shall exercise best commercial efforts to replace the recalled Product with conforming Product. In the event that after good faith investigation (subject to independent laboratory review following process outlined in Section 9.2 of this CMSA) it is determined or agreed by the Parties that Lonza's actions are the "root cause" of the recall, [***].

12.7.2 Regulatory Authority Reports. Vaxcyte shall have sole and final decision-making authority with respect to, and control over, any recall or safety alert activities, and the initiation thereof, and preparing and submitting any necessary reports to Regulatory Authorities with respect to any Product or finished product incorporating Product that has been recalled. Lonza shall provide all necessary documentation and information to Vaxcyte and will collaborate and cooperate with Vaxcyte, as needed, in a recall of the defective Product Batch.

12.8 PRODUCT SAMPLES/RETAINS. Lonza will store Product samples/retains in accordance with the Quality Agreement.

13. INTELLECTUAL PROPERTY

13.1 BACKGROUND INTELLECTUAL PROPERTY. Neither Party will, as a result of this CMSA, acquire any right, title, or interest in, to or under any Background Intellectual Property of the other Party or any of its Affiliates.

13.2 VAXCYTE OWNERSHIP. Subject to Section 13.3, Vaxcyte shall own all right, title, and interest in and to [***] (the "New Vaxcyte Intellectual Property"). [***].

13.3 LONZA OWNERSHIP. Notwithstanding Section 13.2, and subject to the license granted in Section 13.5, Lonza shall own all right, title and interest in [***] (the "New General Application Intellectual Property"). [***].

13.4 INTELLECTUAL PROPERTY ASSIGNMENT. Lonza hereby assigns, and shall cause its External Laboratories or other contractors (including subcontractors) or agents and their personnel involved in the performance of the Services to assign, to Vaxcyte all of its and their right, title and interest in any New Vaxcyte Intellectual Property. Lonza shall execute, and shall require its personnel as well as its Affiliates, External Laboratories or other contractors or agents and their

personnel involved in the performance of the Services to execute, any documents reasonably required to confirm Vaxcyte's ownership of the New Vaxcyte Intellectual Property, and any documents required to apply for, maintain and enforce any patent or other right in the New Vaxcyte Intellectual Property. To the extent that Vaxcyte has or obtains any rights, title or interest in New General Application Intellectual Property, Vaxcyte hereby assigns to Lonza all of its right, title and interest in any New General Application Intellectual Property. Vaxcyte shall execute, and shall require its personnel as well as its Affiliates, or other contractors or agents and their personnel involved in the performance of the Services to execute, any documents reasonably required to confirm Lonza's ownership of the New General Application Intellectual Property, and any documents required to apply for, maintain and enforce any patent or other right in the New General Application Intellectual Property.

13.5 Licenses to Vaxcyte. Lonza hereby grants to Vaxcyte a non-exclusive, worldwide, perpetual, irrevocable, fully paid-up, royalty free, transferable license, [***], under the New General Application Intellectual Property, Lonza Background Intellectual Property and Lonza Information, to use, sell, offer for sale, import, export, distribute (including through multiple tiers of distribution), and otherwise exploit and commercialize such Products or products incorporating Products (or substantial equivalents or variations thereof or improvements thereto). Lonza hereby grants to Vaxcyte a non-exclusive, worldwide, fully paid-up and royalty free ([***] pursuant to Section 13.8, and subject to Section 13.7), perpetual, irrevocable, transferable license, including the right to grant sublicenses through multiple tiers, under the New General Application Intellectual Property, the Lonza Background Intellectual Property and Lonza Information to the extent incorporated into or used by Lonza in the manufacturing process for, or otherwise necessary to make or have made, Products or products incorporating Products (or substantial equivalents or variations thereof or improvements thereto), including, for clarity, the right to use, make, have made, sell, offer for sale, import, export, distribute (including through multiple tiers of distribution), and otherwise exploit and commercialize the same. For clarity, the license to Vaxcyte to Lonza Background Intellectual Property and Lonza Information used in the manufacturing process shall exclude any and all Lonza operating documents and standard operating procedures (SOPs) that are generally applicable to Lonza's business operations and not specifically related to Product or the manufacture of Product, solely to the extent the same is not incorporated into or otherwise necessary to make or have made Products or products incorporating Products (or substantial equivalents or variations thereof or improvements thereto).

13.6 License to Lonza. Vaxcyte hereby grants Lonza and its Affiliates, subcontractors and the External Laboratories the non-exclusive right to use the Vaxcyte Information, Vaxcyte Background Intellectual Property, Vaxcyte Supplied Raw Materials (to the extent they are proprietary to Vaxcyte), New Vaxcyte Intellectual Property and any and all other Intellectual Property of Vaxcyte or its Affiliates supplied by or on behalf of Vaxcyte to Lonza, in each case, solely during the Term and to the extent necessary for, and solely for the purpose of, fulfilling their obligations under this CMSA, for the benefit of Vaxcyte (and not on behalf of or for the separate benefit of itself, its Affiliates or any Third Party).

13.7 Vaxcyte Manufacturing Process. Lonza shall not incorporate any Lonza Information, Lonza Background Intellectual Property or New General Application Intellectual Property, or any Intellectual Property of any Third Party that Lonza does not control, into the Manufacturing Process (including by making any modifications or improvements of the Vaxcyte Manufacturing Process) or the process used by Lonza for manufacturing the Products, without the express written consent of Vaxcyte. To the extent that Lonza incorporates any Lonza Information, Lonza Background Intellectual Property or New General Application Intellectual Property into the

Manufacturing Process (or the process used by Lonza for manufacturing the Products) without the express written consent of Vaxcyte, [***].

13.8 Transfer of Commercial Manufacturing Process. Vaxcyte shall have the right to transfer the Commercial Manufacturing Process to itself, its Affiliates and/or any Third Party for the manufacture of Product (but no other products). [***]. Vaxcyte shall reimburse Lonza for any costs incurred in performing such requested technology transfer as Additional Services in accordance with Section 2.5. In the event Vaxcyte seeks to transfer the Commercial Manufacturing Process to a designated Third Party for the purpose of making a Product that is or was manufactured by Lonza under this CMSA or products incorporating such Products (or substantial equivalents or variations thereof or improvement thereto), Vaxcyte will provide Lonza prior notice of such technology transfer of the Commercial Manufacturing Process including the legal name of the entity to where such Commercial Manufacturing Process is proposed to be transferred. For the avoidance of doubt, in respect of any technology transfer of the Commercial Manufacturing Process to Vaxcyte or a Third Party pursuant to this Section 13.8, Lonza shall not have any liability to Vaxcyte or such Third Party for any and all uses of the Lonza Information, Lonza Background Intellectual Property and New General Application Intellectual Property by Vaxcyte or such Third Party in the manufacture by Vaxcyte or such Third Party of Product (or products containing Products (or substantial equivalents or variations thereof or improvement thereto)). [***].

13.9 Prosecution of Patents.

13.9.1 Vaxcyte. Subject to Section 13.9.2, Vaxcyte will have the sole right and discretion to file (or not file), prosecute and maintain patent applications and patents claiming the New Vaxcyte Intellectual Property, [***]. Lonza will cooperate with Vaxcyte, at Vaxcyte's expense, to file, prosecute, maintain, defend, and enforce patent applications and patents claiming any New Vaxcyte Intellectual Property.

13.9.2 Application Review. Unless the Parties agree otherwise, at least [***] prior to filing any patent application disclosing or claiming any [***].

13.9.3 Lonza. Lonza will have the sole right and discretion to file (or not file), prosecute and maintain patent applications and patents [***].

13.10 Letter Agreement. Notwithstanding anything to the contrary in this CMSA, the Parties have agreed on the terms and conditions pertaining to certain Intellectual Property generated prior to the Effective Date as set forth in the Letter Agreement, referred to as "Lonza New Inventions" and "Vaxcyte New Inventions" in the Letter Agreement, and that to the extent the terms and conditions of Sections 13.2 and 13.3 of this CMSA, with respect to definitions of New General Application IP and New Vaxcyte IP, are interpreted to be inconsistent with to the definitions of "Lonza New Inventions" and/or "Vaxcyte New Inventions" (each as defined in the Letter Agreement), then the definitions in the Letter Agreement shall control in determining ownership of new Intellectual Property under this CMSA. The Parties acknowledge and agree that nothing in the Letter Agreement shall be construed as limiting, in any manner, the licenses granted to Vaxcyte under Section 13.5 hereof.

14. Covenants, Representations and Warranties

14.1 Lonza. Lonza hereby covenants, represents and warrants to Vaxcyte that:

(a) the Services, and Build-out shall be performed in accordance with all Applicable Laws and in a workman-like and professional manner and otherwise in accordance with this CMSA and relevant industry standards, with all permits and approvals of any Regulatory Authority in place therefor;

(b) Lonza has, and will at all times throughout the Term have, the requisite expertise, experience and skill to perform its obligations hereunder;

(c) Lonza shall supply the Product and manufacture, package, ship and store the Product in accordance with Applicable Laws, the Specifications, the Quality Agreement, Vaxcyte instructions and this CMSA;

(d) [***];

(e) [***];

(f) the Product will be delivered to Vaxcyte free and clear of all security interest, liens or other encumbrances of any kind or character imposed by or on account of Lonza or any Third Party;

(g) Lonza holds (and shall until the expiry of each product containing Product obtain and maintain) all necessary permits, approvals, consents, and licenses (or other regulatory approvals) to enable it to perform the Services at the Premises, Facility and Suite (and perform any other work performed or required to be performed hereunder) and to operate the Facility;

(h) Lonza Background Intellectual Property, Lonza Information, New General Application Intellectual Property and Third Party Intellectual Property (and the use and receipt thereof in accordance with this CMSA), independent of any combination with Product, Vaxcyte Supplied Raw Materials, Vaxcyte Information and/or Vaxcyte Background Intellectual Property (and to Lonza's knowledge, in combination with any of the foregoing), shall not infringe any Intellectual Property rights of a Third Party, and Lonza otherwise has the requisite Intellectual Property rights (i) in its equipment, Facilities, or other materials or Intellectual Party provided or introduced into the Services or Manufacturing Process or Product by Lonza or its Affiliates, and (ii) to perform its obligations under this CMSA (for clarity, without making any warranty regarding rights in or to Vaxcyte Information, Vaxcyte Background Intellectual Property or New Vaxcyte Intellectual Property or the use thereof), in each case, without infringing the Intellectual Property rights of any Third Party;

(i) Lonza will promptly notify Vaxcyte in writing if it receives or is notified of a formal written claim from a Third Party that Lonza Background Intellectual Property, Lonza Information, or New General Application Intellectual Property (or the use and receipt thereof in accordance with this CMSA) that is being used or provided in connection with the Services or Manufacturing Process or Product infringes any Intellectual Property or other rights of that Third Party;

(j) Lonza is not aware of any circumstances that would be reasonably likely to result in the results engineering concept study or other estimates of cost hereunder being materially inaccurate;

(k) Lonza shall provide the construction warranty and latent defect protection as provided in Appendix C;

(l) neither Lonza nor its representatives performing Services under this CMSA shall use any person or entity who (i) is excluded from or debarred under any healthcare program, including, but not limited to, the U.S. Office of Inspector General from a federally funded healthcare program under 42 U.S.C § 1320a-7 or debarred by the FDA under FDCA 21 U.S.C. § 306(a)(2) or 21 CFR part 312; (ii) is under investigation by the FDA for debarment or is otherwise disqualified or suspended from or subject to restrictions in providing services in any capacity to any entity that has an approved or pending drug product application; and (iii) appears in the list of excluded individuals/entities as published by the Department of Health and Human Services (DHHS) Office of the Inspector General (OIG List), nor in the list of debarred contractors as published in the System for Award Management by the General Services Administration (GSA List); and

(m) Lonza shall notify Vaxcyte immediately if Section 14.1(l) becomes untrue, or if Lonza is notified by an enforcement agencies that an investigation has begun which could lead to such sanction, debarment, suspension, or conviction.

14.2 VAXCYTE. Vaxcyte hereby covenants, represents and warrants to Lonza that:

(a) Vaxcyte has the requisite rights in the Product, Vaxcyte Supplied Raw Materials, Vaxcyte Information, Vaxcyte Background Intellectual Property and New Vaxcyte Intellectual Property rights necessary to permit Lonza to perform the Services in accordance with this CMSA without infringing the Intellectual Property rights of any Third Party and the receipt and/or use of Vaxcyte Supplied Raw Materials, Vaxcyte Information, Vaxcyte Background Intellectual Property and New Vaxcyte Intellectual Property in the performance of the Services in accordance with this CMSA shall not infringe any Intellectual Property rights of a Third Party; and

(b) Vaxcyte will promptly notify Lonza in writing if it receives or is notified of a formal written claim from a Third Party that Vaxcyte Information, Vaxcyte Background Intellectual Property and/or Vaxcyte Intellectual Property that is being use by Lonza thereof for the provision of the Services infringes any Intellectual Property or other rights of that Third Party.

14.3 MUTUAL. Each Party hereby covenants, represents and warrants that:

(a) it has the necessary corporate authorizations to enter into and perform this CMSA;

(b) neither it, nor any of its directors, officers, agents, or employees acting on behalf of it, has taken any action that will cause the other Party or their Affiliates to be in breach of any Applicable Laws for the prevention of fraud, bribery, corruption, racketeering, money laundering or terrorism, including, but not limited to, U.S. Foreign Corrupt Practices Act, nor has it, in connection with the conduct of its business activities, promised, authorized, ratified or offered to make, or taken any act in furtherance of any payment, contribution, gift, reimbursement or other transfer of anything of value, or any solicitation, directly or indirectly (i) to any individual including government officials, (ii) to an intermediary for payment to any individual including government officials, or (iii) to any political party for the purpose or effect of public or commercial bribery, acceptance of or acquiescence in extortion, kickbacks or other unlawful, illegal or improper means; and

(c) entering into this CMSA is not a violation of any of its contractual or other legal obligations to Third Parties.

14.4 DISCLAIMER. THE WARRANTIES EXPRESSLY SET FORTH IN THIS CMSA ARE IN LIEU OF ALL OTHER WARRANTIES, AND ALL OTHER WARRANTIES, BOTH EXPRESS AND IMPLIED, ARE EXPRESSLY DISCLAIMED, INCLUDING WITHOUT LIMITATION ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

15. Indemnification and Liability

15.1 Indemnification by Lonza. Lonza shall indemnify, defend and hold harmless Vaxcyte, its Affiliates, and their respective officers, employees and agents ("Vaxcyte Indemnitees") from and against any loss, damage, liability, costs and expenses (including reasonable attorneys' fees and disbursements) ("Loss") that Vaxcyte Indemnitees may suffer as a result of any actual or threatened suit, claim or action by a Third Party ("Claim") arising directly out of [***]. Notwithstanding the foregoing, Lonza shall have no obligations under the foregoing clause (f) for any liabilities, expenses, or costs to the extent arising out of or relating to claims covered under Section 15.2, or, except as provided in Section 15.2(e), for Taxes other than any Taxes that respect claims, losses, liabilities costs and expenses arising from any non-Tax claim.

15.2 Indemnification by Vaxcyte. Vaxcyte shall indemnify, defend and hold harmless Lonza, its Affiliates, and their respective officers, employees and agents ("Lonza Indemnitees") from and against any Loss that Lonza Indemnitees may suffer as a result of any actual or threatened Third Party Claim arising directly out of [***]. Notwithstanding the foregoing, Vaxcyte shall have no obligations under the foregoing clause (e) for any liabilities, expenses, or costs to the extent arising out of or relating to claims covered under Section 15.1 or, except as provided in Section 15.1(f), for Taxes other than any Taxes that represent claims, losses, liabilities, costs and expenses arising from any non-Tax claim.

15.3 Indemnification Procedure. If the Party to be indemnified intends to claim indemnification under Section 15, [***].

15.4 DISCLAIMER OF CONSEQUENTIAL DAMAGES. IN NO EVENT SHALL EITHER PARTY BE LIABLE TO THE OTHER PARTY FOR INCIDENTAL, INDIRECT, SPECIAL, PUNITIVE OR CONSEQUENTIAL DAMAGES, LOST PROFITS OR LOST REVENUES ARISING FROM OR RELATED TO THIS CMSA, EXCEPT TO THE EXTENT RESULTING FROM FRAUD, GROSS NEGLIGENCE OR INTENTIONAL MISCONDUCT, DEATH OR PERSONAL INJURY AND/OR FOR EITHER PARTY'S BREACH OF SECTION 16 HEREOF.

15.5 LIMITATION OF LIABILITY. [***].

16. Confidentiality

16.1 Confidential Information. A Party receiving Confidential Information (the "Receiving Party") agrees to strictly keep secret any and all Confidential Information received during the Term from or on behalf of the other Party (the "Disclosing Party") using at least the same level of measures as it uses to protect its own Confidential Information, but, in any case, at least commercially reasonable and customary efforts. Confidential Information shall include information disclosed in any form including, but not limited to, in writing, orally, graphically or in electronic or other form to the Receiving Party, observed by the Receiving Party or its employees, agents, consultants, or representatives, or otherwise learned by the Receiving Party under this CMSA, which the Receiving Party knows or reasonably should know is confidential.

16.2 Permitted Disclosures. Notwithstanding the foregoing, Receiving Party may disclose to any courts and/or other authorities Confidential Information which is or will be required pursuant to applicable governmental or administrative or public law, rule, regulation, or order. In such case the Party that received the Confidential Information will, to the extent legally permitted, inform the other Party promptly in writing and cooperate with the Disclosing Party in seeking to minimize the extent of Confidential Information which is required to be disclosed to the courts and/or authorities.

16.3. Exceptions. The obligation to maintain confidentiality under this CMSA does not apply to Confidential Information, which:

(a) at the time of disclosure was publicly available; or

(b) is or becomes publicly available other than as a result of a breach of this CMSA by the Receiving Party; or

(c) the Receiving Party can establish by competent evidence, was rightfully in its possession at the time of disclosure by the Disclosing Party and had not been received from or on behalf of Disclosing Party; or

(d) is supplied to a Party by a Third Party which was not in breach of an obligation of confidentiality to Disclosing Party or any other party; or

(e) is developed by the Receiving Party independently from and without use of the Confidential Information, as evidenced by contemporaneous written records.

16.4 Use. The Receiving Party will use Confidential Information only for the purposes of this CMSA (including the exercise of any licenses or rights hereunder and performance of any technology transfer provided for under this CMSA) and will not make any use of the Confidential Information for its own separate benefit or the benefit of any Third Party (other than to exercise any licenses or rights hereunder) including, without limitation, with respect to research or product development or any reverse engineering or similar testing. The Receiving Party agrees to return or destroy promptly (and certify such destruction) on Disclosing Party's request all written or tangible Confidential Information of the Disclosing Party, except that one copy of such Confidential Information may be kept by the Receiving Party in its confidential files for record keeping purposes only.

16.5 Restrictions. Each Party will restrict the disclosure of Confidential Information to such officers, employees, professional advisers, finance-providers, consultants and representatives of itself and its Affiliates who have been informed of the confidential nature of the Confidential Information and who have a need to know such Confidential Information for the purpose of this CMSA or an applicable financing or acquisition. Both Parties may disclose Confidential Information of the other Party and its Affiliates to potential and actual acquirers provided such disclosure is limited to the terms of this CMSA. Vaxcyte also may disclose to its potential and actual: (a) acquirers and (b) bona fide collaborators in the research, development, manufacture, sale, marketing, promotion, distribution or and commercialization of the Products (or products containing the Products or substantial equivalents or variations thereof or improvements thereto), the work product or other Confidential Information (including this CMSA) provided to Vaxcyte or its Affiliates by Lonza or its Affiliates as a consequence of the provision of the Services. Prior to disclosure to such persons or entities it shall bind its and its Affiliates' officers, employees, consultants and representatives that will receive any Confidential Information to confidentiality and non-use obligations no less stringent than those set forth herein. The Receiving Party shall

notify the Disclosing Party as promptly as practicable of any unauthorized use or disclosure of the Confidential Information.

16.6 Breach Responsibility. The Receiving Party shall at any time be fully liable for any and all breaches of the confidentiality obligations in Section 16 by any of its Affiliates or the employees, consultants, potential and actual acquirers, and representatives of itself or its Affiliates.

16.7 Relief. Each Party hereto expressly agrees that any breach or threatened breach of the undertakings of confidentiality provided under Section 16 by a Party may cause irreparable harm to the other Party and that money damages may not provide a sufficient remedy to the non-breaching Party for any breach or threatened breach. In the event of any breach and/or threatened breach, then, in addition to all other remedies available at law or in equity, the non-breaching Party shall be entitled to seek injunctive relief and any other relief deemed appropriate by the non-breaching Party.

17. Term.

The initial term of this CMSA shall commence on the Effective Date and shall end on December 31, 2038 (the "Initial Term"). Thereafter, this CMSA shall automatically renew for up to three (3) additional renewal terms of five (5) years each (for clarity, up to a total of additional fifteen (15) years) ("Renewal Term"), unless Vaxcyte notifies Lonza that it does not wish to renew the CMSA at least twenty four (24) months prior to the end of the then current Initial Term or Renewal Term or the CMSA is terminated earlier as provided herein (the "Term"). The Parties shall, at least [***] prior to the end of the Initial Term and [***] prior to the end of each Renewal Term, meet and discuss in good faith whether any terms of this CMSA should be amended (but, for clarity, in the absence of any such amendment agreed in writing by the Parties, the then current terms and conditions of this CMSA shall remain in full force and effect during any Renewal Term).

18. Termination

18.1 Vaxcyte.

18.1.1 Termination for Convenience. Vaxcyte, in its sole discretion, may terminate this CMSA at any time, without cause, upon written notice to Lonza; provided, that Vaxcyte shall, to the extent commercially reasonable and practicable under the circumstances, give Lonza advanced written notice thereof (with the amount of such advance notice to be determined in Vaxcyte's sole discretion, but in any event, not more than [***] advance notice). [***].

18.1.2 Termination for Cause. Vaxcyte may terminate this CMSA before the expiration of the Term on written notice if Lonza breaches any material provision of this CMSA and either the breach cannot be cured or, if the breach can be cured, it is not cured by Lonza [***] after Lonza's receipt of written notice of such breach.

18.2 Lonza.

18.2.1 Termination for Convenience. Lonza may not terminate this CMSA without cause.

18.2.2 Termination for Cause. Lonza may terminate this CMSA (a) upon [***] prior written notice to Vaxcyte in the event of a non-payment of substantial [***] undisputed amounts due to Lonza by Vaxcyte under this CMSA, unless such non-payment has been cured within such [***].

18.3 Mutual.

18.3.1 Bankruptcy. If either Party shall file, or have filed against it, a petition in bankruptcy, make an assignment for the benefit of its creditors, or have a receiver appointed for its assets, which action shall not be vacated within [***] after such action, then the other Party may terminate this CMSA immediately upon written notice.

18.3.2 Mutual Consent. The Parties may terminate this CMSA upon mutual consent on the terms and conditions mutually agreed to in a letter of termination executed by both Parties. The terms and conditions contained in such letter of termination (a) may conflict with or add to the terms and conditions of this CMSA; and (b) shall supersede the terms and conditions of this CMSA, including with respect to survival.

18.3.3 Rights in Bankruptcy. Certain rights and licenses granted under or pursuant to this CMSA by either Party to the other are, and will otherwise be deemed to be, for purposes of Section 365(n) of the U.S. Bankruptcy Code, licenses of rights to "intellectual property" as defined under Section 101 of the U.S. Bankruptcy Code. The Parties agree that each, as licensees of such rights under this CMSA, will retain and may fully exercise all of its rights and elections under the U.S. Bankruptcy Code and will be subject to all consequent obligations and related waivers, including those set forth in Section 365(n)(2)(C) of the U.S. Bankruptcy Code. The Parties further agree that, in the event of the commencement of a bankruptcy proceeding by or against either Party under the U.S. Bankruptcy Code, upon rejection of this CMSA, if ever, pursuant to Section 365 of the U.S. Bankruptcy Code, or to the extent the bankrupt-Party fails to perform under this CMSA, the non-bankrupt Party will, at its sole election, be entitled to all embodiments of such intellectual property to the extent provided under this CMSA and protected under applicable non-bankruptcy law.

18.4 Consequences of Termination.

18.4.1 Termination Penalties. In the event this CMSA is terminated pursuant to Section 18.1 and such termination is not due to (a) Lonza's failure to achieve material pre-Hand Over timelines or milestones, (b) Suite or Facility inspection or license failure or other regulatory failure which is not cured within [***] (inclusive of any delays due to Force Majeure) of such failure (each, a "Lonza Regulatory Failure"), (c) a Force Majeure Termination, or (d) Casualty Termination, or pursuant to Section 18.2.2, Vaxcyte shall:

(i) forfeit any remaining Repurposing Fee;

(ii) pay to Lonza the greater of (x) CHF70,000,000 or (y) [***] FTE fees for the actual FTEs (directly based on number of FTEs and indirect based on FTE equivalents) assigned to Vaxcyte as of the date of termination (including those FTEs who signed employment agreement or binding employment offer during the [***] period before the receipt of the termination notice); and

(iii) remove Vaxcyte owned equipment within [***] after termination, and remove Raw Materials that (x) cannot be used for future production, (y) cannot be returned to the supplier of the Raw Materials, or (z) are not purchased by Lonza for other customers, within [***] after termination.

Notwithstanding the foregoing, Lonza shall, during the [***] following the effective date of termination, use commercially reasonable efforts to mitigate termination penalties (e.g., by securing a replacement project), and, if successful, Vaxcyte's termination fees will be equitably

reduced based on the amount of time the Suite was utilized or leased by or on behalf Lonza or its customers for commercial purposes. All termination penalties paid are non-refundable; provided, that to the extent Vaxcyte pays a termination penalty that is (or for which the associated cost is) thereafter mitigated by Lonza during such [***] (as described in the foregoing sentence), Lonza shall equitably reimburse Vaxcyte for the amount of such termination penalty that was so mitigated.

18.4.2 Lonza Regulatory Failure; Force Majeure Termination; Casualty Termination. In the event this CMSA is terminated due to a Lonza Regulatory Failure, a Force Majeure Termination, or a Casualty Termination, none of the termination penalties listed in Section 18.4.1 shall apply and Lonza shall refund to Vaxcyte any portion of the Repurposing Fee not paid to Vaxcyte as provided in Section 10.4 within [***] after termination.

18.4.3 Vaxcyte Termination. Solely with respect to a termination described in Sections 18.1, 19 and 23.2, Vaxcyte retains the option to direct Lonza (a) continue to provide some or all of the Services already ordered on a Production Scheduling Form or Services Schedule for up to twelve (12) months from the effective date of termination (to the extent possible in the event of termination under Section 19 and Section 23.2), at Vaxcyte's expense, (b) provide assistance to Vaxcyte with technology transfer of the Manufacturing Process to another facility in accordance with Section 13.8, including entering into a written technology transfer project plan and fully supporting such technology transfer reasonably required by Vaxcyte for up to twenty four (24) months from the effective date of termination at [***] per hour as adjusted for inflation per Section 10.6, and (c) maintain any stability programs that were started prior to notice of termination or were planned to be started within [***] from such notice, at Vaxcyte's expense. Fees paid for such continuing Services shall be either as agreed to prior to effective date of termination or determined in accordance with the CMSA if such determination took place during the Term. For clarity, this Section 18.4.3 shall not apply in the event the CMSA was terminated only as a result of Vaxcyte's failure to timely pay undisputed invoices to Lonza properly issued pursuant to this CMSA.

19. Force Majeure

If a Party is prevented or delayed in the performance of any of its obligations under the CMSA by Force Majeure and such Party (the "Affected Party") gives prompt written notice (but in no event later than [***] of the Affected Party becoming aware of a Force Majeure event so preventing or delaying the Affected Party) thereof to the other party, which notice shall specify the matters the Affected Party asserts constitute Force Majeure, together with such evidence as the Affected Party reasonably can give and specifying the period for which it is estimated that such prevention or delay will continue, the Affected Party and the other Party shall both be excused from the performance or the punctual performance of relevant obligations as the case may be from the date of such notice for so long as such cause of prevention or delay shall continue. For the sake of clarity, a Force Majeure event shall not excuse Vaxcyte from (continuing) paying the fees due under this CMSA (including but not limited to the Suite fee and FTE fee) in order to keep the Suite ready and maintain the ability to provide the Services when resolved. After such initial notification, promptly after request of the other Party, the Affected Party shall use commercially reasonable efforts to mitigate the delay caused by any event of Force Majeure to the extent reasonably commercially practicable. Any dispute between Lonza and Vaxcyte as to whether a matter constitutes Force Majeure or the duration thereof shall be subject to resolution in accordance with the terms of Section 4.2.2. If any Force Majeure event persists for a period of [***] or more, Vaxcyte may terminate this CMSA by delivering written notice to Lonza (a "Force Majeure Termination").

20. Non-Compete

During the Term of this CMSA, [***].

21. Independent Parties

Nothing in this CMSA is intended (or shall be deemed) to constitute a joint venture agreement and, except as expressly set forth herein, nothing herein shall constitute any Party as a partner, principal or agent of any other, this being an agreement between independent contracting entities. Except as expressly set forth herein, no Party shall have the authority to bind any other in any respect whatsoever to Third Parties. Without limiting the generality of the foregoing, all individuals performing any Services or work hereunder for or on behalf of Lonza shall be employees or independent contractors of Lonza and shall not in any event be deemed employees or independent contractors of Vaxcyte or its Affiliates. Vaxcyte shall not be liable for any obligations related to the employment or engagement of such individuals by Lonza and Lonza agrees to defend, hold harmless and indemnify Vaxcyte and Vaxcyte's Indemnitees from and against any loss, damage, liability, suits, claims, actions, investigations, costs and expenses (including reasonable attorney fees) incurred by Vaxcyte or such Vaxcyte Indemnitees as a result of third-party claims to the extent arising out of or in connection with any claim brought by an individual employed or engaged by Lonza to perform any Services or work hereunder or Lonza's other obligations under this CMSA, including any such claims relating to or arising from such employment or engagement by Lonza or claiming that such individual should be treated as the employee or independent contractor of Vaxcyte or its Affiliates. Except as provided herein, nothing contained in this CMSA shall be construed as conferring any right on any Party to use any name, trade name, trademark or other designation of any other Party hereto, unless the express, written permission of such other Party has been obtained.

22. Publicity

Except to the extent required by Applicable Law or the rules of any stock exchange or listing entity, neither Party will make any public statements or announcements concerning this CMSA or the transactions contemplated by this CMSA, or use the other Party's name in any form of advertising, promotion or publicity, without obtaining the prior written consent of the other Party, which consent will not be unreasonably withheld or delayed. Any material statement required by Applicable Law or the rules of any stock exchange or listing entity shall be provided to the other Party for comment prior to it being made, and the terms of this CMSA or any other document relating to the Services shall not be disclosed until each Party has redacted any confidential or proprietary information from it, to the extent permitted by Applicable Law. The Parties agree to issue a joint press release, in a form and substance approved by each Party (such approval not to be unreasonably withheld or delayed), upon execution of the CMSA. The Parties agree that use of each Party's name and logo is permitted in investor materials and public filings made pursuant to applicable securities regulations, so long as such use is not defamatory, negative towards the Party or places the other Party in a bad light.

23. Casualty

23.1 Occurrence of a Casualty. In case of material damage to or destruction of the Build-out, the Suite or the Facility by fire or other casualty (each, a "Casualty"), Lonza shall promptly give written notice thereof to Vaxcyte. Unless this CMSA is terminated as provided in Section 23.2, Lonza, at its sole cost and expense, whether or not the insurance proceeds, if any, shall be sufficient for the purpose, and irrespective of the amount of any loss, shall restore, repair, replace,

rebuild or alter the same as nearly as possible to its value, condition and character immediately prior to such damage or destruction or with such changes or alterations thereto as may be required to comply with Applicable Laws (a "Casualty Restoration"). The Casualty Restoration shall be commenced and prosecuted with reasonable diligence and in good faith until completion; provided, however, if the Casualty Restoration is not substantially completed within [***] following the estimated date for completion as set forth in the Casualty Estimate, Vaxcyte shall have the right to terminate this CMSA.

23.2 Casualty Estimate and Termination. In the event of a Casualty, Lonza shall provide Vaxcyte with a good faith estimate of the time to perform the Casualty Restoration by notice given to Vaxcyte within [***] after the Casualty (the "Casualty Estimate"). If the Casualty is such that all or substantially all of the Facility or the Suite is damaged or the use of the Suite for the Manufacturing Process and/or the Services or access to the Suite or the Facility is materially impaired, then, if the Casualty Estimate estimates that the Casualty Restoration would not be substantially completed within [***] of the Casualty, then Vaxcyte may terminate this CMSA by delivering written notice to Lonza ("Casualty Termination").

23.3 Fee Abatement. Notwithstanding anything to the contrary contained in this CMSA, from and after the date of the Casualty until substantial completion of the Casualty Restoration, all fees and other charges payable by Vaxcyte under this CMSA shall be abated.

23.4 Casualty Termination Affect. Upon a Casualty Termination (a) all fees and other charges payable by Vaxcyte under this CMSA shall be apportioned as of the date of the Casualty and any amounts paid by Vaxcyte for the period following the Casualty shall be promptly refunded by Lonza to Vaxcyte and (b) all rights and obligations of the Parties hereunder shall cease and terminate, except for any liabilities of a Party which accrued prior to the Casualty or obligations that survive any termination of this CMSA.

23.5 Casualty Disputes. Any disputes under Section 23, including, but not limited to, the time period set forth in the Estimate or the duration of any delay due to Force Majeure, shall be resolved in accordance with the procedures set forth in Section 4.2.2.

24. Miscellaneous

24.1 Notices. All notices shall be in writing and signed by an authorized representative of the notifying Party. Parties shall send notices by (a) personal delivery, with receipt acknowledged; (b) prepaid certified or registered mail, return receipt requested; or (c) recognized express/overnight commercial delivery service, with delivery prepaid. Notices shall be deemed given upon delivery. Notices shall be properly addressed to the other Party at the addresses provided below or to any other address designated in writing by a Party (such writing to be in compliance with this Section 24.1).

To Vaxcyte:
Vaxcyte Switzerland GmbH in process of incorporation (*in Gründung*)
c/o Vaxcyte, Inc.
825 Industrial Road
Suite 300
San Carlos, CA 94070
Attn: General Counsel, Legal Department

To Lonza:
Lonza Ltd
Münchensteinerstrasse 38
CH-4002 Basel
Switzerland
Attn: Head of Legal Team, Basel

24.2 Governing Law and Jurisdiction. This CMSA is governed in all respects by the laws [***], without given effect to conflicts of laws except the Applicable Law in the jurisdiction in which the Facility is located shall apply with respect to the Build-out. The Parties agree to submit to the jurisdiction of the courts [***]. EACH PARTY ACKNOWLEDGES AND AGREES THAT ANY CONTROVERSY WHICH MAY ARISE UNDER THIS CMSA IS LIKELY TO INVOLVE COMPLICATED AND DIFFICULT ISSUES, AND THEREFORE EACH SUCH PARTY HEREBY IRREVOCABLY AND UNCONDITIONALLY WAIVES, AND SHALL NOT SEEK, TRIAL BY JURY IN ANY ACTION, PROCEEDING OR COUNTERCLAIM BROUGHT BY ANY PARTY AGAINST ANY OTHER PARTY ARISING OUT OF OR IN ANY WAY CONNECTED WITH THIS CMSA OR THE TRANSACTIONS CONTEMPLATED HEREIN.

24.3 Amendments. Modifications and/or amendments of this CMSA must be in writing specifying what is specifically being amended and signed by the Parties. For clarity, signed meeting minutes shall not be an amendment to this CMSA and does not have the effect of revising the terms and contained in this CMSA.

24.4 Waiver. A waiver by either Party of any of the terms and conditions of this CMSA in any instance will not be deemed or construed to be a waiver of such term or condition for the future, or of any subsequent breach hereof.

24.5 Assignment. Vaxcyte may assign this CMSA (and its rights and obligations hereunder, subject to Section 18.1.1), without Lonza's consent to: (a) any Affiliate of Vaxcyte, or wholly-owned subsidiary or successor-in-interest; or (b) any Third Party in connection with the sale or transfer (by whatever method, including by merger, sale, operation of law or otherwise) of all or substantially all of the business or assets related to this CMSA. No assignment shall relieve Vaxcyte of the responsibility for the performance of any obligation or liability that accrued prior to the effective date of such assignment. Lonza may not assign or transfer this CMSA (or any of its rights or obligations hereunder) without Vaxcyte's prior written consent, which may be granted, denied or upon such conditions as Vaxcyte may require, in each case in Vaxcyte's sole and absolute discretion. Subject to the foregoing, this CMSA shall be binding on the successors and permitted assignees of each Party.

24.6 Severability. If any provision hereof is or becomes at any time illegal, invalid, or unenforceable in any respect, neither the legality, validity nor enforceability of the remaining provisions hereof shall in any way be affected or impaired thereby. The Parties hereto undertake to substitute any illegal, invalid or unenforceable provision by a provision which is as far as possible commercially equivalent considering the legal interests and the Purpose.

24.7 Survival. The rights and obligations of each Party which by their nature survive the termination or expiration of this CMSA shall survive the termination or expiration of this CMSA, including [***].

24.8 Third Party Beneficiaries. This CMSA is solely for the benefit of the Parties and should not be deemed to confer upon any Third Party any remedy, claim, liability, reimbursement, claim of action or other right in excess of those existing without reference to this CMSA (other than in respect of Vaxcyte Indemnitees and Lonza Indemnitees pursuant to Section 15).

24.9 Entire Agreement. With the exception to the subject matter in the Letter Agreement, attached hereto as Appendix I, this CMSA and its Appendices, and [***], contains the entire agreement between the Parties as to the subject matter hereof and supersedes all prior and contemporaneous agreements with respect to the subject matter hereof. This CMSA may be

executed in any number of counterparts, each of which shall be deemed to be an original, and all of which together shall constitute one and the same document. Each Party acknowledges that an original signature or a copy thereof transmitted by facsimile or by.pdf (or an electronic signature) shall constitute an original signature for purposes of this CMSA.

[End of page intentionally left blank.]

In Witness Whereof, each of the Parties hereto has caused the Pre-Commercial Services and Commercial Manufacturing Supply Agreement to be executed by its duly authorized representative(s) effective as of the Effective Date.

VAXCYTE SWITZERLAND GMBH
IN THE PROCESS OF INCORPORATION
(*IN GRÜNDUNG*)

REPRESENTED BY:
VAXCYTE, INC.

By: /s/ Grant Pickering
Name: Grant Pickering
Title: CEO
Date: 10/13/2023

LONZA LTD

By: /s/ Bart Van Aarnhem
Name: Bart Van Aarnhem
Title: Associate General Counsel
Date: 10/13/2023

By: /s/ Iwan Bertholjotti
Name: Iwan Bertholjotti
Title: Senior Director, Commercial Development
Date: 10/13/2023

APPENDIX A

OPERATIONAL PERFORMANCE KPIS

[***]

APPENDIX B
FACILITY BUILD TIMELINE AND BONUSES/PENALTIES

[***]

APPENDIX C
CAPITAL EXPENDITURE

[***]

APPENDIX D
SUITE FEES

[***]

APPENDIX E
FTE FEES

[***]

APPENDIX F
BUFFER

[***]

APPENDIX G
AGENCY MODEL

[***]

APPENDIX H
OVERALL ANTICIPATED BUDGET ESTIMATE

[***]

APPENDIX I
LETTER AGREEMENT

[***]

APPENDIX J
PRE-COMMERCIAL SERVICES

[***]

APPENDIX K
IN-PROCESS CONTROL ("IPC") TESTING SERVICE LEVEL AGREEMENT ("SLA")

[***]

Exhibit 10.19

CERTAIN CONFIDENTIAL INFORMATION CONTAINED IN THIS DOCUMENT, MARKED BY [***], HAS BEEN OMITTED BECAUSE IT IS BOTH (I) NOT MATERIAL AND (II) IS THE TYPE THAT THE REGISTRANT TREATS AS PRIVATE OR CONFIDENTIAL.

MANUFACTURING RIGHTS AGREEMENT

This MANUFACTURING RIGHTS AGREEMENT (this "**Agreement**"), effective as of the Effective Date, is entered into by and between Vaxcyte, Inc., a Delaware corporation ("**Vaxcyte**") and Sutro Biopharma, Inc., a Delaware corporation ("**Sutro**") (each of Vaxcyte and Sutro, a "**Party**," and collectively, the "**Parties**").

WHEREAS, Vaxcyte and Sutro have entered into (i) that certain Amended and Restated SutroVax Agreement, dated October 12, 2015, as amended (the "**License Agreement**"), (ii) that certain Supply Agreement, dated May 29, 2018, as amended (the "**Supply Agreement**"), and (iii) that certain Key Process Transfer Terms regarding [***] (the "**[***] Term Sheet**," and collectively with the License Agreement and the Supply Agreement, the "**Existing Agreements**");

WHEREAS, Vaxcyte and Sutro have entered into that certain letter agreement regarding an Option on Extract Rights, dated December 19, 2022 (the "**Option Agreement**"), pursuant to which Vaxcyte purchased from Sutro an option to obtain certain exclusive rights to manufacture Extract for use in the research, development, use, sale, offering for sale, export, import, commercialization or other exploitation of Vaccine Compositions, as more fully set forth therein;

WHEREAS, Vaxcyte has notified Sutro pursuant to Section 4 of the Option Agreement that Vaxcyte elected to exercise such option, and has paid the Initial Exercise Price as of the Effective Date, and Vaxcyte has paid, or will pay, the Delayed Exercise Price (as defined in the Option Agreement) in accordance with the terms of the Option Agreement; and

WHEREAS, Sutro wishes to grant to Vaxcyte, and Vaxcyte wishes to receive from Sutro, the rights contemplated by such exercised option, as more fully set forth herein and on the terms and conditions set forth herein.

NOW, THEREFORE, in consideration of the foregoing and the mutual agreements, provisions and covenants contained in this Agreement, and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, and intending to be legally bound hereby, the Parties hereby agree as follows:

ARTICLE I
DEFINITIONS

Section 1.1General. As used in this Agreement (including the foregoing Recitals), the following terms shall have the meanings set forth in this Section 1.1. All capitalized terms used

but not defined in this Agreement shall have the meanings assigned to them in the Existing Agreements.

(a) "**Acquirer**" has the meaning set forth in Section 14.8(a).

(b) "**Affiliate**" means, with respect to either Party, any business entity controlling, controlled by, or under common control with such Party. For the purpose of this definition only, "control" means (A) the possession, directly or indirectly, of the power to direct the management or policies of a business entity, whether through the ownership of voting securities, by contract or otherwise, or (B) the ownership, directly or indirectly, of at least fifty percent (50%) of the voting securities or other ownership interest of a business entity. Notwithstanding the above, in no event shall Sutro (or any entity that would be an Affiliate of Vaxcyte solely because it is an Affiliate of Sutro) be deemed an Affiliate of Vaxcyte, or Vaxcyte (or any entity that would be an Affiliate of Sutro solely because it is an Affiliate of Vaxcyte) be deemed an Affiliate of Sutro.

(c) "**Agreement**" has the meaning set forth in the Preamble.

(d) "**Announcing Party**" has the meaning set forth in Section 14.18.

(e) "**Approved CMO**" means (A) the CMOs set forth on **Schedule 2.15.1** to the Supply Agreement, (B) [***], and (C) any other CMO proposed by Vaxcyte and approved by Sutro (such approval not to be unreasonably withheld, conditioned or delayed).

(f) "**Approved Contractor**" means any reputable Third Party contractor (excluding any CMO) to be utilized by Vaxcyte to provide services or undertake activities for the benefit of Vaxcyte to support technology transfer or the exercise of the Manufacturing Rights (including, for clarity, any audit under Section 7.1).

(g) "**Audit Report**" has the meaning set forth in Section 7.3(a).

(h) [***].

(i) "**[***] Letter Agreement**" [***].

(j) "**[***] Letter of Intent**" [***].

(k) "**[***] Term Sheet**" [***].

(l) "**cGMP**" has the meaning set forth in the Supply Agreement.

(m) "**Change of Control**" has the meaning set forth in the License Agreement.

(n) "**Change of Control Party**" has the meaning set forth in Section 14.8(a).

(o) "**Claim**" has the meaning set forth in Section 11.1.

(p) "**CMO**" means any Third Party (or any joint venture between Sutro (or its Affiliates) and a Third Party) that manufactures, or is capable (including following any Tech

Transfer of the applicable Sutro Know-How and Sutro Core Know-How) of manufacturing, Extract.

(q)"**Commercially Reasonable Efforts**" has the meaning set forth in the License Agreement.

(r) "**Declining Party**" has the meaning set forth in Section 5.4(e).

(s) "**Designated Jurisdictions**" has the meaning set forth in Section 3.3.

(t) "**Discloser's Information**" has the meaning set forth in Section 6.1(a).

(u)"**Dispute**" has the meaning set forth in Section 13.2.

(v)"**Dispute Notice**" has the meaning set forth in Section 13.2.

(w)"**DMF**" means drug master file or any equivalent such file used in support of a biologics license.

(x)"**Effective Date**" means (A) the Execution Date, if the Parties execute this Agreement after Vaxcyte exercises the Option pursuant to Section 4(a) of the Option Agreement, or (B) if Vaxcyte exercises the Option pursuant to Section 4(a) of the Option Agreement after the Execution Date, the date this Agreement is released from escrow pursuant to the terms and conditions of the Option Agreement.

(y)"**Enforcement Action**" has the meaning set forth in Section 5.5(a)(ii).

(z) "**Execution Date**" means the date this Agreement is signed by both Parties.

(aa)"**Existing Agreement**" has the meaning set forth in the Recitals.

(bb)"**Extract**" means any extract derived from strains of E. coli and (A) supplied to Vaxcyte or its Affiliates by or on behalf of Sutro pursuant to the Existing Agreements, the [***] Letter Agreement or any subsequent written agreement between the Parties or their respective Affiliates, or (B) made by or on behalf of Vaxcyte or its Affiliates pursuant to this Agreement. For clarity, Extract includes [***].

(cc)[***].

(dd)"**Facility Audit**" has the meaning set forth in Section 7.2(a).

(ee)"**FDA**" means the U.S. Food and Drug Administration, and any successor entity thereto.

(ff)"**First Tech Transfer**" has the meaning set forth in Section 4.1(a).

(gg)"**FTE Rate**" means [***], which represents the fully burdened rate for such full-time equivalent and covers all employee salaries and benefits. Commencing January 1, 2024, and

upon every January 1st thereafter during the Term, the FTE Rate will be adjusted in accordance with [***].

(hh)"**Governmental Authority**" has the meaning set forth in the Supply Agreement.

(ii)"**Indemnified Parties**" has the meaning set forth in Section 11.3.

(jj)"**Indemnifying Party**" means the Party obligated to indemnify the applicable Indemnified Parties pursuant to Section 11.1 or Section 11.2, as applicable.

(kk)"**Joint Patent**" has the meaning set forth in Section 5.4(b).

(ll)"**Jointly-Owned IP**" has the meaning set forth in Section 5.1(a).

(mm)"**Lab Audit**" has the meaning set forth in Section 7.3(b).

(nn)"**Lead Enforcement Party**" has the meaning set forth in Section 5.5(a)(iv).

(oo)"**License Agreement**" has the meaning set forth in the Recitals.

(pp)"**Manufacture**" means to manufacture, process, store, test, retain samples of, quality control, release and dispatch, and to conduct other activities reasonably necessary in furtherance of any of the foregoing.

(qq)"**Manufacturing Rights**" has the meaning set forth in Section 2.1(a).

(rr)[***].

(ss)"**New IP**" means, collectively and including all intellectual property rights therein, any and all (A) [***] and (B) other improvements to the Sutro Platform, that are, in each case of the foregoing clauses (A) and (B), developed by or on behalf of Vaxcyte, its Affiliates or Sublicensees (as defined in the License Agreement) pursuant to Vaxcyte's exercise of the Manufacturing Rights, or other rights under the Existing Agreements, the [***] Letter Agreement or otherwise.

(tt)"**Option Agreement**" has the meaning set forth in the Recitals.

(uu)"**Party**" and "**Parties**" have the meaning set forth in the Preamble.

(vv)"**Patent**" has the meaning set forth in the License Agreement.

(ww)"**Payee**" has the meaning set forth in Section 8.2(b).

(xx)"**Payor**" has the meaning set forth in Section 8.2(b).

(yy)"**Principal Contact**" has the meaning set forth in Section 13.1.

(zz)"**Regulatory Approval**" has the meaning set forth in the License Agreement.

(aaa)"**Restricted Systems**" has the meaning set forth in Section 6.2.

(bbb)"**Restricted Systems Audit**" has the meaning set forth in Section 7.4.

(ccc)"**Rules**" has the meaning set forth in Section 13.3(a).

(ddd)"**Second Tech Transfer**" has the meaning set forth in Section 4.2.

(eee)"**Segregated Technology**" has the meaning set forth in Section 14.8(d).

(fff)"**Senior Management**" has the meaning set forth in Section 13.2.

(ggg)"**Step-In Party"** has the meaning set forth in Section 5.4(e).

(hhh)"**Successful Completion**" or "**Successfully Completed**" means the successful manufacture, at the facility receiving the applicable Tech Transfer, of [***] cGMP batches of Extract that meet the relevant specifications with no material, major or critical cGMP deviations.

(iii)"**Supply Agreement**" has the meaning set forth in the Recitals.

(jjj)"**Sutro**" has the meaning set forth in the Preamble.

(kkk)"**Sutro Core Know-How**" means any processes, documents, and materials or other Sutro Know-How that are, subject to Section 14.8 of this Agreement, owned or controlled by Sutro at any time during the Term of this Agreement and that relate to the manufacture or supply of Extracts (including, but not limited to, Sutro Know-How regarding the generation and/or use of strains from which Extract is produced).

(lll)"**Sutro Indemnitees**" has the meaning set forth in Section 11.1.

(mmm)"**[***] IP**" has the meaning set forth in Section 5.1(c).

(nnn)"**Sutro Know-How**" means all information and materials pertaining to the Extracts or Vaccine Compositions, or the manufacture, use or, in the case of Vaccine Compositions, development thereof, as the case may be, that are, subject to Section 14.8 of this Agreement, owned or controlled by Sutro or its Affiliates at any time during the Term of this Agreement, including (A) practices, protocols, methods, techniques, specifications, formulae, standard operating procedures, analytical methods, material and vendor lists, (B) analytical, quality control and stability data, batch records, and other chemistry, manufacturing and control (CMC) data, (C) regulatory documentation, and (D) tangible materials and reagents; in each case as and to the extent reasonably necessary or useful for Vaxcyte to exercise the rights granted to it under the Existing Agreements (during the relevant term of such Agreements) or this Agreement. Notwithstanding the foregoing, in no event shall Sutro Know-How include any information or materials of Sutro's Third Party collaborators or sublicensees, except for such information or materials pertaining to the Sutro Platform which Sutro has the right to provide to Vaxcyte in accordance with this Agreement.

(ooo)"**Sutro Patents**" means any Patents, subject to Section 14.8 of this Agreement, owned or controlled by Sutro or its Affiliates at any time during the Term of this Agreement covering the Sutro Platform, Extracts, Vaccine Compositions or the Manufacture or use thereof.

(ppp)"**Sutro Platform**" has the meaning set forth in the License Agreement.

(qqq)"**Tech Transfer**" means the technology transfer to Vaxcyte, its Affiliate or an Approved CMO designated by Vaxcyte (for clarity, other than [***]) of any and all know-how, materials and information (including any Sutro Know-How, Sutro Core Know-How, technical information, and documentation and data directed to Manufacturing, testing and standard operating procedures) owned or controlled by Sutro (subject to Section 14.8 of this Agreement) or its Affiliates as is necessary or useful to enable Vaxcyte, such Affiliate or such Approved CMO (as applicable) to Manufacture Extract using Sutro's then-current Manufacturing process, including any such know-how, materials and information as would be needed for Vaxcyte, such Affiliate or such Approved CMO (as applicable) to scale up such Manufacture of Extract to reasonably required commercial volumes (and including by Sutro making available its applicable personnel on-site to provide technical support and trouble-shooting in furtherance of the foregoing). For the avoidance of doubt, references to Tech Transfer in this Agreement shall include Process Transfers (as defined in the Supply Agreement), as applicable.

(rrr)"**Term**" has the meaning set forth in Section 12.1.

(sss)"**Third Party**" means any person or entity other than Sutro, Vaxcyte and their respective Affiliates.

(ttt)"**Vaccine Composition**" has the meaning set forth in the License Agreement.

(uuu)"**Vaccine Field**" has the meaning set forth in the License Agreement.

(vvv)"**Vaccine Field Infringement**" has the meaning set forth in Section 5.5(a)(i).

(www)"**VAT**" has the meaning set forth in Section 8.2(a).

(xxx)"**Vaxcyte**" has the meaning set forth in the Preamble.

(yyy)"[***] **Extract IP**" has the meaning set forth in Section 5.1(b).

(zzz)"[***] **Extract Patent**" has the meaning set forth in Section 5.5(a)(i).

(aaaa)"**Vaxcyte Indemnitees**" has the meaning set forth in Section 11.2.

(bbbb)"[***] **IP**" has the meaning set forth in Section 5.1(d).

(cccc)"[***] **Patent**" has the meaning set forth in Section 5.4(c).

(dddd)"**Winddown Period**" has the meaning set forth in Section 12.6(a)(ii).

ARTICLE II
GRANTS OF RIGHTS

Section 2.1 Manufacturing Rights.

(a) Subject to the terms and conditions of this Agreement, Sutro hereby grants to Vaxcyte the following (collectively, the "**Manufacturing Rights**"):

(i) an exclusive (except as to Sutro), perpetual (subject to Article XII), worldwide, non-sublicensable (except as set forth in Section 2.3), at no additional royalty (i.e., royalty-free, other than any royalties due under the License Agreement), fully paid-up (subject to Vaxcyte's payment of the Exercise Price and any Milestone Payments due in accordance with the Option Agreement, each such term as defined in the Option Agreement) license under the Sutro Patents, Sutro Know-How, Sutro Core Know-How, [***] IP and Sutro's ownership interest in and to any Jointly-Owned IP to Manufacture or have Manufactured Extract and [***] (in any form, including fresh, liquid, frozen and spray-dried forms), solely for use in the research, development, use, production, sale, offering for sale, export, import, commercialization or other exploitation of Vaccine Compositions; and

(ii) solely in connection with Vaxcyte's exercise of the rights granted pursuant to the foregoing Section 2.1(a)(i), (A) as between the Parties, the authority and control over, and ability to address, regulatory (subject to, and including the rights set forth in, Article III), quality assurance, quality control and batch release matters in respect of such Manufacture of such Extract and [***] (and the resulting Manufactured Extract and [***]), and (B) the right to access and use, and to permit Approved CMOs to access and use, Sutro Know-How and Sutro Core Know-How; provided, that:

(1) Vaxcyte shall not have the right to make changes to Sutro's DMF or other regulatory filings for Extract or [***] without Sutro's prior written consent; provided, further, that, for clarity, Vaxcyte shall have the right to make and amend its own regulatory filings in respect of Extract and [***] made by or on behalf of Vaxcyte in connection with Vaccine Compositions developed by Vaxcyte; and

(2) Approved Contractors shall not have the right to access, transfer or use any cell banks (including master and working cell banks) that constitute Sutro Core Know-How, except for purposes of storage, quality control and characterization of cell banks, and making new working cell banks, in support of Vaxcyte's exercise of the Manufacturing Rights, or as otherwise consented to by Sutro (such consent not to be unreasonably withheld, conditioned or delayed in respect of activities reasonably necessary or useful in support of Vaxcyte's exercise of the Manufacturing Rights).

(b) For clarity, (A) the Manufacturing Rights will not include the right for Vaxcyte to operate as a contractor manufacturer for a Third Party (i.e., to Manufacture Extract for sale to Third Parties for the independent use of such Third Parties); provided, that, for clarity, the Manufacturing Rights shall include the right to, and Vaxcyte may, Manufacture and supply Extract to Vaxcyte's

Sublicensees (as defined in, and subject to the terms of, the License Agreement), and (B) the Manufacturing Rights shall include the right to make [***].

(c) For the avoidance of doubt, the Manufacturing Rights (and the rights granted by Sutro to Vaxcyte under this Agreement), shall be in addition to, and shall not in any way limit, the licenses and rights granted by Sutro to Vaxcyte under the Existing Agreements, the [***] Letter Agreement or the [***] Letter of Intent (including, for example, that the Manufacturing Rights shall apply with respect to any process, platform, composition, extract or intellectual property developed (or otherwise acquired) by Sutro following the effective date of the Option Agreement or the Effective Date of this Agreement (including any improvements to or in respect of the Sutro Platform, Extract, or the process for Manufacturing Extract), if such process, platform, composition, extract or intellectual property would be covered by the licenses and rights granted to Vaxcyte under the Existing Agreements). The Parties acknowledge and agree that the Manufacturing Rights do not include the right to manufacture, sell or offer to sell Vaccine Compositions, which are addressed under the License Agreement, or any other rights licensed to Vaxcyte pursuant to Section 4.1(a) of the License Agreement, and if and to the extent a composition is a Vaccine Composition under the License Agreement, then notwithstanding anything herein to the contrary, such composition shall continue to be a Vaccine Composition under the License Agreement for payment purposes, including royalties, as set forth in the License Agreement (for clarity, subject to Section 5.2 hereof). For clarity, (i) nothing in this Agreement (including Vaxcyte's practice of the Manufacturing Rights) shall alter or limit Vaxcyte's royalty payment obligations under the License Agreement (for clarity, subject to Section 5.2 hereof), and (ii) in the event that the License Agreement is terminated, but this Agreement remains in effect, Vaxcyte shall not have the right to manufacture, sell or offer to sell Vaccine Compositions under this Agreement (or to practice hereunder any other rights that are licensed to Vaxcyte pursuant to Section 4.1(a) of the License Agreement to the extent not expressly included in the Manufacturing Rights). Notwithstanding anything to the contrary in the License Agreement, nothing in the License Agreement shall require Vaxcyte to provide Sutro notice or obtain Sutro's consent (or otherwise restrict Vaxcyte's rights) in respect of the exercise of the Manufacturing Rights under (and in accordance with the terms of) this Agreement (including the Manufacture of Extract and [***] by an Approved CMO).

Section 2.2Restrictions on Use Outside of Manufacturing Rights. Vaxcyte covenants not to use any Sutro Know-How or Sutro Core Know-How outside of the scope of the Vaccine Field or the scope of the Manufacturing Rights (except as permitted pursuant to the Existing Agreements, the [***] Letter Agreement or any subsequent written agreement between the Parties or their respective Affiliates). For clarity, the Vaccine Field includes the research, development, use, sale, offering for sale, export, import, commercialization or other exploitation of Vaccine Compositions for prophylactic, therapeutic and/or companion diagnostic applications. In addition, Vaxcyte shall not, except as permitted pursuant to this Agreement, the Existing Agreements, the [***] Letter Agreement or a subsequent written agreement between the Parties or their respective Affiliates, (A) sell, transfer, lease, exchange or otherwise dispose of or provide Extract to any Third Party, (B) knowingly use Extract to produce cancer vaccines or any other proteins except for Vaccine

Compositions, and (C) use Extract in human subjects, in clinical trials, or for diagnostic purposes involving human subjects.

Section 2.3Sublicensing.

(a) Vaxcyte shall have the right to extend Vaxcyte's rights and obligations hereunder (including the right to sublicense the Manufacturing Rights through multiple tiers) to its Affiliates (for clarity, including both current and future Affiliates, but only for so long as the applicable entity is an Affiliate of Vaxcyte); provided, that [***]. In the event that any Affiliate of Vaxcyte enters into an agreement with an Approved CMO or Approved Contractor that includes a sublicense of any of the Manufacturing Rights, then such agreement shall provide that, if such Affiliate ceases to be an Affiliate of Vaxcyte prior to such agreement being assigned or transferred to Vaxcyte or another Affiliate of Vaxcyte, such agreement will immediately terminate or be automatically assigned or transferred by such Affiliate to Vaxcyte (or another Affiliate of Vaxcyte), at Vaxcyte's discretion.

(b) Vaxcyte, and Vaxcyte's Affiliates to which Vaxcyte granted a sublicense under Section 2.3(a), may sublicense the Manufacturing Rights through a single tier to Approved CMOs and Approved Contractors for the benefit of Vaxcyte (but not, for clarity, for the independent commercial use of such Approved CMOs or Approved Contractors). Each sublicense granted to an Approved CMO or Approved Contractor pursuant to this Section 2.3(b) shall be granted pursuant to a written agreement between the Approved CMO or Approved Contractor and Vaxcyte that [***]. With respect to any Approved CMO, and any Approved Contractor that will have access to, or use, Sutro Core Know-How:

(i) Vaxcyte shall provide to Sutro Vaxcyte's proposed agreement with such Approved CMO or Approved Contractor at least [***] prior to Vaxcyte executing such agreement, and Vaxcyte shall [***];

(ii) In the event any Approved CMO or Approved Contractor breaches such agreement with Vaxcyte with respect to provisions of such agreement relating to safeguarding the Sutro Know-How and Sutro Core Know-How, then upon Sutro's reasonable request, Vaxcyte will use Commercially Reasonable Efforts to enforce such agreement (and to otherwise fully cooperate with Sutro in enforcing Sutro's rights in Sutro Know-How and Sutro Core Know-How) against such Approved CMO or Approved Contractor in respect of such breach, [***]. Any amounts recovered by Sutro or Vaxcyte in enforcing any such claim shall be paid as follows: [***]; and

(iii) Vaxcyte shall include all reasonably necessary and appropriate protections for Sutro's applicable intellectual property rights (including provisions to effect Sutro's ownership of the New IP) in any such agreement with an Approved CMO or Approved Contractor for manufacturing Extract, and such Approved CMO or Approved Contractor shall not be permitted thereunder to use any intellectual property or Discloser's Information of Sutro, except in connection with the exercise of the Manufacturing Rights on behalf of Vaxcyte (or as otherwise may be authorized by Sutro in writing). Vaxcyte shall provide to Sutro copies of the applicable contractual provisions in such agreement related to

protection of Sutro's intellectual property with such Approved CMO or Approved Contractor, and shall [***].

ARTICLE III
REGULATORY MATTERS

Section 3.1 Regulatory Activities for Vaccines.

(a) Notwithstanding anything to the contrary in the Existing Agreements, as between Vaxcyte and Sutro, Vaxcyte shall have full control (subject to Section 3.3 in respect of efforts to maintain confidentiality of Sutro Know-How and Sutro Core Know-How and the scope of Vaxcyte's regulatory rights set forth in the Manufacturing Rights), in its sole and absolute discretion, with respect to any and all regulatory matters related to research, development, Manufacture or commercialization of a Pneumococcal Conjugate Vaccine or other Vaccine Composition developed by or on behalf of Vaxcyte and Manufactured using Extract or [***] (including the preparation and filing of investigational new drug applications and biologic license applications (and foreign equivalents thereof) with any applicable regulatory authorities and any interactions therewith); provided, [***].

(b) Vaxcyte shall have the right to (A) reference Sutro's DMF (and any regulatory filings and Regulatory Approvals controlled by Sutro) with respect to any regulatory filings or Regulatory Approvals relating to [***] made by or on behalf of Vaxcyte in accordance with the Manufacturing Rights or otherwise relating to Vaccine Compositions (or any components thereof) produced using Extract or [***] (or to otherwise include information from Sutro's DMF therein), and (B) file its own DMF (or other applicable regulatory filings) in respect of the foregoing (in which case, Sutro shall provide Vaxcyte with chemistry, manufacturing and controls data and other data reasonably required for such filings). If the FDA or other applicable Governmental Authority requires that certain information in the possession or control of Sutro regarding Extract or [***] (or any component of the Vaccine Compositions) be expressly included in any of Vaxcyte's regulatory filings or Regulatory Approvals described in the foregoing clause (A) above (e.g., in the event the FDA declines to permit Vaxcyte to rely upon Sutro's DMFs in support of any regulatory filings or Regulatory Approvals and Vaxcyte has a reasonable need to include such information in its regulatory filings under applicable laws or regulations), then to the extent not already provided to Vaxcyte, Sutro shall provide Vaxcyte such information for inclusion therein (subject to Section 3.3 in respect of efforts to maintain confidentiality of Sutro Know-How and Sutro Core Know-How).

Section 3.2 Regulatory Activities for Extract and [***]. Vaxcyte shall have the right to control (to the extent included in the Manufacturing Rights) regulatory matters related to [***] made by or on behalf of Vaxcyte in accordance with the Manufacturing Rights (including, for clarity, regulatory submissions and interactions in connection with any such resulting [***] made by or on behalf of Vaxcyte in accordance with the Manufacturing Rights), and Sutro will have the right to control all other regulatory matters related to Extract and [***]. Vaxcyte and Sutro shall cooperate in good faith on a mutually agreeable regulatory strategy relating to Extract and [***]

made by Vaxcyte, and each Party shall not take any action that would materially and adversely affect the other Party's regulatory interests in respect of Extract or [***].

Section 3.3Confidentiality in Regulatory Submissions. Vaxcyte shall use reasonable best efforts, to the extent permitted under applicable laws and regulations, to maintain the confidentiality of any Sutro Know-How and Sutro Core Know-How in regulatory documents submitted by or on behalf of Vaxcyte. If any Sutro Know-How or Sutro Core Know-How is required by applicable laws or regulations to be included in regulatory documents to be submitted by or on behalf of Vaxcyte, Vaxcyte shall be permitted to do so; [***].

Section 3.4Safety Data. Each Party understands and acknowledges that the other Party and its Affiliates and respective licensees and sublicensees may need to access, utilize and include certain safety data (e.g., adverse event reports) pertaining to products made using Extract (including [***]) in its applicable regulatory materials and filings as required by applicable law. Each Party shall have the right to share any and all such safety data generated by the other Party or the other Party's Affiliates, licensees or sublicensees with such first Party's Affiliates and other Third Parties (including its licensees and sublicensees) as permitted by Section 6.1.

Section 3.5Cooperation. Each Party agrees to (A) during the Term, make its personnel reasonably available at their respective places of employment to consult with the other Party on issues related to the activities conducted in accordance with this Article III or otherwise relating to the Manufacture of Extract, [***] or Vaccine Compositions Manufactured through the use of Extract in connection with any request from any Regulatory Authority, including any such request with respect to regulatory, scientific, technical and clinical testing issues, or otherwise, and (B) for a period of [***] after the Effective Date, otherwise provide such assistance as may be reasonably requested by the other Party from time to time in connection with the activities conducted in accordance with this Article III. Each Party shall reimburse the other Party for the following costs incurred by such other Party in connection with this Section 3.5: (A) [***]; and (B) [***].

ARTICLE IV
TECHNOLOGY TRANSFER

Section 4.1First Tech Transfer.

(a) Upon Vaxcyte's request to Sutro following the Successful Completion (or other termination or abandonment) of Sutro's technology transfer to [***] under the Existing Agreements (as modified by this Agreement), the [***] Letter Agreement, the [***] Letter of Intent or any other subsequent written agreement between the Parties or their respective Affiliates, Sutro shall support and cooperate with Vaxcyte to conduct a Tech Transfer to Vaxcyte, or an Affiliate of Vaxcyte or an Approved CMO (other than [***]) designated by Vaxcyte, in a manner sufficient for Vaxcyte to fully exercise the Manufacturing Rights at the facilities of such designated recipient (the "**First Tech Transfer**"). Without limiting the generality of the foregoing, in connection with the First Tech Transfer, Sutro shall (A) provide to the designated recipient of the First Tech Transfer full access to [***] necessary or useful for the Manufacture of Extract using Sutro's then-current Manufacturing process, to the extent owned or controlled by Sutro or its Affiliates, and (B) make its relevant personnel reasonably available to Vaxcyte or its designated

recipient (whether its Affiliate or an Approved CMO) for technical support and trouble-shooting (both off and on-site) with respect to the Manufacture of Extract; [***].

(b) **Schedule 1** to this Agreement sets forth certain know-how, materials and information to be transferred by Sutro in connection with its obligations under Section 4.1(a) (which Sutro shall transfer as part of the First Tech Transfer), the timeline for conducting the First Tech Transfer, the responsibilities of each Party in connection with the First Tech Transfer, and each Party's respective personnel to be involved in performing the First Tech Transfer; provided, that (i) the Parties acknowledge that the information on such **Schedule 1** as of the Execution Date may not be fulsome or accurately reflect the intended First Tech Transfer given that it has been prepared potentially significantly in advance of the First Tech Transfer, and (ii) the Parties shall, acting reasonably and in good faith, mutually agree upon updates, revisions and additions to such **Schedule 1** to more accurately reflect the requirements for the First Tech Transfer reasonably in advance of the anticipated start of the First Tech Transfer. The Parties may modify **Schedule 1** by mutual written agreement.

(c) Vaxcyte shall reimburse Sutro for the following costs incurred by Sutro in performing the First Tech Transfer: (A) [***]; and (B) [***].

(d) Following Successful Completion of the First Tech Transfer, Sutro shall not be obligated to notify or transfer to Vaxcyte [***] made by or on behalf of Sutro (other than Available Extracts), except in connection with a Second Tech Transfer (or as otherwise may be agreed by the Parties in writing in respect of another Tech Transfer).

(e) Sutro shall use Commercially Reasonable Efforts to fulfill its obligations in connection with the First Tech Transfer. [***].

(f) For the avoidance of doubt, any Tech Transfer shall exclude any Patents, know-how and other intellectual property of an Acquirer (as defined in the License Agreement) of Sutro pursuant to Section 14.8 of this Agreement and pursuant to Section 15.2 of the License Agreement.

Section 4.2Second Tech Transfer. Upon Vaxcyte's reasonable request, made no earlier than [***] and no later than [***], Sutro shall support and cooperate with Vaxcyte to conduct an additional Tech Transfer to Vaxcyte, or an Affiliate of Vaxcyte or an Approved CMO designated by Vaxcyte, in a manner sufficient for Vaxcyte to fully exercise the Manufacturing Rights at the facilities of such designated recipient (the "**Second Tech Transfer**"). Section 4.1 shall apply to the Second Tech Transfer, *mutatis mutandis* (i.e., the rights and obligations of the Parties with respect to the First Tech Transfer shall apply in the same manner to the Second Tech Transfer).

Section 4.3Reverse Tech Transfer. In the event that Vaxcyte or its Approved CMO makes [***] and successfully scales up manufacture of Extract incorporating such [***] to the applicable commercial volumes of such [***] pursuant to its exercise of the Manufacturing Rights, upon Sutro's reasonable request to Vaxcyte, Vaxcyte shall conduct a technology transfer to Sutro of know-how, materials and information in Vaxcyte's control to the extent necessary or useful for Sutro to implement the relevant [***] for the manufacture of Extract incorporating such [***].

Sutro shall reimburse Vaxcyte for the following costs incurred by Vaxcyte in performing such technology transfer: (A) [***]; and (B) [***].

Section 4.4Existing Tech Transfer Obligations. For clarity, the obligations of the Parties in this Article IV are intended, and shall be deemed, to be in addition to and not in limitation of Sutro's obligations to perform any Tech Transfers to [***] pursuant to the Existing Agreements (as modified by this Agreement), the [***] Letter Agreement, the [***] Letter of Intent or any other subsequent written agreement between the Parties or their respective Affiliates.

Section 4.5Excess Capacity; Supply to Sutro. Following Successful Completion of (A) the First Tech Transfer or Second Tech Transfer to an Approved CMO's facility, or to Vaxcyte's or its Affiliates' internal facility, or (B) the technology transfer to [***] (with respect to frozen liquid Extract) pursuant to the [***] Letter Agreement, if there is excess capacity at the facility where such Tech Transfer (or technology transfer) was Successfully Completed, upon Sutro's reasonable request to Vaxcyte the Parties shall negotiate in good faith for a reasonable period of time with respect to Sutro's use of such excess capacity for itself or Sutro's other customers. In the event that Sutro purchases frozen liquid Extract from an Approved CMO or Vaxcyte in respect of the foregoing clause (A), or from [***] in respect of the foregoing clause (B), Sutro shall first reimburse Vaxcyte for [***]; provided, that for clarity, Sutro shall not be obligated to reimburse Vaxcyte for [***].

ARTICLE V
INTELLECTUAL PROPERTY

Section 5.1Ownership of Intellectual Property. Notwithstanding anything to the contrary in the Existing Agreements, as between the Parties and their respective Affiliates:

(a) Vaxcyte and Sutro shall jointly own any New IP that is a method of using Extract or [***] that relates to both the Vaccine Field and to other applications outside the Vaccine Field (such methods, including all intellectual property rights therein, the "**Jointly-Owned IP**");

(b) [***] shall solely own all New IP (excluding the Jointly-Owned IP, which shall be subject to joint-ownership as provided herein) that is a method of using Extract or [***] that relates solely to [***] (such methods, including all intellectual property rights therein, the "**[***] Extract IP**");

(c) [***] shall solely own all New IP (excluding Jointly-Owned IP, which shall be subject to joint-ownership as provided herein, and [***] Extract IP) (the "[***] **IP**," and any Patent claiming such [***] IP, a "[***] **New IP Patent**"); and

(d) Notwithstanding anything to the contrary in this Agreement, [***] shall solely own any and all inventions and intellectual property rights therein (and Patents and know-how with respect thereto) conceived, made, developed or otherwise invented by or on behalf of [***], its Affiliates or sublicensees that are directed to the composition, formulation or use of a [***] through the use of Extract or [***]) (the "**[***] IP**").

Section 5.2Licensed-Back; Effect on Royalties. The [***] IP shall be (and is hereby) licensed back to Vaxcyte under the License Agreement (and, for clarity, this Agreement) on the same terms

as the Sutro Patents, Sutro Know-How and Sutro Core Know-How are licensed under the License Agreement (as amended and modified by this Agreement) and this Agreement, respectively; provided, that notwithstanding anything to the contrary herein or in the Existing Agreements, Sutro acknowledges and agrees that neither Sutro's ownership of any such [***] IP nor Sutro's ownership interest in any Jointly-Owned IP shall cause the Royalty Term under the License Agreement to extend [***] (i.e., such ownership or ownership interest [***] in respect of the references to [***] in the definition of [***], the definition of [***] or in [***]). Each Party's interest in the Jointly-Owned IP shall be subject to the licenses granted under the Existing Agreements and this Agreement (and is hereby licensed in such manner), such that [***] shall have the exclusive right to exploit and freely sublicense the Jointly-Owned IP [***] in accordance with the Existing Agreements and this Agreement, and [***] shall have the exclusive right to exploit and freely sublicense the Jointly-Owned IP [***] in accordance with the Existing Agreements and this Agreement, in each case, without the obligation to obtain any consent from (or account to) the other Party in respect thereof.

Section 5.3Assignment of Intellectual Property. If and to the extent that Vaxcyte or its Affiliates obtains any ownership interest in or to any [***] IP, Vaxcyte hereby assigns, and shall cause its Affiliates to assign, to Sutro all such ownership interest in [***] IP. In addition, if and to the extent necessary to effectuate the joint ownership between Vaxcyte and Sutro of the Jointly-Owned IP, Vaxcyte hereby assigns, and shall cause its Affiliates to assign, to Sutro its and their ownership interest in and to the Jointly-Owned IP as is necessary to fully effectuate such joint ownership contemplated in Section 5.1(a).

Section 5.4Patent Prosecution.

(a) Sutro shall not file (and shall prohibit its Affiliates from filing) any Patents claiming any [***] IP or [***] Extract IP. Vaxcyte shall not file (and shall prohibit its Affiliates, Approved CMOs and Approved Contractors from filing) any Patents claiming [***] IP or Jointly-Owned IP, and Vaxcyte will reasonably cooperate with Sutro in connection with any filings for such Patents.

(b) Notwithstanding anything to the contrary in the Existing Agreements, [***] shall have the first right to control the prosecution of Patent applications covering Jointly-Owned IP (each, a "**Joint Patent**"); provided, that:

(i) The Parties shall reasonably cooperate and collaborate in good faith with respect to any such prosecution and strategy related thereto, and [***] shall keep [***] up-to-date and reasonably informed, including by providing to [***] drafts of all Patent applications and other material submissions and communications with any applicable Governmental Authorities (including, for clarity, patent offices) reasonably in advance of any submission thereof to enable [***] to comment thereon;

(ii) [***] shall take [***] direction in respect of such Joint Patent (including in respect of prosecution strategy and claims) [***]; provided, that [***]; and

(iii) With respect to matters not covered under Section 5.4(b)(ii) [***] shall reasonably consider incorporating [***] comments; [***].

(c) [***] shall, at the request of [***] and to the extent permitted by applicable law,

file a continuation or divisional Patent application from each such Joint Patent, which continuation or divisional has claims [***] (each a "**[***] Patent**"). [***] shall prosecute each such [***] Patent according to [***] reasonable instructions and [***]. Upon issuance of each such [***] Patent, [***] shall, and hereby does, and shall cause its Affiliates to, assign to [***] or its Affiliates' right, title and interest in and to each such [***] Patent. With respect to any Joint Patent and related [***] Patent [***], the Parties shall coordinate and cooperate in good faith regarding, and discuss in good faith, the appropriate claim strategies for such continuations and divisionals [***].

(d) Notwithstanding anything to the contrary in this Agreement, if prior to the filing of any Joint Patent, [***] notifies [***] that it wishes to protect [***], then the Parties shall discuss in good faith and mutually agree upon a reasonable approach to take in respect thereof prior to filing any such Joint Patent (subject to the escalation procedure set forth in Section 5.4(f)). [***].

(e) In respect of any Joint Patent, if the Party controlling prosecution determines it does not want to pursue (or does not want to continue to pursue or maintain) such Joint Patent (such Party, the "**Declining Party**"), then the other Party shall have the right to pursue (or, as applicable, continue to pursue and maintain) such Joint Patent on its own (such Party, the "**Step-In Party**"). In such event, [***].

(f) If, in connection with this Section 5.4, the Parties are obligated to discuss in good faith and mutually agree upon a reasonable approach to take, and representatives of the Parties are unable to mutually agree upon such a reasonable approach, either Party may [***], Article XIII shall apply.

Section 5.5 Enforcement.

(a) Generally.

(i) Notice. If either Party reasonably believes that any [***] Patent (including any [***] New IP Patent), Joint Patent, [***] Patent or Patent covering [***] Extract IP ("**[***] Extract Patent**") is being infringed by a Third Party with respect to activities within the scope of the Vaccine Field, or is subject to a declaratory judgment action arising from such activities (a "**Vaccine Field Infringement**"), such Party shall promptly notify the other Party and the Parties shall discuss in good faith how best to respond.

(ii) [***] Enforcement. As between the Parties, [***] shall have the first right, but not the obligation, itself or through a designee, to enforce [***], including (A) initiating or prosecuting an infringement or other appropriate suit or action against such Third Party, and (B) defending any declaratory judgment action with respect thereto (the type of action described in each of (A) and (B), an "**Enforcement Action**").

(iii) [***] Enforcement. As between the Parties, [***] shall have the first right, but not the obligation, itself or through a designee, to enforce [***] (i.e., (x) initiating or prosecuting an infringement or other appropriate suit or action against a Third Party, and (y) defending any declaratory judgment action with respect thereto) [***]. As between the Parties, [***] shall have the sole right to initiate and control any Enforcement Action [***] with respect to any Vaccine Field Infringement.

(iv) Secondary Enforcement. Reasonably in advance of undertaking any Enforcement Action under Section 5.5(a)(ii) or Section 5.5(a)(iii), the Party with the first right to undertake such Enforcement Action (the "**Lead Enforcement Party**") shall notify the other Party of its intent to take such Enforcement Action. In the event a Party does not initiate an Enforcement Action with respect to a particular Patent for which it is the Lead Enforcement Party within [***] of a request from the other Party to do so, such other Party shall have the right, but not the obligation, itself or through a designee, to initiate and control such Enforcement Action at its discretion and expense.

(v) Recoveries. Any amounts recovered by Vaxcyte or Sutro with respect to an Enforcement Action under this Section 5.5(a) will be used first to reimburse the reasonable costs and expenses, including attorneys' fees, incurred in bringing and maintaining the applicable Enforcement Action, then to satisfy any Third Party obligations with respect to such recovery, and any remainder by Vaxcyte or Sutro shall be allocated between the Parties as follows: (A) if Vaxcyte is the enforcing Party: [***] shall be paid to Sutro, and the remainder shall be retained by Vaxcyte; and (B) if Sutro is the enforcing Party: [***] shall be retained by Sutro, and [***] shall be paid to Vaxcyte; provided, that if another patent controlled by Vaxcyte or its licensee is also being enforced with respect to the same infringing party or product, then the portion retained by Sutro under the foregoing clauses (B) shall be [***] (and [***] shall be paid to Vaxcyte).

(b) Sutro Patents. As between the Parties, Sutro shall have the sole right, but not the obligation, itself or through a designee, at its cost to enforce (i.e., (x) initiating or prosecuting an infringement or other appropriate suit or action against a Third Party, and (y) defending any declaratory judgment action with respect thereto) [***].

(c) Cooperation. If a Party brings an Enforcement Action in accordance with Section 5.5(a), the other Party shall reasonably cooperate, including, if required to bring such action, joining as a named party. The Parties shall keep one another informed of the status of their respective activities regarding any Enforcement Action pursuant to Section 5.5(a) or settlement thereof, and the Parties shall assist one another and cooperate in any such action at the other's reasonable request. Neither Party shall have the right to settle any Enforcement Action under Section 5.5(a) in a manner that [***].

ARTICLE VI
CONFIDENTIALITY

Section 6.1 Confidentiality.

(a) In the course of performing the transactions contemplated by this Agreement, whether before or after the Effective Date, a Party may disclose, or may have disclosed, to the other Party confidential information owned or controlled by the disclosing Party ("**Discloser's Information**"). The receiving Party will maintain in confidence the Discloser's Information and will not use it for any purpose except for purposes authorized hereunder, and shall use Commercially Reasonable Efforts to safeguard such information against disclosure to Third Parties, including employees and persons working or consulting for such Party that do not have an established, current need to know such information for purposes authorized under this Agreement.

This obligation of confidentiality does not apply to restrict use or disclosure by the receiving Party of technology, information or material that meet one or more of the following criteria: (A) they were properly in the possession of the receiving Party, without any restriction on use or disclosure, prior to receipt from the other Party; (B) they are at the time of disclosure hereunder in the public domain by public use, publication, or general knowledge; (C) they become general or public knowledge through no fault of the receiving Party following disclosure hereunder; (D) they are properly obtained by the receiving Party from a Third Party not under a confidentiality obligation to the disclosing Party hereto; or (E) they are independently developed by or on behalf of the receiving Party without the assistance of the confidential information of the other Party. Subject to the exceptions in the foregoing clauses (A)-(C) above, and notwithstanding the definition of "Discloser's Information" above, (x) all data and results generated by or on behalf of Vaxcyte with respect to Vaccine Compositions (excluding Sutro Patents, Sutro Know-How, Sutro Core Know-How, Jointly-Owned IP and [***] IP) shall be deemed Discloser's Information of Vaxcyte, (y) confidential information comprising the Sutro Patents, Sutro Know-How, Sutro Core Know-How and [***] IP shall be deemed Discloser's Information of Sutro, and (z) confidential information comprising the Jointly-Owned IP, and the terms and conditions of this Agreement, shall be deemed Discloser's Information of both Parties.

(b) Each Party may use and disclose Discloser's Information of the other Party as follows:

(i) under appropriate confidentiality provisions substantially equivalent to those in this Agreement in connection with the performance of its obligations or exercise of rights granted to such Party in this Agreement;

(ii) in communication with, whether existing or potential, investors, acquirers, lenders, consultants, advisors (including financial advisors, lawyers and accountants), (sub) licensees, collaborators or service providers, in each case on a need to know basis under appropriate confidentiality provisions substantially equivalent to those of this Agreement; and

(iii) if a Party is required by judicial or administrative process to disclose the Discloser's Information of the other Party hereto; provided, that in such instance, such Party shall promptly inform such other Party of the anticipated disclosure in order to provide it an opportunity to challenge or limit the disclosure obligations. Discloser's Information that is disclosed by judicial or administrative process shall remain otherwise subject to the confidentiality and non-use provisions of this Agreement, and, in disclosing the other Party's Discloser's Information pursuant to law or court order, each Party shall take reasonable steps to ensure the continued confidential treatment of such Discloser's Information.

(c) Notwithstanding Section 6.1(b)(iii) above, a receiving Party may disclose Discloser's Information of the other Party to Governmental Authorities as required by securities laws or rules of securities exchanges; provided, that the receiving Party shall provide reasonable advance notice to the other Party of such disclosure and use Commercially Reasonable Efforts, to oppose such disclosure or to request confidential treatment of such Discloser's Information and, in any event, shall only disclose the minimum information, as reasonably determined by the

receiving Party's legal counsel, that is necessary to comply with such requirements.

(d) Without limiting the generality of Section 6.1(a) (and subject to the foregoing subclauses in this Section 6.1), Vaxcyte (A) acknowledges and agrees that Sutro Know-How and Sutro Core Know-How constitutes Discloser's Information of Sutro that Vaxcyte shall maintain as confidential in accordance with Section 6.1, (B) shall take necessary and appropriate measures to maintain the trade secret status under applicable law of any Sutro Know-How or Sutro Core Know-How that Sutro reasonably indicates to Vaxcyte it regards as its trade secret, and (C) shall implement measures that are substantially similar to any commercially reasonable measures taken by Sutro as of the Effective Date to maintain the confidentiality of Sutro Know-How and Sutro Core Know-How, to the extent Sutro notifies Vaxcyte in writing of such measures.

Section 6.2Restricted Systems. Vaxcyte (or its Affiliates or sublicensees, as applicable) shall establish [***] and safeguards that are designed to ensure that Sutro Core Know-How [***] to avoid use of such Sutro Core Know-How outside the scope of the Manufacturing Rights (or such other uses permitted under the Existing Agreements, [***] Letter Agreement or any subsequent written agreement between the Parties or their respective Affiliates), by ([***] (the "**Restricted System**"), [***].

ARTICLE VII
AUDITS

Section 7.1Audits by Vaxcyte.

(a) Vaxcyte shall be responsible to audit, or have audited by an Approved Contractor in accordance with Section 7.1(c), any Third Party facility used by Vaxcyte, its Affiliates or an Approved CMO to manufacture Extract to ensure compliance with the terms of this Agreement and the terms of any written agreement between Vaxcyte (or its Affiliates) and such Approved CMO, as applicable, relating to [***].

(b) Vaxcyte shall use Commercially Reasonable Efforts to provide to, or obtain for, Sutro tag-along rights with respect to such audits by or on behalf of Vaxcyte of such Third Party facility (i.e., obtain for Sutro the right to participate in such audits conducted by or on behalf of Vaxcyte of such Third Party facility). [***].

(c) Vaxcyte shall be permitted (at its discretion), but shall not be required, to conduct an audit pursuant to Section 7.1(a) through an Approved Contractor; provided, that Vaxcyte's agreement with any such Approved Contractor shall (among other things) contain appropriate provisions with respect to safeguarding Sutro Know-How and Sutro Core Know-How to the extent the same will be accessed by such Approved Contractor pursuant to such audit, including, if and to the extent applicable, heightened protections for such Sutro Know-How and Sutro Core Know-How that Sutro reasonably indicates to Vaxcyte it regards as its trade secret.

Section 7.2Manufacturing and Storage Facility Audits by Sutro.

(a) In the event that Vaxcyte or its Affiliates manufacture Extract in their facilities, or store any cell banks that constitute Sutro Core Know-How in their facilities, Sutro shall have the right to have such facilities where Extract is manufactured or such cell banks are located (and

related records) audited by an independent auditor (in accordance with Section 7.2(b)) to ensure compliance with the terms of this Agreement relating to [***] (each such audit, a "**Facility Audit**").

(b) Sutro shall not be permitted to conduct Facility Audits more frequently than [***], unless Sutro has reasonable cause to conduct a Facility Audit in respect of a suspected material violation by Vaxcyte or its Affiliate(s) of the relevant provisions of this Agreement referenced in Section 7.2(a). Prior to conducting any Facility Audit, Sutro shall provide reasonable advanced written notice to Vaxcyte, but in any event at least [***] (or at least [***] in the event of reasonable cause) prior to such Facility Audit. Each Facility Audit shall be: (A) limited to no more than [***] for on-site visits; (B) limited solely to the facilities where Extract is manufactured or cell banks are located; (C) conducted by an independent, reputable and established Third Party auditor to be mutually agreed-upon by the Parties acting reasonably and in good faith, and subject to each such auditor (x) entering into a written non-disclosure agreement (or similar agreement) with Vaxcyte, (y) being accompanied by Vaxcyte's representatives at all times during any on-site audit, and (z) complying with all applicable reasonable Vaxcyte policies and procedures; (D) conducted at mutually agreeable times during normal business hours; and (E) conducted in a manner intended to avoid and minimize any disruption to Vaxcyte's and such facilities' business operations.

Section 7.3Research and Development Facility Audits by Sutro. In the event that Vaxcyte or its Affiliates use Extract for research and development purposes, Sutro shall have the right to audit such use of Extract as follows:

(a) Upon receipt of a written request from Sutro (such request to be made by Sutro no more frequently than [***]), Vaxcyte shall provide to Sutro a written report setting forth [***] (each such report, an "**Audit Report**"). Each Audit Report shall [***]. Sutro shall treat each Audit Report (and all information therein) as Discloser's Information of Vaxcyte.

(b) Following receipt of each Audit Report, in the event that Sutro has reasonable concerns based on such Audit Report that Vaxcyte (or its Affiliate) has used Extract for research and development activities outside the Vaccine Field (other than in a manner permitted in a subsequent written agreement between the Parties or their respective Affiliates), Vaxcyte and Sutro shall discuss (and use reasonable efforts to resolve) in good faith any such concerns. If, following such good faith discussions and the exercise of reasonable efforts by both Parties to resolve any such concerns of Sutro, Sutro still has a good faith and reasonable concern that Vaxcyte or its Affiliates are using Extract for research and development activities outside the Vaccine Field (other than in a manner otherwise permitted in a subsequent written agreement between the Parties or their respective Affiliates), Sutro shall have the right to have the facilities of Vaxcyte or its Affiliates where such research and development activities occur (and relevant records in such facilities related to such activities) audited by an independent auditor (in accordance with Section 7.3(c)) to ensure compliance with the terms of this Agreement relating to use of Extract by Vaxcyte or its Affiliates outside of the Vaccine Field (other than in a manner otherwise permitted in a written agreement between the Parties or their respective Affiliates) (each such audit, a "**Lab Audit**").

(c) Sutro shall not be permitted to conduct Lab Audits more frequently than [***]. Prior to conducting any Lab Audit, Sutro shall provide reasonable advanced written notice to

Vaxcyte, but in any event at least [***] prior to such Lab Audit. Each Lab Audit shall be: (A) limited to no more than [***] for on-site visits; (B) limited solely to the facilities (and solely to the particular areas within such facilities) where such Extract is used for such research and development activities; (C) limited to the documents necessary to confirm there is no use of Extract outside of the Vaccine Field, and be conducted in a manner that avoids access to Discloser's Information and other materials of Vaxcyte and its Affiliates that is not related to use of Extract, including through the use of reasonable measures by Vaxcyte or its Affiliates to protect such Discloser's Information and other materials; (D) conducted by an independent, reputable and established Third Party auditor to be mutually agreed-upon by the Parties acting reasonably and in good faith, and subject to each such auditor (x) entering into a written non-disclosure agreement (or similar agreement) with Vaxcyte, (y) being accompanied by Vaxcyte's representatives at all times during any on-site audit, and (z) complying with all applicable reasonable Vaxcyte policies and procedures; (E) conducted at mutually agreeable times during normal business hours; and (F) conducted in a manner intended to avoid and minimize any disruption to Vaxcyte's and such facilities' business operations.

(d) Sutro shall reimburse Vaxcyte for the following costs incurred by Vaxcyte and its Affiliates in connection with any Audit Report and each Lab Audit (including, for clarity, actions taken to generate the Audit Report): (A) [***]; and (B) [***].

Section 7.4 Restricted Systems Audits by Sutro. Sutro shall have the right to audit Vaxcyte's Restricted Systems to ensure compliance with Section 6.2 (each such audit, a "**Restricted Systems Audit**"). Sutro shall not be permitted to conduct Restricted Systems Audits more frequently than [***], unless Sutro has reasonable cause to conduct a Restricted Systems Audit in respect of a suspected material violation of Section 6.2 of this Agreement by Vaxcyte or its Affiliate(s). Prior to conducting any Restricted Systems Audit, Sutro shall provide reasonable advanced written notice to Vaxcyte, but in any event at least [***] (or at least [***] in the event of reasonable cause) prior to such Restricted Systems Audit. Each Restricted Systems Audit shall be conducted [***].

ARTICLE VIII
PAYMENTS

Section 8.1 Payment Procedures. Each Party shall submit an invoice to the other Party for any payments or reimbursements due to such first Party under this Agreement, and such other Party shall pay any amounts set forth on such invoice (that are not disputed in good faith) within [***] of receipt of such invoice (and reasonable documentation evidencing any such amounts due, including supporting documentation and information reasonably necessary to validate such amounts due). All such payments shall be made in U.S. dollars in immediately available funds by wire transfer from a bank account located in the U.S. to such bank account in the U.S. as may be designated in writing by the receiving Party from time to time.

Section 8.2 Taxes.

(a) Any consideration payable pursuant to this Agreement is exclusive of any value added tax ("**VAT**"). If any VAT is chargeable on any of the transactions contemplated under this Agreement and is payable to the respective tax authority by the Party making the supply or providing the service for VAT purposes, upon receipt of a valid invoice in accordance with the

applicable VAT law from the supplying or service providing Party, the other Party shall pay such VAT in addition to the consideration otherwise due pursuant to this Agreement.

(b) Each Party (in such capacity, "**Payor**") shall be entitled to deduct and withhold, or cause to be deducted and withheld, any amounts from any consideration payable pursuant to this Agreement as are required to be deducted and withheld under applicable law with respect to taxes and will secure and send to the other Party (in such capacity, "**Payee**") written evidence that such deducted and withheld amounts were paid over to the applicable taxing authority. The Parties shall reasonably cooperate, and shall cause their respective Affiliates to reasonably cooperate, in order to reduce or eliminate any amounts that would be required to be deducted and withheld on payments made pursuant to this Agreement under applicable law. To the extent such amounts are so deducted or withheld and paid over to the applicable taxing authority, such amounts will be treated for all purposes of this Agreement as having been paid to the person or entity to whom such amounts would otherwise have been paid. Notwithstanding the foregoing, if, directly as a result of any (A) assignment or transfer of this Agreement by Payor, (B) Change of Control of Payor, or (C) redomicile, change in tax residence or similar corporate restructuring by Payor, the tax withholdings hereunder exceed the tax withholdings that would have resulted in the absence of such action, then Payor shall pay to Payee such additional amounts as are necessary so that Payee receives the amounts that it would have received if there had been no such action.

ARTICLE IX
EMPLOYEE MATTERS

Section 9.1 Non-Solicitation. During the Term, each Party shall not knowingly solicit or hire any employee of the other Party who has access to Sutro Know-How or Sutro Core Know-How or is otherwise involved in any material respect with a Tech Transfer under this Agreement; provided, that notwithstanding the foregoing, nothing in this Section 9.1 shall prevent either Party from (A) making (or hiring or soliciting any employee of the other Party pursuant to) a general solicitation which is not directed specifically to such employee of the other Party, or (B) hiring or soliciting any former employee of the other Party who has not been employed by the other Party for at least [***] prior to such hiring or solicitation or whose employment has been terminated by the other Party.

ARTICLE X
REPRESENTATIONS AND WARRANTIES; CERTAIN COVENANTS

Section 10.1 Mutual Representations and Warranties. Each Party represents and warrants to the other Party, as of the Effective Date, that: (A) it is a corporation duly organized, validly existing and in good standing under the laws of its jurisdiction of formation; (B) it has full corporate power and authority to execute, deliver and perform this Agreement, and has taken all corporate action required by applicable law and its organizational documents to authorize the execution and delivery of this Agreement and the consummation of the transactions contemplated by this Agreement; (C) this Agreement constitutes a valid and binding agreement enforceable against it in accordance with its terms; (D) all consents, approvals and authorizations from all Governmental Authorities or other Third Parties required to be obtained by it in connection with this Agreement have been obtained; (E) the execution and delivery of this Agreement, and the consummation of the transactions contemplated hereby, do not and shall not (x) conflict with or result in a breach of

any provision of its organizational documents, (y) result in a breach of any other agreement to which it is a party, or (z) violate any appliable law; (F) it has and will at all times during the Term comply with all applicable laws in all material respects, including obtaining all necessary licenses, permits, and authorizations necessary to perform this Agreement and to exploit any license or rights granted to it hereunder, as now or hereafter required under any applicable statutes, laws, ordinances, rules and regulations; and (G) it has not prior to the Effective Date and shall not during the Term (x) have been debarred under Article 306 of the FDCA, 21 U.S.C. § 335a(a) or (b), or any equivalent foreign or local law, rule or regulation, or (y) use or employ in any capacity related to the subject matter of this Agreement or activities hereunder any individual, corporation, partnership, or association which has been debarred under Article 306 of the FDCA, 21 U.S.C. § 335a(a) or (b), or any equivalent foreign or local law, rule or regulation.

Section 10.2Sutro Representations and Warranties. Sutro represents and warrants to Vaxcyte, as of the Effective Date, that: (A) except as disclosed (based on events that have arisen between the Execution Date and the Effective Date) by Sutro to Vaxcyte in writing within [***] of Vaxcyte's written notification to Sutro that Vaxcyte is considering exercising the Option (as defined in the Option Agreement) in accordance with Section 4 of the Option Agreement or within [***] of receipt of the Option Notice if Vaxcyte does not provide the foregoing notice, to its knowledge (after inquiring with Sutro's patent counsel regarding their actual knowledge gained through representation of Sutro in patent matters and without their conduct of any additional inquiry), the exercise of the Manufacturing Rights in accordance with the terms of this Agreement (and the performance by Sutro of the Tech Transfers contemplated hereunder) do not and shall not infringe on, misappropriate or otherwise violate any Patents or other intellectual property rights of any Third Party (and, as of the Effective Date, no Third Party has made any Claim alleging the same), (B) it has not granted prior to the Effective Date rights to any Third Party that are inconsistent with the rights granted to Vaxcyte under this Agreement, and (C) it has not amended or terminated the [***] In-License in any manner that would adversely affect Vaxcyte's rights under this Agreement.

Section 10.3Covenants. Sutro covenants that it will not (A) grant any rights to any Third Party that are inconsistent with the rights granted to Vaxcyte under this Agreement, or (B) amend or terminate the [***] In-License in any manner that would adversely affect Vaxcyte's rights under this Agreement. To the extent the license granted under Section 2.1(a) includes a sublicense under Sutro's rights under the [***] In-License, then (i) the Parties acknowledge and agree that this Agreement shall be subject to, and limited by, the terms of the [***] ln-License, and (ii) Vaxcyte covenants to comply with the terms set forth in Exhibit E of the License Agreement in connection herewith.

ARTICLE XI
INDEMNIFICATION; DISCLAIMERS; LIMITATION OF LIABILITY

Section 11.1Indemnification by Vaxcyte. Vaxcyte agrees to indemnify and hold harmless Sutro, its Affiliates and sublicensees, and their respective agents, directors, officers and employees and their respective successors and assigns (collectively, the "**Sutro Indemnitees**") from and against any Third Party claim, suit, demand, investigation or proceeding brought by any Third Party (each, a "**Claim**") based on (A) the Manufacture of any Extract (including [***]) by or on behalf of Vaxcyte, its Affiliates or Approved CMOs, including (i) any Claim alleging infringement of any

Third Party intellectual property rights by such Manufacture (excluding infringement arising from practice of any Sutro Know-How, Sutro Core Know-How or Sutro Patents that are not New IP) or (ii) the failure of Vaxcyte to Manufacture and use Extract in material compliance with all applicable laws, regulations and guidelines (including such applicable laws, regulations and guidelines governing handling and disposal of hazardous materials), but, for clarity, excluding any Claim covered by Sutro's indemnification obligation under Section 11.2(A), (B) breach of any representation, warranty, covenant or obligation of Vaxcyte in this Agreement, or (C) any gross negligence or willful misconduct of Vaxcyte or its Affiliates. This indemnification obligation shall not apply to the extent the relevant Claim is due to the negligence or willful misconduct of a Sutro Indemnitee or a breach of any of Sutro's representations, warranties, covenants or obligations under this Agreement.

Section 11.2Indemnification by Sutro. Sutro agrees to indemnify and hold harmless Vaxcyte, its Affiliates and Sublicensees, and their respective agents, directors, officers and employees and their respective successors and assigns (the "**Vaxcyte Indemnitees**") from and against any Claim based on (A) misappropriation by Sutro of any Third Party trade secrets in connection with the Sutro Platform (other than New IP), (B) breach of any representation, warranty, covenant or obligation of Sutro in this Agreement, or (C) any gross negligence or willful misconduct of Sutro or its Affiliates. This indemnification shall not apply to the extent that the relevant Claim is due to the negligence or willful misconduct of a Vaxcyte Indemnitee or a breach of any of Vaxcyte's representations, warranties, covenants or obligations under this Agreement.

Section 11.3Indemnification Procedures. The obligation to indemnify pursuant to Section 11.1 or Section 11.2 shall be contingent upon: timely notification by the Sutro Indemnitees or Vaxcyte Indemnitees, as applicable (the "**Indemnified Parties")** to the Party obligated to Indemnifying Party of any claims, suits or service of process (provided that the Indemnifying Party shall not be absolved of its indemnification obligation under Section 11.1 or Section 11.2 other than to the extent such delay or failure to notify the Indemnifying Party materially prejudices the Indemnifying Party's ability to defend against such Claim); the tender by the Indemnified Parties to the Indemnifying Party of full control over the conduct and disposition of any such claim, demand or suit; and reasonable cooperation by the Indemnified Parties in the defense of the claim, demand or suit. No Indemnifying Party will be bound by or liable with respect to any settlement or admission entered or made by any Indemnified Parties without the prior written consent of the Indemnifying Party (which shall not be unreasonably withheld, conditioned or delayed). The Indemnified Parties will have the right to retain their own counsel to participate in its defense in any Claim hereunder. In such event, the Indemnified Parties shall pay for their own counsel, except to the extent it is determined that (A) one or more legal defenses may be available to it which are different from or additional to those available to the Indemnifying Party, or (B) representation of two Parties by the same counsel in respect of such Claim would be inappropriate due to actual or potential differing interests between them. In any such case and to such extent, the Indemnifying Party shall be responsible to pay for the reasonable costs and expenses of the separate counsel retained to participate in the defense of the Indemnified Parties; provided, that such expenses are otherwise among those covered by the Indemnifying Party's indemnification obligations hereunder.

Section 11.4Disclaimer. THE WARRANTIES AND INDEMNITIES STATED IN THIS AGREEMENT ARE IN LIEU OF, AND THE PARTIES EACH DISCLAIM, ALL OTHER

WARRANTIES, EXPRESS, IMPLIED OR ARISING BY LAW, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. WITHOUT LIMITING THE FOREGOING, SUTRO MAKES NO REPRESENTATION THAT ANY TECH TRANSFER OR VAXCYTE'S MANUFACTURE OF EXTRACT OR THE USE THEREOF WILL BE SUCCESSFUL.

Section 11.5Limitation of Liability. Neither Party shall be liable under this Agreement for any indirect, incidental, punitive, exemplary, special or consequential damages of any kind; provided, that this limitation will not (A) reduce or affect either Party's indemnification obligations under Section 11.1 or Section 11.2, (B) apply to willful or intentional breaches of this Agreement, (C) limit a Party's liability in respect of breaches of confidentiality obligations hereunder, or (D) limit Vaxcyte's liability in respect of breaches of Section 2.2 in respect of use of Extract, [***] or Sutro Core Know-How outside of the Vaccine Field. Without limiting the generality of the foregoing, Sutro shall have no liability to Vaxcyte with respect to any losses to the extent arising from (A) implementation of any [***] by Vaxcyte or an Approved CMO (including [***]) on behalf of Vaxcyte, or (B) any claims of failure to supply, product quality or product liability arising from Extract Manufactured by Vaxcyte, its Affiliates or any Approved CMO (including [***]) pursuant to a direct contract between such Approved CMO and Vaxcyte or its Affiliates.

ARTICLE XII
TERM; TERMINATION

Section 12.1Term. Subject to Section 14.1, this Agreement shall commence as of the Effective Date and shall continue in full force and effect in perpetuity unless and until terminated in accordance with Section 12.2, Section 12.3 or Section 12.4 (the "**Term**").

Section 12.2Mutual Termination. The Parties may terminate this Agreement after the Effective Date upon the mutual written agreement of both Parties.

Section 12.3Termination by Vaxcyte. Vaxcyte may terminate this Agreement after the Effective Date for any or no reason upon at least [***] prior written notice to Sutro.

Section 12.4Termination by Sutro.

(a) Sutro may terminate this Agreement after the Effective Date upon [***] written notice to Vaxcyte in the event that (A) Vaxcyte materially breaches Section 3.3 or Article VI in respect of confidentiality of Sutro Know-How or Sutro Core Know-How (except as otherwise permitted in a subsequent written agreement between the Parties or their respective Affiliates), in a manner that causes actual, material harm to Sutro's business, (B) such breach was intentional, and (C) Vaxcyte does not cure such breach within such [***]; provided, that such [***] shall be extended for up to [***] if Vaxcyte is using diligent efforts in good faith to cure such breach.

(b) Sutro may terminate this Agreement after the Effective Date upon [***] written notice to Vaxcyte in the event that (A) Vaxcyte materially breaches Section 2.2 in respect of use of the Sutro Core Know-How (including any Extract and [***]) outside of the Vaccine Field [***], except as otherwise permitted in a subsequent written agreement between the Parties or their respective Affiliates, (B) such breach was intentional, and (C) Vaxcyte does not cure such breach within such [***]; provided, that such [***] shall be extended for up to [***] if Vaxcyte is using

diligent efforts in good faith to cure such breach.

(c) Sutro may terminate this Agreement after the Effective Date upon [***] written notice to Vaxcyte in the event that (A) Vaxcyte materially breaches Section 2.2 in respect of use of the Sutro Core Know-How (including any Extract and [***]) outside of the Vaccine Field (except as otherwise permitted in a subsequent written agreement between the Parties or their respective Affiliates), (B) such breach was unintentional, and (C) Vaxcyte fails to use reasonable best efforts to cease and (to the extent reasonably curable) cure such breach in a timely fashion after written notice of such breach.

(d) Sutro may terminate this Agreement after the Effective Date upon [***] prior written notice to Vaxcyte in the event that (A) Vaxcyte fails to pay the Exercise Price (as defined and set forth in Section 4 of the Option Agreement) or any undisputed Milestone Payment (as defined and set forth in Section 5 of the Option Agreement) when due, and (B) does not cure such nonpayment within such [***].

Section 12.5Cure of Unintentional Breach. Vaxcyte covenants that it shall use reasonable best efforts to cure any unintentional material breach by Vaxcyte or its Affiliates (or its or their employees) of Section 10 of the License Agreement (as amended by this Agreement) or Article VI of this Agreement, in each case of which it is notified in writing by Sutro. For clarity, Sutro shall have no right to terminate this Agreement for breach of this Section 12.5.

Section 12.6Consequences of Termination; Survival.

(a) Consequences of Termination. In the event of any termination of this Agreement after the Effective Date in accordance with the terms of this Agreement:

(i) The Manufacturing Rights and all sublicenses thereto granted by Vaxcyte or its Affiliates, and all other rights granted by a Party to the other Party pursuant to this Agreement, shall immediately terminate, subject to Section 12.6(a)(ii).

(ii) Vaxcyte shall promptly, at its own cost and expense, wind-down its and its Affiliates' Manufacture of Extract (for clarity, including [***]); provided that in the event that the License Agreement remains in effect and has not been terminated, Vaxcyte, its Affiliates and Sublicensees shall have the right to use any inventory of such Extract existing or in-process as of the effective date of termination solely to manufacture Vaccine Compositions in accordance with the License Agreement for a period of [***] after the effective date of termination (the "**Winddown Period**"), and the Manufacturing Rights shall continue during the Winddown Period solely as necessary for Vaxcyte to conduct such activities during the Winddown Period (including, for clarity, to finish the manufacture of Extract in-process as of the effective date of the termination), and any such activities shall be subject to the terms and conditions of this Agreement. Within [***] after the end of the Winddown Period (or within [***] of the effective date of termination in the event that the License Agreement is not in effect or has been terminated as of the effective date or termination), Vaxcyte shall provide a written report to Sutro listing any remaining inventory of such Extract in the possession or control of Vaxcyte, its Affiliates, Sublicensees, Approved CMOs or Approved Contractors, if any, and the location thereof.

Within [***] of Sutro's receipt of such report, Sutro shall notify Vaxcyte in writing whether it (A) desires to purchase any or all of such inventory at Vaxcyte's manufacturing cost thereof (without markup), in which case the Parties shall effect such sale in good faith, or (b) desires Vaxcyte to destroy such inventory, in which case Vaxcyte shall destroy such inventory (or cause such inventory to be destroyed), at Vaxcyte's cost and in compliance with Applicable Laws. In the case of such destruction, Vaxcyte shall promptly provide Sutro with a written acknowledgement from the general counsel or a senior in-house attorney for Vaxcyte that, to the knowledge of such individual, such destruction has occurred.

(iii) At the disclosing Party's election, the receiving Party shall return or destroy all tangible materials to the extent comprising or containing any Discloser's Information of the disclosing Party that are in receiving Party's or its Affiliates' possession or control and provide written confirmation of such destruction to the disclosing Party; provided, that (A) the receiving Party shall not be obligated to return or destroy any such Discloser's Information of the disclosing Party necessary or useful to exercise any continuing rights that such Party has under this Agreement (including during the Winddown Period) or any other agreement in effect between the Parties (or to which the receiving Party has access, or related rights or obligations, under such other agreement), and (B) the receiving Party shall not be required to destroy electronic files containing such Discloser's Information of the disclosing Party that are made in the ordinary course of its business information back-up procedures pursuant to its electronic record retention and destruction practices that apply to its own general electronic files and information.

Section 12.7Survival. In the event of any termination of this Agreement after the Effective Date in accordance with the terms of this Agreement, each of the Parties shall be released from all obligations under this Agreement, except for any obligations accrued prior to the effective date of the termination, during the Winddown Period or that survive pursuant to this Section 12.7. Notwithstanding the foregoing, the following provisions shall survive the termination of this Agreement after the Effective Date: Section 1.1, Section 2.3(b)(ii), Section 3.1(a) (solely in the event the License Agreement is in effect; provided, that Vaxcyte shall not have the right to file any new DMFs for Vaccine Compositions, or other regulatory filings containing Sutro Core Know-How, in its own name after the effective date of termination of this Agreement, except that, for clarity, Vaxcyte shall retain the right and authority to make filings and submissions in connection with its then-extant investigational new drug applications and biologic license applications (and foreign equivalents thereof), or other regulatory filings, relating to Extract, including annual reports, product or labeling supplements, and any filing that the FDA or other Governmental Authority requires in relation to such investigational new drug applications and biologic license applications (and foreign equivalents thereof), or other regulatory filings, even where such filing might implicate Sutro's Core Know-How, chemistry, manufacturing and control (CMC) data, or DMFs), Section 3.1(b)(A) (solely in the event the License Agreement is in effect), Section 3.3 (as applicable), Section 3.4, the last sentence of Section 4.5, Section 5.1, Section 5.2 (solely with respect to the Royalty Term under the License Agreement), Section 5.3, Section 5.4, Section

5.5(b), Section 6.1, Section 8.1, Section 8.2, Article XI, Section 12.6(a)(ii), Section 12.6(a)(iii), this Section 12.7, Section 13.3, Section 13.4, Section 13.5, Article XIV.

Section 12.8Termination not Sole Remedy. The Parties acknowledge and agree that any termination pursuant to this Article XII shall be in addition to, and not in limitation or lieu of, any other remedy to which the Parties are entitled at law or in equity (which remedies shall remain available to the Parties), whether or not termination of this Agreement is effected.

ARTICLE XIII
COMMUNICATION AND DISPUTE RESOLUTION

Section 13.1Each Party will appoint an individual employed by it to serve as its "**Principal Contact**" for purposes of this Agreement. Either Party may from time to time replace its Principal Contact with a different employee, but unless required due to the termination of the Principal Contact's employment or events beyond the applicable Party's control, neither Party will replace its Principal Contact without at least [***] prior notice to the other Party. The Principal Contacts shall communicate with each other regularly during the Term as the Parties may agree or as the Principal Contacts shall mutually determine to be useful.

Section 13.2The Parties intend that, to the maximum extent practicable, they shall reach decisions hereunder cooperatively through discussions among the Principal Contacts and by mutual consent of the Parties. In situations in which that does not occur, any disputes, controversies, claims or differences arising out of or in connection with this Agreement or the breach, termination or validity thereof, and any question of the arbitral tribunal's jurisdiction or the existence, scope or validity of these arbitration provisions or the arbitrability of any claim (each a "**Dispute**") shall initially be referred for review by delivery of a written notice (a "**Dispute Notice**") by either Party's Principal Contact to each of the Parties' respective Senior Managements (as defined below). Such Senior Managements shall discuss the Dispute, and shall meet with respect thereto if either of them believes a meeting or meetings are likely to be useful. As used herein, Sutro's "**Senior Management**" means [***], and Vaxcyte's "**Senior Management**" means [***].

Section 13.3If the Senior Managements are not able to resolve such Dispute referred to them under Section 13.2 within [***] from the date of delivery of the Dispute Notice, then subject to Section 13.4 and Section 13.5, such Dispute shall be resolved, at the request of any Party, by final and binding arbitration as follows:

(a) The arbitration shall be administered by JAMS pursuant to its Comprehensive Arbitration Rules and Procedures in effect at the time (the "**Rules**"), except as modified herein.

(b) The seat of arbitration shall be San Francisco, California.

(c) The Parties shall select a mutually agreeable arbitrator who has no affiliation or pre-existing relationship with either Party. If the Parties cannot agree on an arbitrator within [***] referred in Section 13.3, either Party may request JAMS to appoint an arbitrator on behalf of the Parties in accordance with the Rules.

(d) The arbitrator may decide any issue as to whether, or as to the extent to which, any Dispute is subject to the arbitration and other dispute resolution provisions in this Agreement.

(e) The arbitrator must base the award on the provisions of this Agreement and applicable law and must render the award in a writing which must include an explanation of the reasons for such award.

(f) Judgment upon the award rendered by the arbitrator may be entered by any court having jurisdiction over any Party or any of its assets.

(g) The arbitrator's fees and expenses shall be shared equally by the Parties, unless the arbitrator in the award assesses such fees and expenses against one of the Parties or allocates such fees and expenses other than equally between the Parties. Each Party shall bear and pay its own expenses incurred in connection with any Dispute resolution under this Section 13.3.

(h) Notwithstanding the foregoing, either Party shall have the right, without waiving any right or remedy available to such Party under this Agreement or otherwise, to seek and obtain from any court of competent jurisdiction any interim or provisional relief that is necessary or desirable to protect the rights or property of such Party, pending the selection of the arbitrator hereunder or pending the arbitrator's decision of the dispute subject to arbitration. Without prejudice to such provisional remedies that may be granted by a court, the arbitrator shall have full authority to grant provisional remedies, to order a Party to request that a court modify or vacate any temporary or preliminary relief issued by such court, and to award damages for the failure of any party to respect orders to that effect.

(i) In addition to monetary damages, the arbitrator shall be empowered to award equitable relief, including, but not limited to an injunction and specific performance of any obligation under this Agreement.

(j) The arbitration and this arbitration agreement shall be governed by the Federal Arbitration Act (9 U.S.C. § 1 et seq.).

(k) Any arbitration hereunder shall be confidential and, except as may be required by law or to pursue a legal right, the Parties agree not to disclose the existence, content, or results of any arbitration hereunder without the prior written consent of both Parties.

Section 13.4Notwithstanding Section 13.3, any dispute, controversy or claim relating to the scope, validity, enforceability or infringement of any Patent or trademark may be brought in any court of competent jurisdiction.

Section 13.5In the event a Party disputes in good faith whether it is in breach of this Agreement and so notifies the other Party in writing prior to the expiration of the applicable cure period set forth in Section 12.4 above, the cure period shall be tolled from the date of such notice. Promptly following the initiation of a proceeding under Section 13.3 above with respect to such dispute, the arbitrator shall make a determination as to whether there is a good faith dispute as to the existence of a material breach of this Agreement. If the arbitrator determines that there is no good faith dispute by the breaching Party as to the existence of a material breach of this Agreement, then the Agreement shall be deemed terminated, unless the breach is cured within the remainder (if any) of

the cure period set forth in Section 12.4 (after giving effect to the tolling of such cure period up to the date of such determination). If the arbitrator determines that there is a good faith dispute as to the existence of a material breach of this Agreement, the non-breaching Party shall not have the right to terminate this Agreement unless and until it has been finally determined in accordance with Section 13.3 above that a breach actually occurred, and the breaching Party fails to cure such breach within [***] after such final determination (or such longer period as the arbitrator may specify).

ARTICLE XIV
MISCELLANEOUS

Section 14.1Effective Date.

(a) Notwithstanding anything in this Agreement to the contrary, this Agreement shall not become effective until the Effective Date, and upon the Effective Date, the full Agreement and all its terms and provisions shall be automatically effective and binding on both Parties.

(b) Termination Prior to Effective Date. For clarity, prior to the Effective Date, the transactions contemplated by this Agreement shall terminate (and, for clarity this Agreement shall no longer become effective at any time) (i) upon expiration of the Option Period (as defined in the Option Agreement), in the event that Vaxcyte does not exercise the Option, (ii) if Sutro terminates the Option pursuant to and in accordance with Section 7(b) of the Option Agreement (and, for clarity, Vaxcyte does not exercise the Option during the Termination Notice Period (as defined in the Option Agreement) pursuant to and in accordance with Section 7(b) of the Option Agreement), (iii) if the Option Agreement is terminated pursuant to Section 11(i) of the Option Agreement prior to Vaxcyte's exercise of the Option, or (iv) if the Option Agreement is terminated pursuant to Section 11(ii) of the Option Agreement. In the event the transactions contemplated by this Agreement terminate as set forth in this Section 14.1(b), neither Party hereto shall have any obligation hereunder to the other Party in connection with such termination.

Section 14.2Treatment of Existing Agreements. The Existing Agreements are hereby, as of the Effective Date, amended and modified, and shall be deemed so amended and modified, to the extent necessary to remove any restrictions on Vaxcyte's rights to exercise the Manufacturing Rights (and to otherwise permit the transactions contemplated by this Agreement, afford each Party the rights and benefits provided for in this Agreement, and make the Existing Agreements consistent with the transactions contemplated by the Option Agreement and this Agreement). Without limiting the generality of the foregoing, (A) the License Agreement is hereby, as of the Effective Date, amended and modified as set forth in **Schedule 2**, (B) the Supply Agreement is hereby, as of the Effective Date, amended and modified as set forth in **Schedule 3**, (C) the [***] Term Sheet is hereby, as of the Effective Date, amended and modified as set forth in **Schedule 4**, and (D) Vaxcyte is not required to purchase any or all of its requirements of Extract from Sutro during the Term of this Agreement. Except to the extent modified or amended by this Agreement, the terms and conditions of the Existing Agreements shall continue in full force and effect.

Section 14.3Entire Agreement. This Agreement, including the Schedules hereto (which are hereby incorporated herein), together with the Existing Agreements (as amended or modified by this Agreement), the Option Agreement, the [***] Letter Agreement and the [***] Letter of Intent,

as amended, constitute the entire agreement and understanding among the Parties with respect to the subject matter hereof and supersedes all prior agreements and understandings, both oral and written, relating to such subject matter. In the event of any conflict between the terms and conditions of this Agreement and the terms and conditions of the Existing Agreements, the [***] Letter Agreement, the [***] Letter of Intent or the Option Agreement, the terms and conditions of this Agreement shall prevail (except that the terms of the Option Agreement shall prevail with respect to Vaxcyte's right to exercise the Option or any payment obligations by Vaxcyte under the Option Agreement). Neither Party shall be liable or bound to the other Party in any manner by any representations, warranties or covenants relating to such subject matter except as specifically set forth herein and none shall be deemed to exist or be inferred with respect to the subject matter hereof.

Section 14.4Counterparts. This Agreement may be executed (including by electronic signature) in two or more counterparts, all of which shall be considered an original, with the same effect as if the signatures thereto and hereto were upon the same instrument, and shall become effective when one or more such counterparts have been signed by each Party and delivered (by facsimile, email or otherwise) to the other Party.

Section 14.5Notices. All notices, requests, claims, demands and other communications under this Agreement, as between the Parties, shall be in writing and shall be given or made (and shall be deemed to have been duly given or made upon receipt unless the day of receipt is not a business day, in which case it shall be deemed to have been duly given or made on the next business day) by delivery in person, by overnight courier service, by electronic e-mail with receipt confirmed (followed by delivery of an original via overnight courier service) or by registered or certified mail (postage prepaid, return receipt requested) to the respective Parties at the following addresses (or at such other address for a Party as shall be specified in a notice given in accordance with this Section 14.5); provided, that any such notice relating to termination of this Agreement shall prominently state that failure to take the actions identified in such notice shall result in termination of this Agreement (and shall identify the applicable time periods therefor):

If to Vaxcyte:

Vaxcyte, Inc.
825 Industrial Road, Suite 300
San Carlos, California 94070
Attn: Grant Pickering, Chief Executive Officer
(with a copy to Mikhail Eydelman, General Counsel)
Email: [***]
(with a copy to [***])

If to Sutro:

Sutro Biopharma, Inc.
111 Oyster Point Boulevard
South San Francisco, California 94080
Attn: General Counsel
Email: [***]

Section 14.6Amendment and Waivers. Any provision of this Agreement may be amended or waived if, but only if, such amendment or waiver is in writing and is signed, in the case of an amendment, by each Party to this Agreement or, in the case of a waiver, by each Party against whom the waiver is to be effective. The waiver by either Party of any right hereunder, any failure or delay of the other Party to perform, or any breach by the other Party, shall not be deemed a waiver of any other right of such Party hereunder or of any other failure, delay or breach by such other Party whether of a similar nature or otherwise. The rights and remedies provided in this Agreement shall be cumulative and not exclusive of any rights or remedies provided by applicable law.

Section 14.7Assignment. This Agreement shall not be assigned or transferred, in whole or in part, by operation of law or otherwise, by either Party, without the prior written consent of the other Party (which consent shall not be unreasonably withheld, conditioned or delayed); provided, that such first Party, without the other Party's consent, shall be permitted to assign or transfer this Agreement (and any rights or licenses granted hereunder), in whole or in part, by operation of law or otherwise to: (A) one or more of its Affiliates, or (B) the successor to all or substantially all of the business or assets of such first Party to which this Agreement relates (whether by sale, merger, operation of law or otherwise). Any attempted assignment or transfer in violation of this Section 14.7 (without the written consent of the other Party) shall be null and void.

Section 14.8Change of Control.

(a) Notwithstanding anything to the contrary in this Agreement, nothing in this Agreement shall prohibit (and this Agreement does not include any termination or consent right for either Party in respect of) a Change of Control of the other Party ("**Change of Control Party**"), nor will it impose any obligations on the Change of Control Party as a result of such Change of Control other than as set forth herein. As used herein, "**Acquirer**" means the Third Party involved in such Change of Control, and any Affiliate of such Third Party that was not an Affiliate of the acquired Party immediately prior to such Change of Control.

(b) In the event of a Change of Control of Sutro, (A) Patents, know-how and other intellectual property that were controlled by the Acquirer prior to such Change of Control shall not, for purposes of this Agreement (including the grant of the Manufacturing Rights and any Tech Transfer), be included within the Sutro Patents, Sutro Know-How or Sutro Core Know-How (including, for clarity, information to be provided to Vaxcyte pursuant to a Tech Transfer), and (B) Patents, know-how and other intellectual property that, following such Change of Control, are developed, made or otherwise acquired or controlled by the Acquirer without material use of proprietary know-how of Sutro or its Affiliates (including Sutro Know-How and Sutro Core Know-How), or Vaxcyte's Discloser's Information, shall not, for purposes of this Agreement (including the grant of the Manufacturing Rights and any Tech Transfer), be included within the Sutro Patents, Sutro Know-How or Sutro Core Know-How (including, for clarity, information to be provided to Vaxcyte pursuant to a Tech Transfer).

(c) In the event of a Change of Control of Vaxcyte, (A) Patents, know-how and other intellectual property that were controlled by the Acquirer prior to such Change of Control shall not, for purposes of this Agreement, be included within the Jointly-Owned IP or the [***] IP, and (B) Patents, know-how and other intellectual property that, following such Change of Control, are

developed, made or otherwise acquired or controlled by the Acquirer without material use of proprietary know-how of Vaxcyte, or Sutro's Discloser's Information, shall not, for purposes of this Agreement, be included within the Jointly-Owned IP or the [***] IP. To the extent the Acquirer does not use or exploit Segregated Technology pertaining to Extracts or rights licensed to Vaxcyte under this Agreement, Section 2.2 shall not apply to such Acquirer. For clarity, Section 2.2 shall apply to an Acquirer of Vaxcyte only with respect to activities of the Acquirer involving the use of Segregated Technology of Vaxcyte or rights licensed to Vaxcyte under this Agreement.

(d) Notwithstanding anything to the contrary in this Section 14.8, if rights to Segregated Technology were granted to the Acquirer prior to the Change of Control, then the use of such Segregated Technology in accordance with such grant (and consistent with the licenses granted under this Agreement) shall not be deemed use of Segregated Technology in violation of this Section 14.8. "**Segregated Technology**" means, with respect to Section 14.8(b)(B) and Section 14.8(c)(B), such proprietary know-how of the Acquired Party and confidential Discloser's Information of the other Party, respectively.

Section 14.9 Successors and Assigns. The provisions of this Agreement and the obligations and rights hereunder shall be binding upon, inure to the benefit of and be enforceable by (and against) the Parties and their respective successors and permitted transferees and assigns.

Section 14.10 Title and Headings; Interpretation. Titles and headings to sections herein are inserted for the convenience of reference only and are not intended to be a part of or to affect the meaning or interpretation of this Agreement. Except where expressly stated otherwise in this Agreement, the following rules of interpretation apply to this Agreement: (a) "include," "includes" and "including" are not limiting and mean include, includes and including, without limitation; (b) definitions contained in this Agreement are applicable to the singular as well as the plural forms of such terms; (c) references to an agreement, statute or instrument mean such agreement, statute or instrument as from time to time amended, modified or supplemented; (d) references to a person or entity are also to its permitted successors and assigns; (e) references to a "Section" or "Schedule" refer to a Section of, or a Schedule to, this Agreement unless otherwise indicated; (f) the word "will" shall be construed to have the same meaning and effect as the word "shall"; (g) the word "any" shall mean "any and all" unless otherwise indicated by context; (h) a reference to a particular law or regulation is a reference to it as amended, extended or re-enacted from time to time and includes any subordinate legislation made from time to time under that legislation or legislative provision; and (i) nothing in this Agreement shall in any way restrict or limit any obligation of either Party to mitigate any loss or damage they may suffer in consequence of any breach by the other Party of the terms of this Agreement, in consequence of any matter giving rise to a claim against the other Party or otherwise in connection with this agreement.

Section 14.11 Governing Law; Dispute Resolution; Waiver of Jury Trial. This Agreement shall be governed by, and construed and enforced in accordance with, the laws of the State of Delaware, without regard to any choice or conflict of law provision or rule (whether of the State of Delaware or any other jurisdiction) that would cause the application of the laws of any jurisdiction other than the State of Delaware. EACH PARTY ACKNOWLEDGES AND AGREES THAT ANY CONTROVERSY WHICH MAY ARISE UNDER THIS AGREEMENT IS LIKELY TO INVOLVE COMPLICATED AND DIFFICULT ISSUES, AND THEREFORE EACH SUCH PARTY HEREBY IRREVOCABLY AND UNCONDITIONALLY WAIVES, AND SHALL

NOT SEEK, TRIAL BY JURY IN ANY ACTION, PROCEEDING OR COUNTERCLAIM BROUGHT BY ANY PARTY AGAINST ANY OTHER PARTY ARISING OUT OF OR IN ANY WAY CONNECTED WITH THIS AGREEMENT OR THE OTHER TRANSACTIONS CONTEMPLATED HEREIN.

Section 14.12Severability. If any term or provision of this Agreement is held to be illegal, invalid or unenforceable under any present or future law, such provision shall be enforced to the maximum extent permitted under applicable law and the Parties' fundamental intentions hereunder, and the remaining provisions of this Agreement, will remain in full force and effect and will not be affected or impaired by the illegal, invalid or unenforceable provision or by its severance from this Agreement.

Section 14.13No Duplication; No Double Recovery. Nothing in this Agreement is intended to confer to or impose upon any Party a duplicative right, entitlement, obligation or recovery (whether under any other agreement or applicable law) with respect to any matter arising out of the same facts and circumstances.

Section 14.14Independent Parties. Nothing in this Agreement is intended (or shall be deemed) to constitute a joint venture agreement and, except as expressly set forth herein, nothing herein shall constitute any Party as a partner, principal or agent of any other, this being an Agreement between independent contracting entities. Except as expressly set forth herein, no Party shall have the authority to bind any other in any respect whatsoever to Third Parties. Except as provided herein, nothing contained in this Agreement shall be construed as conferring any right on any Party to use any name, trade name, trademark or other designation of any other Party hereto, unless the express, written permission of such other Party has been obtained.

Section 14.15Negotiated Agreement. This Agreement has been submitted to the scrutiny of, and has been negotiated by, both Parties and their counsel, and shall be given a fair and reasonable interpretation in accordance with its terms, without consideration or weight being given to any such term's having been drafted by any Party or its counsel.

Section 14.16Further Assurances. Each Party shall take any and all additional actions (and execute and deliver such additional documents and instruments) as may be reasonably requested by the other Party to more fully effect and implement the transactions contemplated by this Agreement.

Section 14.17Bankruptcy. The Parties acknowledge and agree that all rights and licenses now or hereafter granted under or pursuant to any provision of this Agreement are rights to "intellectual property" as defined in Section 101(35A) of Title 11 of the United States Code. In the event that a case under Title 11 is commenced by or against either Party, the other Party may elect to retain and may fully exercise all of its rights and elections under Section 365(n) of Title 11 of the United States Code.

Section 14.18Publications. In the event that either Party (the "**Announcing Party**") proposes to make any public announcement or press release regarding this Agreement or the transactions contemplated hereby, such Announcing Party shall first provide the other Party with an advance copy of each proposed publication or press release at least [***] prior to its proposed date of

publication. The Announcing Party shall reasonably consider in good faith any modifications to the publication or press release requested by the other Party. Subject to the foregoing, each Party shall not issue any press release or other public statement, whether oral or written, disclosing the existence of this Agreement, the terms hereof or any other information relating to this Agreement without the prior written consent of the other Party (such consent not to be unreasonably withheld, conditioned or delayed); provided, that neither Party shall be required to obtain the consent of the other Party prior to issuing any press release or other public statement to the extent such press release or other public statement contains information that has already been publicly disclosed by either Party in compliance with this Section 14.18. Notwithstanding anything to the contrary in this Section 14.18, neither Party shall be required to obtain the consent of the other Party to make any disclosures required of it to comply with any duty of disclosure it may have pursuant to applicable law, governmental regulation or the rules of any recognized stock exchange; provided, that the Party to make such required disclosure (A) shall reasonably cooperate with the other Party with respect to the timing, form and content of such required disclosure (including any reasonably requested redactions thereto), and (B) if requested by such other Party, shall use Commercially Reasonable Efforts to obtain an order protecting to the maximum extent reasonably possible the confidentiality of the provisions of this Agreement.

* * * * *

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IN WITNESS WHEREOF, the Parties have caused this Agreement to be duly executed as of the day and year first written above.

VAXCYTE, INC.

By: /s/ Grant E. Pickering_____
Name: Grant E. Pickering
Title: Chief Executive Officer

SUTRO BIOPHARMA, INC.

By: /s/ William J. Newell_____
Name: William J. Newell
Title: Chief Executive Officer

[*Signature Page to Manufacturing Rights Agreement*]

Schedule 1
Tech Transfer Information

[***]

Schedule 2
Amendments to the License Agreement

The Parties acknowledge and agree that the License Agreement is hereby, as of the Effective Date of the Manufacturing Rights Agreement, amended as follows:

1. Section 1.5 of the License Agreement is hereby restated in its entirety as follows:

   1.5 "**Extract**" means any extract derived from strains of E. coli and (i) supplied to Vaxcyte or its Affiliates by or on behalf of Sutro pursuant to this Agreement, the Supply Agreement, the [***] Letter Agreement or any subsequent written agreement between the Parties or their respective Affiliates, or (ii) made by or on behalf of Vaxcyte or its Affiliates pursuant to the Manufacturing Rights Agreement. For clarity, Extract includes [***] (as defined in the Manufacturing Rights Agreement).

2. The following shall be inserted as Section 1.3A of the License Agreement:

   1.3A "**CMO**" means any Third Party contract manufacturing organization.

3. Section 1.22 of the License Agreement is hereby restated in its entirety as follows:

   1.22 " **Sutro Know-How**" means all information and materials pertaining to the Extracts or Vaccine Compositions, or the manufacture, use or, in the case of Vaccine Compositions, development thereof, as the case may be, that are owned or controlled by Sutro or (subject to Section 15.2) its Affiliates at any time during the Term of this Agreement, including (i) practices, protocols, methods, techniques, specifications, formulae, standard operating procedures, analytical methods, material and vendor lists, (ii) analytical, quality control and stability data, batch records, and other chemistry, manufacturing and control (CMC) data, (iii) regulatory documentation, and (iv) tangible materials and reagents; in each case as and to the extent reasonably necessary or useful for Vaxcyte to exercise the rights granted to it under this Agreement, the Manufacturing Rights Agreement (during the Term thereof) or any other written agreement between the Parties or their respective Affiliates (during the Term thereof). Notwithstanding the foregoing, in no event shall Sutro Know-How include any information or materials of Sutro's Third Party collaborators or sublicensees, except for such information or materials pertaining to the Sutro Platform which Sutro has the right to provide to Vaxcyte in accordance with this Agreement.

4. Section 3.1(d) of the License Agreement is hereby restated in its entirety as follows:

   (d) In the event Sutro engages one or more CMOs to manufacture one or more Extract(s) for Sutro, its Affiliates or others (each such Extract, an "**Available Extract**"), Sutro shall promptly notify Vaxcyte.

5. Section 3.3 of the License Agreement is hereby restated in its entirety as follows:

   3.3 **[Intentionally left blank]**

6. Section 4.1(a) of the License Agreement is hereby restated in its entirety as follows:

(a) Subject to the terms of this Agreement, Sutro hereby grants to Vaxcyte an exclusive, royalty-bearing license (subject to Section 6), under the Sutro Patents, [***] IP, Sutro Know-How and Sutro's ownership interest in and to any Jointly-Owned IP, with the right to grant and authorize sublicenses in accordance with Section 4.3 (only with respect to the rights granted under the following sub-clause (i)), solely to (i) research, develop, use, sell, offer for sale, export, import or otherwise exploit Vaccine Compositions, and (ii) to manufacture, itself or through any CMO established or approved by Sutro pursuant to Section 3.2, both cGMP grade and non-cGMP grade Vaccine Compositions from Extracts (x) obtained from Sutro or any CMO established or approved by Sutro as described in Section 3.1, or (y) manufactured by or for Vaxcyte pursuant to Section 15.3(a) or pursuant to the Manufacturing Rights Agreement, in each case in the Territory during the Term in accordance with the terms of the Agreement. For clarity, to the extent a CMO established in accordance with Section 3.2 above utilizes Sutro Patents or Sutro Know-how solely to supply Vaccine Composition to Vaxcyte in accordance with Section 3.2, such arrangement shall not be deemed a sublicense by Vaxcyte. In addition, it is understood and agreed that:

(A) If components of a Vaccine Composition (such as an adjuvant) can be used for purposes other than a Vaccine Composition, the exclusive license under this Section 4.1 shall not be deemed to restrict Sutro from using, licensing or otherwise exploiting such components for such other purposes (i.e., purposes other than to induce an immune response specific to a Vaccine Antigen to treat or prevent the disease against which such Vaccine Antigen is directed by means of such specific immune response); and

(B) If a Vaccine Composition or component thereof can be used for purposes other than those permitted under Section 1.32, such use shall not be deemed licensed under this Section 4.1, but a third party's use or administration of a composition for such an unpermitted use shall not cause such composition to cease being a Vaccine Composition, provided that Vaxcyte uses diligent efforts to prevent such unpermitted use.

7. Section 4.1(b) of the License Agreement is hereby restated in its entirety as follows:

(b) For clarity, without limiting the license granted in Section 15.3, the license granted in Section 4.1(a) does not include the right to manufacture Extracts, and Vaxcyte shall use the Extracts supplied to it by Sutro or a CMO authorized by Sutro, or manufactured by Vaxcyte or an Approved CMO pursuant to the Manufacturing Rights Agreement, solely to express Vaccine Compositions in the Territory solely for use in conjunction with the exercise, and within the scope, of the license granted in Section 4.1(a) (or as otherwise permitted pursuant to the Manufacturing Rights Agreement or any subsequent written agreement between the Parties).

8. Section 4.2 of the License Agreement is hereby restated in its entirety as follows:

4.2 **No Other Uses**. Vaxcyte covenants not to use the Extract except for use in conjunction with the exercise, and within the scope, of the license granted in Section 4.1(a) (or as otherwise permitted pursuant to the Manufacturing Rights Agreement or any other subsequent written agreement between the Parties). Without limiting the foregoing, Vaxcyte shall not [***].

9. Section 8.2 of the License Agreement is hereby restated in its entirety as follows:

8.2 **Mutual Termination for Breach**. If either Party materially breaches any of the material terms, conditions or agreements contained in this Agreement to be kept, observed or performed by it, the other Party may terminate this Agreement, at its option and without prejudice to any of its other legal or equitable rights or remedies, by giving the Party who committed the breach [***] prior written notice, unless the notified Party shall have cured the breach within such [***] period, subject to Section 14.5; provided, that notwithstanding the foregoing, if the Manufacturing Rights Agreement is in effect, Sutro shall not have the right to terminate this Agreement pursuant to this Section 8.2 or otherwise with respect to any provisions of this Agreement, or any breach by Vaxcyte thereof, relating to (a) confidentiality (including Section 10), (b) use of Extract, [***], Sutro Core Know-How or other materials or intellectual property outside of the Vaccine Field, or (c) Section 4.1(b), except, in each case of the foregoing clauses (a)-(c), in the event that [***].

10. Section 8.4(b) of the License Agreement is hereby restated in its entirety as follows:

(b) **[Intentionally left blank]**

11. Article 14 (Communication and Dispute Resolution) of the License Agreement is hereby restated in its entirety as follows:

14.1 Each Party will appoint an individual employed by it to serve as its "**Principal Contact**" for purposes of this Agreement. Either Party may from time to time replace its Principal Contact with a different employee, but unless required due to the termination of the Principal Contact's employment or events beyond the applicable Party's control, neither Party will replace its Principal Contact without at least [***] prior notice to the other Party. The Principal Contacts shall communicate with each other regularly during the Term as the Parties may agree or as the Principal Contacts shall mutually determine to be useful.

14.2 The Parties intend that, to the maximum extent practicable, they shall reach decisions hereunder cooperatively through discussions among the Principal Contacts and by mutual consent of the Parties. In situations in which that does not occur, any disputes, controversies, claims or differences arising out of or in connection with this Agreement or the breach, termination or validity thereof, and any question of the arbitral tribunal's jurisdiction or the existence, scope or validity of these arbitration provisions or the arbitrability of any claim (each a "Dispute") shall initially be referred for review by delivery of a written notice (a "Dispute

Notice") by either Party's Principal Contact to each of the Parties' respective Senior Managements (as defined below). Such Senior Managements shall discuss the Dispute, and shall meet with respect thereto if either of them believes a meeting or meetings are likely to be useful. As used herein, Sutro's "Senior Management" means [***], and Vaxcyte's "Senior Management" means [***].

14.3 If the Senior Managements are not able to resolve such Dispute referred to them under Section 14.2 within [***] from the date of delivery of the Dispute Notice, then subject to Section 14.4 and Section 14.5, such Dispute shall be resolved, at the request of any Party, by final and binding arbitration as follows:

(a) The arbitration shall be administered by JAMS pursuant to its Comprehensive Arbitration Rules and Procedures in effect at the time (the "**Rules**"), except as modified herein.

(b) The seat of arbitration shall be San Francisco, California.

(c) The Parties shall select a mutually agreeable arbitrator who has no affiliation or pre-existing relationship with either Party. If the Parties cannot agree on an arbitrator within [***] referred in Section 14.3, either Party may request JAMS to appoint an arbitrator on behalf of the Parties in accordance with the Rules.

(d) The arbitrator may decide any issue as to whether, or as to the extent to which, any Dispute is subject to the arbitration and other dispute resolution provisions in this Agreement.

(e) The arbitrator must base the award on the provisions of this Agreement and applicable law and must render the award in a writing which must include an explanation of the reasons for such award.

(f) Judgment upon the award rendered by the arbitrator may be entered by any court having jurisdiction over any Party or any of its assets.

(g) The arbitrator's fees and expenses shall be shared equally by the Parties, unless the arbitrator in the award assesses such fees and expenses against one of the Parties or allocates such fees and expenses other than equally between the Parties. Each Party shall bear and pay its own expenses incurred in connection with any Dispute resolution under this Section 14.3.

(h) Notwithstanding the foregoing, either Party shall have the right, without waiving any right or remedy available to such Party under this Agreement or otherwise, to seek and obtain from any court of competent jurisdiction any interim or provisional relief that is necessary or desirable to protect the rights or property of such Party, pending the selection of the arbitrator hereunder or pending the arbitrator's decision of the dispute subject to arbitration. Without prejudice to such provisional remedies that may be granted by a court, the arbitrator shall have full authority to grant

provisional remedies, to order a Party to request that a court modify or vacate any temporary or preliminary relief issued by such court, and to award damages for the failure of any party to respect orders to that effect.

(i) In addition to monetary damages, the arbitrator shall be empowered to award equitable relief, including, but not limited to an injunction and specific performance of any obligation under this Agreement.

(j) The arbitration and this arbitration agreement shall be governed by the Federal Arbitration Act (9 U.S.C. § 1 et seq.).

(k) Any arbitration hereunder shall be confidential and, except as may be required by law or to pursue a legal right, the Parties agree not to disclose the existence, content, or results of any arbitration hereunder without the prior written consent of both Parties.

14.4 Notwithstanding Section 14.3, any dispute, controversy or claim relating to the scope, validity, enforceability or infringement of any Patent or trademark may be brought in any court of competent jurisdiction.

14.5 In the event a Party disputes in good faith whether it is in breach of this Agreement and so notifies the other Party in writing prior to the expiration of the applicable cure period set forth in Section 8.4 above, the cure period shall be tolled from the date of such notice. Promptly following the initiation of a proceeding under Section 14.3 above with respect to such dispute, the arbitrator shall make a determination as to whether there is a good faith dispute as to the existence of a material breach of this Agreement. If the arbitrator determines that there is no good faith dispute by the breaching Party as to the existence of a material breach of this Agreement, then the Agreement shall be deemed terminated, unless the breach is cured within the remainder (if any) of the cure period set forth in Section 8.4 (after giving effect to the tolling of such cure period up to the date of such determination). If the arbitrator determines that there is a good faith dispute as to the existence of a material breach of this Agreement, the non-breaching Party shall not have the right to terminate this Agreement unless and until it has been finally determined in accordance with Section 14.3 above that a breach actually occurred, and the breaching Party fails to cure such breach within [***] after such final determination (or such longer period as the arbitrator may specify).

Schedule 3
Amendments to the Supply Agreement

Subject to the terms and conditions of the Agreement, the Supply Agreement is hereby, as of the Effective Date of the Manufacturing Rights Agreement, amended as follows:

1. All references in the Supply Agreement to "SutroVax" are replaced with "Vaxcyte."

2. Section 2.18 of the Supply Agreement is hereby restated in its entirety as follows:

> 2.18 **Sutro Core Know-How**. Notwithstanding anything herein to the contrary, except as set forth in Section 15.3 of the License Agreement, the [***] Letter Agreement, the Manufacturing Rights Agreement or any other subsequent written agreement between the Parties or their Affiliates, in no event shall Vaxcyte, its Affiliates or Sublicensees have the right to access any Sutro Core Know-How (as defined in the License Agreement), whether directly from Sutro or its Affiliates or through a CMO or otherwise. Without limiting the foregoing, in the event any item of Sutro Core Know-How is delivered to Vaxcyte, its Affiliates and/or its Sublicensees (except as set forth in, or in connection with, Section 15.3 of the License Agreement, the [***] Letter Agreement, the Manufacturing Rights Agreement or any other subsequent written agreement between the Parties or their Affiliates), Vaxcyte, its Affiliates and Sublicensees shall immediately return such item to Sutro. For purposes of this Agreement, (a) the "**[***] Letter Agreement**" [***], and (b) the "**Manufacturing Rights Agreement**" means that certain Manufacturing Rights Agreement, entered into by and between Vaxcyte and Sutro.

3. Section 2.20 of the Supply Agreement is hereby restated in its entirety as follows:

> 2.20 Vaxcyte agrees to purchase all its requirements of Extract from Sutro in accordance with this Agreement, except to the extent Vaxcyte is allowed to (1) purchase Extract from (a) Alternate Suppliers engaged by Sutro in accordance with Section 2.15 of this Agreement; (b) a CMO engaged or established and authorized by Sutro under Section 3.1(d) of the License Agreement; (c) a CMO authorized by Sutro under Section 3.1(e) of the License Agreement; or (d) [***] pursuant to the [***] Letter Agreement, or (2) manufacture and supply (itself or through an Approved CMO (as defined in the Manufacturing Rights Agreement)) Extract in accordance with the Manufacturing Rights Agreement. Manufacturing of Extracts in breach of this Section 2.20 shall be deemed a material breach of this Agreement and the License Agreement by Vaxcyte.

Schedule 4
Amendments to the [***] Term Sheet

[***]

Exhibit 10.21

AMENDMENT NO. 1 TO THE LICENSE
AGREEMENT
BETWEEN COLUMBIA SUTROVAX, INC. AND THE REGENTS OF THE
UNIVERSITY OF CALIFORNIA
FOR UCSD CASE NO. SD2012-011

This first amendment to the License Agreement ("Amendment No. 1") is made by and between Sutrovax, Inc., having an address at 353 Hatch Drive, Foster City, California 94404 ("LICENSEE") and The Regents of the University of California, a California corporation having its administrative offices at 1111 Franklin Street, Oakland, California 94607 ("UNIVERSITY"), as represented by its San Diego campus having an address at University of California San Diego, Office of Innovation and Commercialization, Mail Code 0910, 9500 Gilman Drive, La Jolla, California 92093.

The Amendment is effective as of the date of the last signature below ("Amendment No. 1 Effective Date").

Whereas LICENSEE entered into a license agreement ("License Agreement") with the UNIVERSITY effective February 4, 2019 (UC Control Number 2019-03-0329) wherein LICENSEE was granted certain rights;

WHEREAS, LICENSEE and UNIVERSITY now desire to make certain changes to the Agreement as specified below.

NOW THEREFORE, in consideration of the covenants and conditions contained herein, the parties hereto agree as follows:

ARTICLE 1. DEFINITIONS

The following definition shall be added:

1.14 "Third Party Contractors" means third parties who agree, in writing, to be bound by the terms and conditions at least as restrictive as this Agreement for the purpose of performing work under fee-for-service arrangement on behalf of LICENSEE within the Field and during the Tern.

Unless otherwise defined under this Amendment No. 1, capitalized terms shall have the meaning assigned to them in the License Agreement. Except as expressly and unambiguously stated herein, no other changes are made to the License Agreement. All other terms and conditions of the License Agreement shall remain in full force and effect. The License Agreement, and this Amendment No. 1 constitute the entire understanding of the parties with respect to the subject matter hereof and supersede any prior understanding, oral or written, between the parties with respect thereto, The Agreement and these Amendments shall be governed in all respects by the laws of the State of California without regard to its conflict of laws provisions.

The parties agree that this Amendment No. 1 may be executed in one (1) or more counterparts, each of which shall together shall constitute but one and the same instrument. For purposes of executing this Amendment No. 1, a facsimile (including a PDF image delivered via email) copy of this Amendment No. 1, including the signature pages, will be deemed an original.

SUTROVAX, INC:

By:	/s/ Grant E. Pickering
Name:	Grant E. Pickering
Title:	President and CEO
Date:	August 16, 2019

THE REGENTS OF THE UNIVERSITY OF CALIFORNIA

By:	/s/ David Gibbons
Name:	David Gibbons
Title:	Associate Director
Date:	August 16, 2019

Exhibit 10.23

FIRST AMENDMENT TO LEASE

THIS FIRST AMENDMENT TO LEASE (this "**First Amendment**") is made as of October 17, 2023, and effective as of January 1, 2023 (the "**Effective Date**"), by and between **ARE-SAN FRANCISCO NO. 63, LLC**, a Delaware limited liability company ("**Landlord**"), and **VAXCYTE, INC.**, a Delaware corporation ("**Tenant**").

RECITALS

A. Landlord and Tenant are parties to that certain Lease Agreement dated as of January 21, 2021 (the "**Lease**"). Pursuant to the Lease, Tenant leases certain premises consisting of approximately 77,734 rentable square feet (the "**Premises**"), in that certain building located at 825 Industrial Road, San Carlos, California (the "**Building**"), comprised of (i) approximately 27,776 rentable square feet on the second floor of the Building, commonly known as Suite 200A, and (ii) approximately 49,958 rentable square feet on the third floor of the Building, commonly known as Suite 300. The Premises are more particularly described in the Lease. Capitalized terms used herein without definition shall have the meanings defined for such terms in the Lease.

B. Prior to the date hereof, Landlord caused the Building to be re-measured and pursuant to such re-measurement, the rentable square footages of the Building and the Project have been modified.

C. Landlord and Tenant desire, subject to the terms and conditions set forth below, to amend the Lease to, among other things, revise the rentable square footages of the Building and the Project to reflect the modified rentable square footages resulting from the re-measurement.

NOW, THEREFORE, in consideration of the foregoing Recitals, which are incorporated herein by this reference, the mutual promises and conditions contained herein, and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Landlord and Tenant hereby agree as follows:

1. **Defined Terms**. Commencing on the Effective Date, the defined terms "**Premises**," "**Rentable Area of Premises**," "**Rentable Area of Building**," "**Rentable Area of Project**," "**Tenant's Share of Operating Expenses of Building**," and "**Building's Share of Project**," which are defined in the Original Lease, shall be deleted in their entirety and replaced with the following:

"**Premises:** A portion of the Building containing approximately 77,498 rentable square feet, consisting of (i) a portion of the 2nd floor of the Building, commonly known as Suite 200A, containing 27,691 rentable square feet, and (ii) the entire 3rd floor of the Building, commonly known as Suite 300, containing approximately 49,807 rentable square feet, as determined by Landlord, as shown on **Exhibit A**."

"**Rentable Area of Premises:** 77,498 sq. ft."

"**Rentable Area of Building:** 274,626 sq. ft."

"**Rentable Area of Project:** 522,729 sq. ft."

"**Tenant's Share of Operating Expenses of Building:** 28.22%"

"**Building's Share of Project:** 52.54% sq. ft."

Landlord and Tenant agree that the rentable square footages of the Premises, the Building and the Project are as stated in this First Amendment for all purposes under the Lease, and none of the Premises, the Building nor the Project shall be subject to further re-measurement except for physical changes to the physical size of the Premises, the Building or the Project, as applicable.

2. **California Accessibility Disclosure**. The provisions of Section 41(p) of the Lease are hereby incorporated herein.

3. **Brokers**. Landlord and Tenant each represents and warrants that it has not dealt with any broker, agent or other person (collectively, "**Broker**") in connection with the transaction reflected in this First Amendment and that no Broker brought about this transaction. Landlord hereby agrees to indemnify and hold Tenant harmless and Tenant hereby agrees to indemnify and hold Landlord harmless from and against any claims by any Broker claiming a commission or other form of compensation by virtue of having dealt with Tenant or Landlord, as applicable, with regard to this First Amendment.

4. **OFAC**. Tenant is currently (a) in compliance with and shall at all times during the Term of the Lease remain in compliance with the regulations of the Office of Foreign Assets Control ("**OFAC**") of the U.S. Department of Treasury and any statute, executive order, or regulation relating thereto (collectively, the "**OFAC Rules**"), (b) not listed on, and shall not during the Term of the Lease be listed on, the Specially Designated Nationals and Blocked Persons List, Foreign Sanctions Evaders List or the Sectoral Sanctions Identifications List, which are all maintained by OFAC and/or on any other similar list maintained by OFAC or other governmental authority pursuant to any authorizing statute, executive order, or regulation, and (c) not a person or entity with whom a U.S. person is prohibited from conducting business under the OFAC Rules.

5. **Miscellaneous**.

a. This First Amendment is the entire agreement between the parties with respect to the subject matter hereof and supersedes all prior and contemporaneous oral and written agreements and discussions. This First Amendment may be amended only by an agreement in writing, signed by the parties hereto.

b. This First Amendment is binding upon and shall inure to the benefit of the parties hereto, and their respective successors and assigns.

c. Tenant acknowledges that Landlord's business operations are proprietary to Landlord. Absent prior written consent from Landlord, Tenant shall hold confidential and will not disclose to third parties, and shall require Tenant Parties to hold confidential and not disclose to third parties, information concerning Landlord's business operations, including but not limited to information regarding the systems, controls, equipment, programming, vendors, tenants, and specialized amenities of Landlord.

d. This First Amendment may be executed in 2 or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument. Counterparts may be delivered via facsimile, electronic mail (including pdf or any electronic signature process complying with the U.S. federal ESIGN Act of 2000) or other transmission method and any counterpart so delivered shall be deemed to have been duly and validly delivered and be valid and effective for all purposes. Electronic signatures shall be deemed original signatures for purposes of this First Amendment and all matters related thereto, with such electronic signatures having the same legal effect as original signatures.

e. Except as amended and/or modified by this First Amendment, the Lease is hereby ratified and confirmed and all other terms of the Lease shall remain in full force and effect, unaltered and unchanged by this First Amendment. In the event of any conflict between the provisions of this First Amendment and the provisions of the Lease, the provisions of this First Amendment shall prevail.

[Signatures are on the next page]

IN WITNESS WHEREOF, the parties hereto have executed this First Amendment as of the day and year first above written.

TENANT:

VAXCYTE, INC.,
a Delaware corporation

By: /s/ Grant Pickering
Its: CEO

☒ I hereby certify that the signature, name, and title above are my signature, name and title.

LANDLORD:

ARE-SAN FRANCISCO NO. 63, LLC,
a Delaware limited liability company

By: ALEXANDRIA REAL ESTATE EQUITIES, L.P.,
a Delaware limited partnership,
managing member

By: ARE-QRS CORP.,
a Maryland corporation,
general partner

By: /s/ Kristen Childs
Its: Vice President – Real Estate

EXHIBIT 10.26

VAXCYTE, INC.
STOCK OPTION GRANT NOTICE – NON-U.S.
(2020 EQUITY INCENTIVE PLAN)

Vaxcyte, Inc. (the "***Company***"), pursuant to its 2020 Equity Incentive Plan (the "***Plan***"), has granted to you ("***Optionholder")*** an option to purchase the number of shares of the Common Stock set forth below (the "***Option***"). Your Option is subject to all of the terms and conditions as set forth herein and in the Plan, and the Stock Option Agreement (the definition of which shall include any special terms and conditions for your country of residence and/or work set forth in the appendix attached hereto (the "***Appendix***")) and the Notice of Exercise, all of which are attached hereto and incorporated herein in their entirety. Capitalized terms not explicitly defined herein but defined in the Plan or the Stock Option Agreement shall have the meanings set forth in the Plan or the Stock Option Agreement, as applicable.

Optionholder:	_____
Date of Grant:	_____
Vesting Commencement Date:	_____
Number of Shares of Common Stock Subject to Option:	_____
Exercise Price (Per Share) (US$):	_____
Total Exercise Price (US$):	_____
Expiration Date:	_____

Type of Grant: Nonstatutory Stock Option

Exercise and Vesting Schedule: Subject to the Optionholder's Continuous Service through each applicable vesting date, the Option will vest as follows:

[_____]

Optionholder Acknowledgements: By your signature below or by electronic acceptance or authentication in a form authorized by the Company, you understand and agree that:

- The Option is governed by this Stock Option Grant Notice, and the provisions of the Plan and the Stock Option Agreement and the Notice of Exercise, all of which are made a part of this document. Unless otherwise provided in the Plan, this Grant Notice and the Stock Option Agreement (together, the "***Option Agreement***") may not be modified, amended or revised except in a writing signed by you and a duly authorized officer of the Company.
- You consent to receive this Grant Notice, the Stock Option Agreement, the Plan, the Prospectus and any other Plan-related documents by electronic delivery and to participate in the Plan through an on-line or electronic system established and maintained by the Company or another third party designated by the Company.
- You have read and are familiar with the provisions of the Plan, the Stock Option Agreement, the Notice of Exercise and the Prospectus. In the event of any conflict between the provisions in this Grant Notice, the Option Agreement, the Notice of Exercise, or the Prospectus and the terms of the Plan, the terms of the Plan shall control except as expressly amended or overridden in the Stock Option Agreement.

- The Option Agreement sets forth the entire understanding between you and the Company regarding the acquisition of Common Stock and supersedes all prior oral and written agreements, promises and/or representations on that subject with the exception of other equity awards previously granted to you and any written employment agreement, offer letter, severance agreement, written severance plan or policy, or other written agreement between the Company and you in each case that specifies the terms that should govern this Option.
- Counterparts may be delivered via facsimile, electronic mail (including pdf or any electronic signature complying with the U.S. federal ESIGN Act of 2000, Uniform Electronic Transactions Act or other applicable law) or other transmission method and any counterpart so delivered will be deemed to have been duly and validly delivered and be valid and effective for all purposes.

VAXCYTE, INC.

By:_____
Signature

Title:_____

Date:_____

OPTIONHOLDER:

_____
Signature

Date:_____

VAXCYTE, INC.
2020 EQUITY INCENTIVE PLAN

STOCK OPTION AGREEMENT – NON-U.S.

As reflected by your Stock Option Grant Notice ("***Grant Notice***") Vaxcyte, Inc. (the "***Company***") has granted you an option under its 2020 Equity Incentive Plan (the "***Plan***") to purchase a number of shares of Common Stock at the exercise price indicated in your Grant Notice (the "***Option***"). Capitalized terms not explicitly defined in this Agreement but defined in the Grant Notice or the Plan shall have the meanings set forth in the Grant Notice or Plan, as applicable. The terms of your Option as specified in the Grant Notice and this Stock Option Agreement (the definition of which shall include any special terms and conditions for your country of residence and/or work set forth in the appendix attached hereto (the "***Appendix***")), constitute your Option Agreement.

The general terms and conditions applicable to your Option are as follows:

1. GOVERNING PLAN DOCUMENT. Your Option is subject to all the provisions of the Plan. Your Option is further subject to all interpretations, amendments, rules and regulations, which may from time to time be promulgated and adopted pursuant to the Plan. In the event of any conflict between the Option Agreement and the provisions of the Plan, the provisions of the Plan shall control except as expressly amended or overridden in this Option Agreement.

2. EXERCISE.

(a) You may generally exercise the vested portion of your Option for whole shares of Common Stock at any time during its term by delivery of payment of the exercise price and applicable withholding taxes and social security and other required documentation to the Plan Administrator in accordance with the exercise procedures established by the Plan Administrator, which may include an electronic submission. Please review the Plan, which may restrict or prohibit your ability to exercise your Option during certain periods.

(b) To the extent permitted by Applicable Law, you may pay your Option exercise price as follows:

(i) cash, check, bank draft or money order;

(ii) subject to Company and/or Committee consent at the time of exercise, pursuant to a "cashless exercise" program as further described in the Plan if at the time of exercise the Common Stock is publicly traded;

(iii) subject to Company and/or Committee consent at the time of exercise, by delivery of previously owned shares of Common Stock as further described in the Plan; or

(iv) subject to Company and/or Committee consent at the time of exercise, by a "net exercise" arrangement as further described in the Plan.

3. TERM. You may not exercise your Option before the commencement of its term or after its term expires. The term of your option commences on the Date of Grant and expires upon the earliest of the following:

1.

(a) immediately upon the termination of your Continuous Service for Cause;

(b) three months after the termination of your Continuous Service for any reason other than Cause, Disability or death;

(c) 12 months after the termination of your Continuous Service due to your Disability;

(d) 18 months after your death if you die during your Continuous Service;

(e) immediately upon a Corporate Transaction if the Board has determined that the Option will terminate in connection with a Corporate Transaction,

(f) the Expiration Date indicated in your Grant Notice; or

(g) the day before the 10th anniversary of the Date of Grant.

Notwithstanding the foregoing, if you die during the period provided in Section 3(b) or 3(c) above, the term of your Option shall not expire until the earlier of (i) eighteen months after your death, (ii) upon any termination of the Option in connection with a Corporate Transaction, (iii) the Expiration Date indicated in your Grant Notice, or (iv) the day before the tenth anniversary of the Date of Grant. Additionally, the Post-Termination Exercise Period of your Option may be extended as provided in the Plan.

4. Withholding Obligations. As further provided in the Plan: (a) you may not exercise your Option unless the applicable tax and social security withholding obligations are satisfied, and (b) at the time you exercise your Option, in whole or in part, or at any time thereafter as requested by the Company, you hereby authorize withholding from payroll and any other amounts payable to you, and otherwise agree to make adequate provision for (including by means of a "cashless exercise" pursuant to a program developed under Regulation T as promulgated by the Federal Reserve Board to the extent permitted by the Company), any sums required to satisfy the federal, state, local and foreign tax and social security withholding obligations, if any, which arise in connection with the exercise of your Option in accordance with the withholding procedures established by the Company. Accordingly, you may not be able to exercise your Option even though the Option is vested, and the Company shall have no obligation to issue shares of Common Stock subject to your Option, unless and until such obligations are satisfied. In the event that the amount of the Company's or any Affiliate's withholding obligation in connection with your Option was greater than the amount actually withheld, you agree to indemnify and hold the Company and any applicable Affiliate harmless from any failure by the Company or applicable Affiliate to withhold the proper amount.

5. Intentionally Omitted

6. Transferability. Notwithstanding anything to the contrary in the Plan, your Option is not transferable, except to your personal representative on your death and is exercisable during your life only by you or your personal representative after your death.

7. Corporate Transaction. Your Option is subject to the terms of any agreement governing a Corporate Transaction involving the Company, including, without limitation, a provision for the appointment of a stockholder representative that is authorized to act on your behalf with respect to any escrow, indemnities and any contingent consideration.

8. No Liability for Taxes. As a condition to accepting the Option, you hereby (a) agree to not make any claim against the Company, or any of its Officers, Directors, Employees or Affiliates related to tax or social security liabilities arising from the Option or other Company compensation and (b) acknowledge that you were advised to consult with your own personal tax, financial and other legal advisors regarding the tax and social security consequences of the Option and have either done so or knowingly and voluntarily declined to do so. Additionally, if you are subject to United States taxation, you acknowledge that the Option is exempt from Section 409A only if the exercise price is at least equal to the "fair market value" of the Common Stock on the date of grant as determined by the Internal Revenue Service and there is no other impermissible deferral of compensation associated with the Option. Additionally, as a condition to accepting the Option, you agree not make any claim against the Company, or any of its Officers, Directors, Employees or Affiliates in the event that the Internal Revenue Service asserts that such exercise is less than the "fair market value" of the Common Stock on the date of grant as subsequently determined by the Internal Revenue Service.

9. Obligations; Recoupment. You hereby acknowledge that the grant of your Option is additional consideration for any obligations (whether during or after employment) that you have to the Company not to compete, not to solicit its customers, clients or employees, not to disclose or misuse confidential information or similar obligations. Accordingly, if the Company reasonably determines that you breached such obligations, in addition to any other available remedy, the Company may, to the extent permitted by Applicable Law, recoup any income realized by you with respect to the exercise of your Option within two years of such breach. In addition, to the extent permitted by Applicable Law, this right to recoupment by the Company applies in the event that your employment is terminated for Cause or if the Company reasonably determines that circumstances existed that it could have terminated your employment for Cause.

10.Severability. If any part of this Option Agreement or the Plan is declared by any court or governmental authority to be unlawful or invalid, such unlawfulness or invalidity will not invalidate any portion of this Option Agreement or the Plan not declared to be unlawful or invalid. Any Section of this Option Agreement (or part of such a Section) so declared to be unlawful or invalid will, if possible, be construed in a manner which will give effect to the terms of such Section or part of a Section to the fullest extent possible while remaining lawful and valid.

11.Indebtedness to the company. In the event that you have any loans, draws, advances or any other indebtedness owing to the Company or any Affiliate at the time of exercise of all or a portion of the Option, the Company may deduct and not deliver that number of shares of Common Stock with a Fair Market Value subject to the Option equal to such indebtedness to satisfy all or a portion of such indebtedness, to the extent permitted by law and in a manner consistent with Section 409A of the Code, if applicable.

12.Other Documents. You hereby acknowledge receipt of or the right to receive a document providing the information required by Rule 428(b)(1) promulgated under the Securities Act, which includes the Prospectus. In addition, you acknowledge receipt of the Company's Trading Policy.

13.Questions. If you have questions regarding these or any other terms and conditions applicable to your Option, including a summary of the applicable federal income tax consequences please see the Prospectus.

14.Option not a Service Contract. By accepting your Option, you acknowledge, understand and agree that:

(a) your Option is not an employment or service contract, and, if you are an Employee of the Company or an Affiliate, nothing in your Option will be deemed to create in any way whatsoever any obligation on your part to continue as an Employee of the Company or an Affiliate, or of the Company or an Affiliate to continue your employment. In addition, nothing in your Option will obligate the Company or an Affiliate, or their respective stockholders, boards of directors, officers or employees to continue any relationship that you might have as a Director or Consultant for the Company or an Affiliate;

(b) the Plan is established voluntarily by the Company, it is discretionary in nature, and may be amended, suspended or terminated by the Company at any time, to the extent permitted under the Plan;

(c) the grant of your Option is voluntary and occasional and does not create any contractual or other right to receive future grants of options (whether on the same or different terms), or benefits in lieu of options, even if options have been granted in the past;

(d) your Option and any shares of Common Stock acquired under the Plan on exercise of your Option, and the income and value of same, are not part of normal or expected compensation for any purpose, including, without limitation, calculating any severance, resignation, termination, vacation, redundancy, dismissal, end-of-service payments, bonuses, long-service awards, pension or retirement or welfare benefits or similar payments;

(e) the future value of the shares of Common Stock underlying the Option is unknown, indeterminable, and cannot be predicted with certainty;

(f) neither the Company nor any Affiliate shall be liable for any foreign exchange rate fluctuation between your local currency and the United States Dollar that may affect the value of your Option or of any amounts due to you pursuant to the exercise of your Option or the subsequent sale of any shares of Common Stock received;

(g) notwithstanding anything to the contrary in the Plan, for the purposes of the Option, your Continuous Service will be considered terminated as of the date you are no longer actively providing services to the Company or one of its Affiliates (regardless of the reason for such termination and whether or not later found to be invalid or in breach of employment laws in the jurisdiction where you are employed or are otherwise providing services, or the terms of your employment or service agreement, if any), provided that, unless otherwise expressly provided in this Option Agreement or determined by the Company, the vesting of your Option will not continue during any notice period or any period of "garden leave" or similar period mandated under employment laws in the jurisdiction where you are employed or where you are otherwise providing services, or the terms of your employment or service agreement, if any (regardless, in each case, of whether or not you are providing services to the Company or one of its Affiliates during such notice period, garden leave period, or similar period); and the Board shall have the exclusive discretion to determine when you are no longer actively providing services for purposes of the Option (including whether you may still be considered to be providing services while on a leave of absence); and

(h) no claim or entitlement to compensation or damages shall arise from forfeiture of this Option resulting from the termination of your Continuous Service (for any reason whatsoever, whether or not later found to be invalid or in breach of employment laws in the jurisdiction where you are employed or are otherwise providing services, or the terms of your employment or service agreement, if any), and in consideration of the grant of this Option to which you are otherwise not entitled, you irrevocably agree never to institute any claim against the Company or any Affiliate, waive your ability, if any, to bring any such claim, and release the Company and any Affiliate from any such claim; if, notwithstanding the

foregoing, any such claim is allowed by a court of competent jurisdiction, then, by participating in the Plan, you shall be deemed irrevocably to have agreed not to pursue such claim and agree to execute any and all documents necessary to request dismissal or withdrawal of such claim.

15.No Advice Regarding Grant. The Company is not providing any tax, legal or financial advice, nor is the Company making any recommendations regarding your participation in the Plan, or your acquisition or sale of the underlying shares of Common Stock. You should consult with your own personal tax, legal and financial advisors regarding your participation in the Plan before taking any action.

16.Data Privacy.

(a) To the extent that the processing of your personal data by the Company or its Affiliates under and/or in connection with this Option Agreement falls within the territorial scope of (i) Regulation (EU) 2016/679 of the European Parliament and of the Council of 27th April 2016 (the "***EU GDPR***"), (ii) the EU GDPR as it forms part of UK law by virtue of section 3 of the European Union (Withdrawal) Act 2018, as amended (the "***UK GDPR***"), and/or (iii) equivalent legislation and/or legislation implementing and/or supplementing the EU GDPR or UK GDPR in any member state of the European Economic Area or the UK or Switzerland, Company and/or its Affiliates will carry out such processing in accordance with their EEA/UK privacy notice from time to time in force, the latest version of which has been provided to you.

(b) Except where (a) above applies, you explicitly and unambiguously acknowledge and consent to the collection, use, transfer and other processing of your personal data as described in this paragraph (b) by the Company and its Affiliates for the purpose of implementing, administering and managing your participation in the Plan. You understand that the Company and its Affiliates hold certain personal data about you, including, but not limited to, your name, home address, telephone number, date of birth, social security number (or other identification number), salary, nationality, job title, any shares of stock or directorships held by you in the Company, details of all options or any other entitlement to shares of Common Stock awarded, cancelled, purchased, exercised, vested, unvested or outstanding in your favor for the purpose of implementing, managing and administering the Plan. You understand that this personal data may be transferred to any third parties assisting in the implementation, administration and management of the Plan.

17.Language. You acknowledge that you are sufficiently proficient in the English language, or have consulted with an advisor who is sufficiently proficient in English, so as to allow you to understand the terms and conditions of this Option Agreement. If you have received this Option Agreement, or any other document related to your Option and/or the Plan translated into a language other than English and if the meaning of the translated version is different than the English version, the English version will control.

18.Foreign Asset/Account, Exchange Control and Tax Reporting. You may be subject to foreign asset/account, exchange control and/or tax reporting requirements as a result of the acquisition, holding and/or transfer of shares of Common Stock or cash (including dividends and the proceeds arising from the sale of shares of Common Stock) derived from your participation in the Plan in, to and/or from a brokerage/bank account or legal entity located outside your country of residence. The applicable laws in your country of residence may require that you report such accounts, assets and balances therein, the value thereof and/or the transactions related thereto to the applicable authorities in such country. You may also be required to repatriate sale proceeds or other funds received as a result of your participation in the Plan to your country of residence through a designated bank or broker within a certain time after receipt. You acknowledge that it is your responsibility to be compliant with such regulations and you are encouraged to consult with your personal legal advisor for any details.

19.Applicable Law. In the event applicable laws prevent or hinder the consummation of the actions and transactions contemplated in this Option Agreement or the Plan, the Company may in its sole discretion agree to vary the terms of the Plan and/or this Option Agreement so that you receive substantially the same economic result as contemplated herein, such as through a cashless sell to cover exercise (provided that at the time of exercise the shares of Common Stock are publicly traded or otherwise liquid), a cash bonus or phantom stock.

20.Appendix. Notwithstanding any provisions in this Option Agreement, your Option shall be subject to the special terms and conditions for your country of residence and/or work set forth in the Appendix attached to this Option Agreement which, where applicable, shall prevail in the event of conflict between such terms and conditions and the terms of this Option Agreement, Grant Notice, and/or the Plan. Moreover, if you relocate to one of the countries included therein, the terms and conditions for such country will apply to you to the extent the Company determines that the application of such terms and conditions is necessary or advisable for legal or administrative reasons. The Appendix constitutes part of this Option Agreement.

21.Choice of Law. The provisions of the Plan relating to choice of law shall apply to this Option Agreement and the Option.

* * * *

APPENDIX TO OPTION AGREEMENT

This Appendix includes special terms and conditions that govern the Option granted to you under the Plan if you reside and/or work in one of the countries listed below.

The information contained herein is general in nature and may not apply to your particular situation, and you are advised to seek appropriate professional advice as to how the relevant laws in your country may apply to your situation. If you are a citizen or resident of a country other than the one in which you are currently working and/or residing, transfer employment and/or residency to another country after the Date of Grant, are a consultant, change employment status to a consultant position, or are considered a resident of another country for local law purposes, the Company shall, in its discretion, determine the extent to which the special terms and conditions contained herein shall be applicable to you. References to your employer shall include any entity that engages your services.

Switzerland

Data Privacy. The Company is part of an international group of companies. For purposes of properly administrating the Plan within the Company, it may be necessary for the Company to transmit your personal data to Affiliates of the Company or third-party service providers within or outside Switzerland. By accepting the grant of your Option and participating in the Plan you explicitly consent to the transfer of your personal data to the aforementioned countries and acknowledge and agree that there is a risk, in particular, that the rights provided for by Swiss and EU data protection laws may not or only be guaranteed to a limited extent and that foreign authorities (particularly U.S. intelligence services) may gain access to your personal data with or without your knowledge and/or any means of legal redress against such access. Such access may also result in further observations and processing of your personal data by such foreign authorities.

1.

EXHIBIT 10.27

VAXCYTE, INC.
RSU AWARD GRANT NOTICE – NON-U.S.
(2020 EQUITY INCENTIVE PLAN)

Vaxcyte, Inc. (the ***"Company"***) has awarded to you (the "***Participant***") the number of restricted stock units specified and on the terms set forth below (the ***"RSU Award"***). Your RSU Award is subject to all of the terms and conditions as set forth herein and in the Company's 2020 Equity Incentive Plan (the ***"Plan"***) and the RSU Award Agreement, including any special terms and conditions for your country of residence and/or work set forth in the appendix attached hereto (the "***Appendix***" and together, the "***Agreement***"), both of which are incorporated herein in their entirety. Capitalized terms not explicitly defined herein but defined in the Plan or the Agreement shall have the meanings set forth in the Plan or the Agreement, as applicable.

Participant: ____
Date of Grant: ____
Vesting Commencement Date: ____
Number of Restricted Stock Units: ____

Vesting Schedule: [_____]. Notwithstanding the foregoing, except as set forth below, vesting shall terminate upon the Participant's termination of Continuous Service.

Issuance Schedule: One share of Common Stock will be issued for each restricted stock unit which vests at the time set forth in Section 5 of the Agreement.

Participant Acknowledgements: By your signature below or by electronic acceptance or authentication in a form authorized by the Company, you understand and agree that:

- The RSU Award is governed by this RSU Award Grant Notice (the "***Grant Notice***"), and the provisions of the Plan and the Agreement, all of which are made a part of this document. Unless otherwise provided in the Plan, this Grant Notice and the Agreement (together, the "***RSU Award Agreement***") may not be modified, amended or revised except in a writing signed by you and a duly authorized officer of the Company.
- You have read and are familiar with the provisions of the Plan, the RSU Award Agreement and the Prospectus. In the event of any conflict between the provisions in the RSU Award Agreement, or the Prospectus and the terms of the Plan, the terms of the Plan shall control except as expressly amended or overridden in the RSU Award Agreement.
- The RSU Award Agreement sets forth the entire understanding between you and the Company regarding the acquisition of Common Stock and supersedes all prior oral and written agreements, promises and/or representations on that subject with the exception of: (i) other equity awards previously granted to you, and (ii) any written employment agreement, offer letter, severance agreement, written severance plan or policy, or other written agreement between the Company and you in each case that specifies the terms that should govern this RSU Award.

VAXCYTE, INC.
By:_____
Signature
Title:_____
Date:_____

PARTICIPANT:
_____
Signature
Date:_____

VAXCYTE, INC.
2020 EQUITY INCENTIVE PLAN

RSU AWARD AGREEMENT – NON-U.S.

As reflected by your RSU Award Grant Notice ("***Grant Notice***"), Vaxcyte, Inc. (the "***Company***") has granted you a RSU Award under its 2020 Equity Incentive Plan (the "***Plan***") for the number of restricted stock units as indicated in your Grant Notice (the "***RSU Award***"). The terms of your RSU Award as specified in this RSU Award Agreement (the definition of which shall include any special terms and conditions for your country of residence and/or work set forth in the appendix attached hereto (the "***Appendix***")) for your RSU Award (the "***Agreement***") and the Grant Notice constitute your "***RSU Award Agreement***". Defined terms not explicitly defined in this Agreement but defined in the Grant Notice or the Plan shall have the same definitions as in the Grant Notice or Plan, as applicable.

The general terms applicable to your RSU Award are as follows:

1. GOVERNING PLAN DOCUMENT. Your RSU Award is subject to all the provisions of the Plan. Your RSU Award is further subject to all interpretations, amendments, rules and regulations, which may from time to time be promulgated and adopted pursuant to the Plan. In the event of any conflict between the RSU Award Agreement and the provisions of the Plan, the provisions of the Plan shall control except as expressly amended or overridden in this Agreement.

2. GRANT OF THE RSU AWARD. This RSU Award represents your right to be issued on a future date the number of shares of the Company's Common Stock that is equal to the number of restricted stock units indicated in the Grant Notice subject to your satisfaction of the vesting conditions set forth therein (the "***Restricted Stock Units***"). Any additional Restricted Stock Units that become subject to the RSU Award pursuant to Capitalization Adjustments as set forth in the Plan and the provisions of Section 3 below, if any, shall be subject, in a manner determined by the Board, to the same forfeiture restrictions, restrictions on transferability, and time and manner of delivery as applicable to the other Restricted Stock Units covered by your RSU Award.

3. DIVIDENDS. You shall receive no benefit or adjustment to your RSU Award with respect to any cash dividend, stock dividend or other distribution that does not result from a Capitalization Adjustment as provided in the Plan; provided, however, that this sentence shall not apply with respect to any shares of Common Stock that are delivered to you in connection with your RSU Award after such shares have been delivered to you.

4. RESPONSIBILITY FOR TAXES.

(a) Regardless of any action taken by the Company or, if different, the Affiliate to which you provide Continuous Service (the "***Service Recipient***") with respect to any income tax, social insurance, payroll tax, fringe benefits tax, payment on account or other tax-related items associated with the grant or vesting of the RSU Award or sale of the underlying Common Stock or other tax-related items related to your participation in the Plan and legally applicable or deemed applicable to you (the "***Tax Liability***"), you hereby acknowledge and agree that the Tax Liability is your ultimate responsibility and may exceed the amount, if any, actually withheld by the Company or the Service Recipient. You further acknowledge that the Company and the Service Recipient (i) make no representations or undertakings regarding any Tax Liability in connection with any aspect of this RSU Award, including, but not limited to, the grant or vesting of the RSU Award, the issuance of Common Stock pursuant to such vesting, the subsequent sale of shares of Common Stock, and the payment of any dividends on the shares; and (ii) do not commit to and are under no obligation to structure the terms of the grant or any aspect of the RSU Award to reduce or eliminate your

Tax Liability or achieve a particular tax result. Further, if you are subject to Tax Liability in more than one jurisdiction, you acknowledge that the Company and/or the Service Recipient (or former service recipient, as applicable) may be required to withhold or account for Tax Liability in more than one jurisdiction.

(b) Prior to any relevant taxable or tax (or social security) withholding event, as applicable, you agree to make adequate arrangements satisfactory to the Company and/or the Service Recipient to satisfy all Tax Liability. As further provided in Section 8 of the Plan, you hereby authorize the Company and any applicable Service Recipient to satisfy any applicable withholding obligations with regard to the Tax Liability by one or a combination of the following methods: (i) causing you to pay any portion of the Tax Liability in cash or cash equivalent in a form acceptable to the Company and/or the Service Recipient; (ii) withholding from any compensation otherwise payable to you by the Company or the Service Recipient; (iii) withholding shares of Common Stock from the shares of Common Stock issued or otherwise issuable to you in connection with the Award; *provided*, however, that to the extent necessary to qualify for an exemption from application of Section 16(b) of the Exchange Act, if applicable, such share withholding procedure will be subject to the express prior approval of the Board or the Company's Compensation Committee; (iv) permitting or requiring you to enter into a "same day sale" commitment, if applicable, with a broker-dealer that is a member of the Financial Industry Regulatory Authority (a "***FINRA Dealer***"), pursuant to this authorization and without further consent, whereby you irrevocably elect to sell a portion of the shares of Common Stock to be delivered in connection with your Restricted Stock Units to satisfy the Tax Liability and whereby the FINRA Dealer irrevocably commits to forward the proceeds necessary to satisfy the Tax Liability directly to the Company or the Service Recipient; and/or (v) any other method determined by the Company to be in compliance with Applicable Law. Furthermore, you agree to pay or reimburse the Company or the Service Recipient any amount the Company or the Service Recipient may be required to withhold, collect or pay as a result of your participation in the Plan or that cannot be satisfied by the means previously described. In the event it is determined that the amount of the Tax Liability was greater than the amount withheld by the Company and/or the Service Recipient (as applicable), you agree to indemnify and hold the Company and/or the Service Recipient (as applicable) harmless from any failure by the Company or the applicable Service Recipient to withhold the proper amount.

(c) The Company and/or the Service Recipient may withhold or account for your Tax Liability by considering statutory withholding amounts or other withholding rates applicable in your jurisdiction(s), including (i) maximum applicable rates in your jurisdiction(s). In the event of over-withholding, you may receive a refund of any over-withheld amount in cash from the Company or the Service Recipient (with no entitlement to the Common Stock equivalent), or if not refunded, you may seek a refund from the local tax authorities. In the event of under-withholding, you may be required to pay any Tax Liability directly to the applicable tax authority or to the Company and/or the Service Recipient. If the Tax Liability withholding obligation is satisfied by withholding shares of Common Stock, for tax purposes, you are deemed to have been issued the full number of shares of Common Stock subject to the vested portion of the RSU Award, notwithstanding that a number of the shares of Common Stock is held back solely for the purpose of paying such Tax Liability.

(d) You acknowledge that you may not participate in the Plan and the Company shall have no obligation to issue or deliver shares of Common Stock until you have fully satisfied any applicable Tax Liability, as determined by the Company. Unless any withholding obligation for the Tax Liability is satisfied, the Company shall have no obligation to issue or deliver to you any Common Stock in respect of the RSU Award.

5. Date of Issuance.

(a) If you are subject to United States taxation, the issuance of shares in respect of the Restricted Stock Units is intended to comply with U.S. Treasury Regulations Section 1.409A-1(b)(4) and will be construed and administered in such a manner. Subject to the satisfaction of the Tax Liability withholding obligation,

if any, in the event one or more Restricted Stock Units vests, the Company shall issue to you one (1) share of Common Stock for each vested Restricted Stock Unit on the applicable vesting date. Each issuance date determined by this paragraph is referred to as an "***Original Issuance Date***."

(b) If the Original Issuance Date falls on a date that is not a business day, delivery shall instead occur on the next following business day. In addition, if:

(i) the Original Issuance Date does not occur (1) during an "open window period" applicable to you, as determined by the Company in accordance with the Company's then-effective Insider Trading Policy, or (2) on a date when you are otherwise permitted (under the Company's then-effective Insider Trading Policy, federal law, or otherwise) to (A) sell shares of Common Stock on an established stock exchange or stock market (including but not limited to under a previously established written trading plan that meets the requirements of Rule 10b5-1 under the Exchange Act and was entered into in compliance with the Company's policies (a "***10b5-1 Arrangement***) or (B) acquire shares of Common Stock), *and*

(ii) either (1) a Tax Liability withholding obligation does not apply, or (2) the Company decides, prior to the Original Issuance Date, (A) not to satisfy the Tax Liability withholding obligation by withholding shares of Common Stock from the shares otherwise due, on the Original Issuance Date, to you under this Award, and (B) not to permit you to enter into a "same day sale" commitment with a broker-dealer (including but not limited to a commitment under a 10b5-1 Arrangement) and (C) not to permit you to pay your Tax Liability in cash,

then the shares that would otherwise be issued to you on the Original Issuance Date will not be delivered on such Original Issuance Date and will instead be delivered on the first business day when you are not prohibited from selling shares of the Common Stock in the open public market or acquiring shares of Common Stock, but, if you are subject to United States taxation in no event later than December 31 of the calendar year in which the Original Issuance Date occurs (that is, the last day of your taxable year in which the Original Issuance Date occurs), or, if and only if permitted in a manner that complies with U.S. Treasury Regulations Section 1.409A-1(b)(4), no later than the date that is the 15th day of the third calendar month of the applicable year following the year in which the shares of Common Stock under this Award are no longer subject to a "substantial risk of forfeiture" within the meaning of U.S. Treasury Regulations Section 1.409A-1(d).

6. **Nature of Grant.** In accepting the RSU Award, you acknowledge, understand and agree that:

(a) the RSU Award and your participation in the Plan shall not create a right to employment or other service relationship with the Company, and the RSU Award and your participation in the Plan shall not be interpreted as forming or amending an employment or service contract with the Company or the Service Recipient, and shall not interfere with the ability of the Company or the Service Recipient, as applicable, to terminate your Continuous Service (if any);

(b) your RSU Award is not an employment or service contract, and, if you are an Employee of the Company or an Affiliate, nothing in your RSU Award will be deemed to create in any way whatsoever any obligation on your part to continue as an Employee of the Company or an Affiliate, or of the Company or an Affiliate to continue your employment. In addition, nothing in your RSU Award will obligate the Company or an Affiliate, or their respective stockholders, boards of directors, officers or employees to continue any relationship that you might have as a Director or Consultant for the Company or an Affiliate;

(c) the Plan is established voluntarily by the Company, it is discretionary in nature, and may be amended, suspended or terminated by the Company at any time, to the extent permitted under the Plan;

(d) the grant of your RSU Award is voluntary and occasional and does not create any contractual or other right to receive future grants of Awards (whether on the same or different terms), or benefits in lieu of Awards, even if Awards have been granted in the past;

(e) your RSU Award and any shares of Common Stock acquired under the Plan on settlement of your RSU Award, and the income and value of same, are not part of normal or expected compensation for any purpose, including, without limitation, calculating any severance, resignation, termination, vacation, redundancy, dismissal, end-of-service payments, bonuses, long-service awards, pension or retirement or welfare benefits or similar payments;

(f) the future value of the shares of Common Stock underlying the RSU Award is unknown, indeterminable, and cannot be predicted with certainty;

(g) neither the Company nor any Affiliate shall be liable for any foreign exchange rate fluctuation between your local currency and the United States Dollar that may affect the value of your RSU Award or of any amounts due to you pursuant to the settlement of your RSU Award or the subsequent sale of any shares of Common Stock received;

(h) notwithstanding anything to the contrary in the Plan, for the purposes of the RSU Award, your Continuous Service will be considered terminated as of the date you are no longer actively providing services to the Company or one of its Affiliates (regardless of the reason for such termination and whether or not later found to be invalid or in breach of employment laws in the jurisdiction where you are employed or are otherwise providing services, or the terms of your employment or service agreement, if any), provided that, unless otherwise expressly provided in this Agreement or determined by the Company, the vesting of your RSU Award will not continue during any notice period or any period of "garden leave" or similar period mandated under employment laws in the jurisdiction where you are employed or where you are otherwise providing services, or the terms of your employment or service agreement, if any (regardless, in each case, of whether or not you are providing services to the Company or one of its Affiliates during such notice period, garden leave period, or similar period); and the Board shall have the exclusive discretion to determine when you are no longer actively providing services for purposes of the RSU Award (including whether you may still be considered to be providing services while on a leave of absence); and

(i) no claim or entitlement to compensation or damages shall arise from forfeiture of this RSU Award resulting from the termination of your Continuous Service (for any reason whatsoever, whether or not later found to be invalid or in breach of employment laws in the jurisdiction where you are employed or are otherwise providing services, or the terms of your employment or service agreement, if any), and in consideration of the grant of this RSU Award to which you are otherwise not entitled, you irrevocably agree never to institute any claim against the Company or any Affiliate, waive your ability, if any, to bring any such claim, and release the Company and any Affiliate from any such claim; if, notwithstanding the foregoing, any such claim is allowed by a court of competent jurisdiction, then, by participating in the Plan, you shall be deemed irrevocably to have agreed not to pursue such claim and agree to execute any and all documents necessary to request dismissal or withdrawal of such claim.

7. **Transferability.** Notwithstanding anything to the contrary in the Plan, your RSU Award is not transferable, except to your personal representative on your death.

8. **Corporate Transaction.** Your RSU Award is subject to the terms of any agreement governing a Corporate Transaction involving the Company, including, without limitation, a provision for the appointment of a stockholder representative that is authorized to act on your behalf with respect to any escrow, indemnities and any contingent consideration.

9. **No Liability for Taxes**. As a condition to accepting the RSU Award, you hereby (a) agree to not make any claim against the Company, or any of its Officers, Directors, Employees or Affiliates related to any Tax Liability arising from the RSU Award and (b) acknowledge that you were advised to consult with your own personal tax, financial and other legal advisors regarding the tax consequences of the RSU Award and have either done so or knowingly and voluntarily declined to do so.

10. **No Advice Regarding Grant**. The Company is not providing any tax, legal or financial advice, nor is the Company making any recommendations regarding your participation in the Plan, or your acquisition or sale of the underlying shares of Common Stock. You should consult with your own personal tax, legal and financial advisors regarding your participation in the Plan before taking any action related to the Plan.

11. **Governing Law and Venue.** The RSU Award and the provisions of this Agreement are governed by, and construed in accordance with, the internal laws of the State of Delaware, without regard to the conflict of law principles that would result in any application of any law other than the law of the State of Delaware. For purposes of any action, lawsuit or other proceedings brought to enforce this Agreement, relating to it, or arising from it, the parties hereby submit to and consent to the sole and exclusive jurisdiction of the courts of the State of Delaware, and no other courts, where this grant is made and/or to be performed.

12. **Severability**. If any part of this Agreement or the Plan is declared by any court or governmental authority to be unlawful or invalid, such unlawfulness or invalidity will not invalidate any portion of this Agreement or the Plan not declared to be unlawful or invalid. Any Section of this Agreement (or part of such a Section) so declared to be unlawful or invalid will, if possible, be construed in a manner which will give effect to the terms of such Section or part of a Section to the fullest extent possible while remaining lawful and valid.

13. **Compliance with Law.** Notwithstanding any other provision of the Plan or this Agreement, unless there is an exemption from any registration, qualification or other legal requirement applicable to the shares of Common Stock, the Company shall not be required to deliver any shares issuable upon settlement of the Restricted Stock Units prior to the completion of any registration or qualification of the shares under any local, state, federal or foreign securities or exchange control law or under rulings or regulations of the U.S. Securities and Exchange Commission ("***SEC***") or of any other governmental regulatory body, or prior to obtaining any approval or other clearance from any local, state, federal or foreign governmental agency, which registration, qualification or approval the Company shall, in its absolute discretion, deem necessary or advisable. You understand that the Company is under no obligation to register or qualify the shares with the SEC or any state or foreign securities commission or to seek approval or clearance from any governmental authority for the issuance or sale of the shares. Further, you agree that the Company shall have unilateral authority to amend the Agreement without your consent to the extent necessary to comply with securities or other laws applicable to issuance of shares of Common Stock.

14. **Data Privacy.**

(a) To the extent that the processing of your personal data by the Company or its Affiliates under and/or in connection with this Agreement falls within the territorial scope of (i) Regulation (EU) 2016/679 of the European Parliament and of the Council of 27th April 2016 (the "***EU GDPR***"), (ii) the EU GDPR as it forms part of UK law by virtue of section 3 of the European Union (Withdrawal) Act 2018, as amended (the "***UK GDPR***"), and/or (iii) equivalent legislation and/or legislation implementing and/or supplementing the EU GDPR or UK GDPR in any member state of the European Economic Area or the UK or Switzerland, Company and/or its Affiliates will carry out such processing in accordance with their EEA/UK privacy notice from time to time in force, the latest version of which has been provided to you.

(b) Except where (a) above applies, you explicitly and unambiguously acknowledge and consent to the collection, use, transfer and other processing of your personal data as described in this paragraph (b) by the Company and its Affiliates for the purpose of implementing, administering and managing your participation in the Plan. You understand that the Company and its Affiliates hold certain personal data about you, including, but not limited to, your name, home address, telephone number, date of birth, social security number (or other identification number), salary, nationality, job title, any shares of stock or directorships held by you in the Company, details of all Awards or any other entitlement to shares of Common Stock awarded, cancelled, purchased, exercised, vested, unvested or outstanding in your favor for the purpose of implementing, managing and administering the Plan. You understand that this personal data may be transferred to any third parties assisting in the implementation, administration and management of the Plan.

15. **Language**. You acknowledge that you are sufficiently proficient in the English language, or have consulted with an advisor who is sufficiently proficient in English, so as to allow you to understand the terms and conditions of this Agreement. If you have received this Agreement, or any other document related to your RSU Award and/or the Plan translated into a language other than English and if the meaning of the translated version is different than the English version, the English version will control.

16. **Foreign Asset/Account, Exchange Control and Tax Reporting.** You may be subject to foreign asset/account, exchange control and/or tax reporting requirements as a result of the acquisition, holding and/or transfer of shares of Common Stock or cash (including dividends and the proceeds arising from the sale of shares of Common Stock) derived from your participation in the Plan in, to and/or from a brokerage/bank account or legal entity located outside your country of residence. The applicable laws in your country of residence may require that you report such accounts, assets and balances therein, the value thereof and/or the transactions related thereto to the applicable authorities in such country. You may also be required to repatriate sale proceeds or other funds received as a result of your participation in the Plan to your country of residence through a designated bank or broker within a certain time after receipt. You acknowledge that it is your responsibility to be compliant with such regulations and you are encouraged to consult with your personal legal advisor for any details.

17. **Applicable Law**. In the event applicable laws prevent or hinder the consummation of the actions and transactions contemplated in this Agreement or the Plan, the Company may in its sole discretion agree to vary the terms of the Plan and/or this Agreement so that you receive substantially the same economic result as contemplated herein, such as through a cash bonus or phantom stock.

18. **Appendix**. Notwithstanding any provisions in this Agreement, your RSU Award shall be subject to the special terms and conditions for your country of residence and/or work set forth in the Appendix attached to this Agreement which, where applicable, shall prevail in the event of conflict between such terms and conditions and the terms of this Agreement, Grant Notice, and/or the Plan. Moreover, if you relocate to one of the countries included therein, the terms and conditions for such country will apply to you to the extent the Company determines that the application of such terms and conditions is necessary or advisable for legal or administrative reasons. The Appendix constitutes part of this Agreement.

19. **Electronic Delivery and Participation.** The Company may, in its sole discretion, decide to deliver any documents related to current or future participation in the Plan by electronic means. You hereby consent to receive such documents by electronic delivery and agree to participate in the Plan through an online or electronic system established and maintained by the Company or a third party designated by the Company.

20. **Imposition of Other Requirement.** The Company reserves the right to impose other requirements on your participation in the Plan, on the RSU and on any shares of Common Stock acquired under the Plan, to the extent the Company determines it is necessary or advisable for legal or administrative

reasons, and to require you to sign any additional agreements or undertakings that may be necessary to accomplish the foregoing.

21. **Waiver.** You acknowledge that a waiver by the Company of breach of any provision of this Agreement shall not operate or be construed as a waiver of any other provision of this Agreement, or of any subsequent breach by you or any other participant.

22. **Other Documents.** You hereby acknowledge receipt of or the right to receive a document providing the information required by Rule 428(b)(1) promulgated under the Securities Act, which includes the Prospectus. In addition, you acknowledge receipt of the Company's Insider Trading Policy.

23. **Questions.** If you have questions regarding these or any other terms and conditions applicable to your RSU Award, including a summary of the applicable federal income tax consequences please see the Prospectus.

* * * *

APPENDIX TO RSU AWARD AGREEMENT

This Appendix includes special terms and conditions that govern the RSU Award granted to you under the Plan if you reside and/or work in one of the countries listed below.

The information contained herein is general in nature and may not apply to your particular situation, and you are advised to seek appropriate professional advice as to how the relevant laws in your country may apply to your situation. If you are a citizen or resident of a country other than the one in which you are currently working and/or residing, transfer employment and/or residency to another country after the Date of Grant, are a consultant, change employment status to a consultant position, or are considered a resident of another country for local law purposes, the Company shall, in its discretion, determine the extent to which the special terms and conditions contained herein shall be applicable to you. References to your employer shall include any entity that engages your services.

Switzerland

Data Privacy. The Company is part of an international group of companies. For purposes of properly administrating the Plan within the Company, it may be necessary for the Company to transmit your personal data to Affiliates of the Company or third-party service providers within or outside Switzerland. By accepting the grant of your RSU Award and participating in the Plan you explicitly consent to the transfer of your personal data to the aforementioned countries and acknowledge and agree that there is a risk, in particular, that the rights provided for by Swiss and EU data protection laws may not or only be guaranteed to a limited extent and that foreign authorities (particularly U.S. intelligence services) may gain access to your personal data with or without your knowledge and/or any means of legal redress against such access. Such access may also result in further observations and processing of your personal data by such foreign authorities

1.

Exhibit 21.1

VAXCYTE, INC.
SUBSIDIARIES OF THE REGISTRANT

Legal Entity Name	Jurisdiction of Incorporation
Vaxcyte Switzerland GmbH	Switzerland

Exhibit 23.1

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We consent to the incorporation by reference in Registration Statement Nos. 333-257622 and 333-268954 on Form S-3ASR and Nos. 333-239135, 333-254824, 333-263093 and 333-270064 on Form S-8 of our reports dated February 27, 2024, relating to the financial statements of Vaxcyte, Inc. and the effectiveness of Vaxcyte, Inc.'s internal control over financial reporting appearing in this Annual Report on Form 10-K for the year ended December 31, 2023.

/s/ Deloitte & Touche LLP
San Francisco, California
February 27, 2024

Exhibit 31.1

CERTIFICATION PURSUANT TO
RULES 13a-14(a) AND 15d-14(a) UNDER THE SECURITIES EXCHANGE ACT OF 1934,
AS ADOPTED PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Grant E. Pickering, certify that:

1. I have reviewed this Annual Report on Form 10-K of Vaxcyte, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15(d)-15(f)) for the registrant and have:

(a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

(b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

(c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

(d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

(a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

(b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: February 27, 2024

By: /s/ Grant E. Pickering

Grant E. Pickering
Chief Executive Officer

Exhibit 31.2

CERTIFICATION PURSUANT TO
RULES 13a-14(a) AND 15d-14(a) UNDER THE SECURITIES EXCHANGE ACT OF 1934,
AS ADOPTED PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Andrew Guggenhime, certify that:

1. I have reviewed this Annual Report on Form 10-K of Vaxcyte, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15(d)-15(f)) for the registrant and have:

(a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

(b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

(c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

(d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

(a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

(b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: February 27, 2024 By: /s/ Andrew Guggenhime

Andrew Guggenhime
President and Chief Financial Officer

Exhibit 32.1

CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350, AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

Pursuant to the requirement set forth in Rule 13a-14(b) of the Securities Exchange Act of 1934, as amended, (the "Exchange Act") and Section 1350 of Chapter 63 of Title 18 of the United States Code (18 U.S.C. §1350), Grant E. Pickering, Chief Executive Officer of Vaxcyte, Inc. (the "Company"), and Andrew Guggenhime, Chief Financial Officer of the Company, each hereby certifies that, to the best of his or her knowledge:

1.The Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2023, to which this Certification is attached as Exhibit 32.1 (the "Annual Report"), fully complies with the requirements of Section 13(a) or Section 15(d) of the Exchange Act; and

2.The information contained in the Annual Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Dated: February 27, 2024

/s/ Grant E. Pickering
Grant E. Pickering
Chief Executive Officer

/s/ Andrew Guggenhime
Andrew Guggenhime
President and Chief Financial Officer

"This certification accompanies the Form 10-K to which it relates, is not deemed filed with the Securities and Exchange Commission and is not to be incorporated by reference into any filing of Vaxcyte, Inc. under the Securities Act of 1933, as amended, or the Securities Exchange Act of 1934, as amended (whether made before or after the date of the Form 10-K), irrespective of any general incorporation language contained in such filing."

Exhibit 97.1

VAXCYTE, INC.

INCENTIVE COMPENSATION RECOUPMENT POLICY

Enacted October 17, 2023

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1. INTRODUCTION

The Compensation Committee (the "***Compensation Committee***") of the Board of Directors (the "***Board***") of Vaxcyte, Inc., a Delaware corporation (the "***Company***"), has determined that it is in the best interests of the Company and its stockholders to adopt this Incentive Compensation Recoupment Policy (this "***Policy***") providing for the Company's recoupment of Recoverable Incentive Compensation that is received by Covered Officers of the Company under certain circumstances. Certain capitalized terms used in this Policy have the meanings given to such terms in Section 3 below.

This Policy is designed to comply with, and shall be interpreted to be consistent with, Section 10D of the Exchange Act, Rule 10D-1 promulgated thereunder ("***Rule 10D-1***") and Nasdaq Listing Rule 5608 (the "***Listing Standards***").

2. EFFECTIVE DATE

This Policy shall apply to all Incentive Compensation that is received by a Covered Officer on or after October 2, 2023 (the "***Effective Date***"). Incentive Compensation is deemed "***received***" in the Company's fiscal period in which the Financial Reporting Measure specified in the Incentive Compensation award is attained, even if the payment or grant of such Incentive Compensation occurs after the end of that period.

3. DEFINITIONS

"***Accounting Restatement***" means an accounting restatement that the Company is required to prepare due to the material noncompliance of the Company with any financial reporting requirement under the securities laws, including any required accounting restatement to correct an error in previously issued financial statements that is material to the previously issued financial statements, or that would result in a material misstatement if the error were corrected in the current period or left uncorrected in the current period.

"***Accounting Restatement Date***" means the earlier to occur of (a) the date that the Board, a committee of the Board authorized to take such action, or the officer or officers of the Company authorized to take such action if Board action is not required, concludes, or reasonably should have concluded, that the Company is required to prepare an Accounting Restatement, or (b) the date that a court, regulator or other legally authorized body directs the Company to prepare an Accounting Restatement.

"***Administrator***" means the Compensation Committee or, in the absence of such committee, the Board.

"***Code***" means the U.S. Internal Revenue Code of 1986, as amended, and the regulations promulgated thereunder.

"***Compensation Committee***" means the Compensation Committee of the Board.

"***Covered Officer***" means each current and former Executive Officer.

"***Exchange***" means the Nasdaq Stock Market.

"***Exchange Act***" means the U.S. Securities Exchange Act of 1934, as amended.

"***Executive Officer***" means the Company's president, principal financial officer, principal accounting officer (or if there is no such accounting officer, the controller), any vice-president of the Company in charge of a principal business unit, division, or function (such as sales, administration, or finance), any other officer who performs a policy-making function, or any other person who performs similar policy-making functions for the Company. Executive officers of the Company's parent(s) or subsidiaries are deemed executive officers of the Company if they perform such policy-making functions for the Company. Policy-making function is not intended to include policy-making functions that are not significant. Identification of an executive officer for purposes of this Policy would include at a minimum executive officers identified pursuant to Item 401(b) of Regulation S-K promulgated under the Exchange Act.

"***Financial Reporting Measures***" means measures that are determined and presented in accordance with the accounting principles used in preparing the Company's financial statements, and any measures derived wholly or in part from such measures, including Company stock price and total stockholder return ("***TSR***"). A measure need not be presented in the Company's financial statements or included in a filing with the SEC in order to be a Financial Reporting Measure.

"***Incentive Compensation***" means any compensation that is granted, earned or vested based wholly or in part upon the attainment of a Financial Reporting Measure.

"***Lookback Period***" means the three completed fiscal years immediately preceding the Accounting Restatement Date, as well as any transition period (resulting from a change in the Company's fiscal year) within or immediately following those three completed fiscal years (except that a transition period of at least nine months shall count as a completed fiscal year). Notwithstanding the foregoing, the Lookback Period shall not include fiscal years completed prior to the Effective Date.

"***Recoverable Incentive Compensation***" means Incentive Compensation received by a Covered Officer during the Lookback Period that exceeds the amount of Incentive Compensation that would have been received had such amount been determined based on the Accounting Restatement, computed without regard to any taxes paid (*i.e.*, on a gross basis without regard to tax withholdings and other deductions). For any compensation plans or programs that take into account Incentive Compensation, the amount of Recoverable Incentive Compensation for purposes of this Policy shall include, without limitation, the amount contributed to any notional account based on Recoverable Incentive Compensation and any earnings to date on that notional amount. For any Incentive Compensation that is based on stock price or TSR, where the Recoverable Incentive Compensation is not subject to mathematical recalculation directly from the information in an Accounting Restatement, the Administrator will determine the amount of Recoverable Incentive Compensation based on a reasonable estimate of the effect of the Accounting Restatement on the stock price or TSR upon which the Incentive Compensation was received. The Company shall maintain documentation of the determination of that reasonable estimate and provide such documentation to the Exchange in accordance with the Listing Standards.

"***SEC***" means the U.S. Securities and Exchange Commission.

4. RECOUPMENT

(a) Applicability of Policy. This Policy applies to Incentive Compensation received by a Covered Officer (i) after beginning services as an Executive Officer, (ii) who served as an Executive Officer at any time during the performance period for such Incentive Compensation, (iii) while the Company had a class of securities listed on a national securities exchange or a national securities association, and (iv) during the Lookback Period.

(b) Recoupment Generally. Pursuant to the provisions of this Policy, if there is an Accounting Restatement, the Company must reasonably promptly recoup the full amount of the Recoverable Incentive Compensation, unless the conditions of one or more subsections of Section 4(c) of this Policy are met and the Compensation Committee, or, if such committee does not consist solely of independent directors, a majority of the independent directors serving on the Board, has made a determination that recoupment would be impracticable. Recoupment is required regardless of whether the Covered Officer engaged in any misconduct and regardless of fault, and the Company's obligation to recoup Recoverable Incentive Compensation is not dependent on whether or when any restated financial statements are filed.

(c) Impracticability of Recovery. Recoupment may be determined to be impracticable if, and only if:

(i) the direct expense paid to a third party to assist in enforcing this Policy would exceed the amount of the applicable Recoverable Incentive Compensation; provided that, before concluding that it would be impracticable to recover any amount of Recoverable Incentive Compensation based on expense of enforcement, the Company shall make a reasonable attempt to recover such Recoverable Incentive Compensation, document such reasonable attempt(s) to recover, and provide that documentation to the Exchange in accordance with the Listing Standards; or

(ii) recoupment of the applicable Recoverable Incentive Compensation would likely cause an otherwise tax-qualified retirement plan, under which benefits are broadly available to employees of the Company, to fail to meet the requirements of Code Section 401(a)(13) or Code Section 411(a) and regulations thereunder.

(d) Sources of Recoupment. To the extent permitted by applicable law, the Administrator shall, in its sole discretion, determine the timing and method for recouping Recoverable Incentive Compensation hereunder, provided that such recoupment is undertaken reasonably promptly. The Administrator may, in its discretion, seek recoupment from a Covered Officer from any of the following sources or a combination thereof, whether the applicable compensation was approved, awarded, granted, payable or paid to the Covered Officer prior to, on or after the Effective Date: (i) direct repayment of Recoverable Incentive Compensation previously paid to the Covered Officer; (ii) cancelling prior cash or equity-based awards (whether vested or unvested and whether paid or unpaid); (iii) cancelling or offsetting against any planned future cash or equity-based awards; (iv) forfeiture of deferred compensation, subject to compliance with Code Section 409A; and (v) any other method authorized by applicable law or contract. Subject to compliance with any applicable law, the Administrator may effectuate recoupment under this Policy from any amount otherwise payable to the Covered Officer, including amounts payable to such individual under any otherwise applicable Company plan or program, *e.g.*, base salary, bonuses or commissions and compensation previously deferred by the Covered Officer. The Administrator need not utilize the same method of recovery for all Covered Officers or with respect to all types of Recoverable Incentive Compensation.

(e) No Indemnification of Covered Officers. Notwithstanding any indemnification

agreement, applicable insurance policy or any other agreement or provision of the Company's certificate of incorporation or bylaws to the contrary, no Covered Officer shall be entitled to indemnification or advancement of expenses in connection with any enforcement of this Policy by the Company, including paying or reimbursing such Covered Officer for insurance premiums to cover potential obligations to the Company under this Policy.

(f) Indemnification of Administrator. Any members of the Administrator, and any other members of the Board who assist in the administration of this Policy, shall not be personally liable for any action, determination or interpretation made with respect to this Policy and shall be indemnified by the Company to the fullest extent under applicable law and Company policy with respect to any such action, determination or interpretation. The foregoing sentence shall not limit any other rights to indemnification of the members of the Board under applicable law or Company policy.

(g) No "Good Reason" for Covered Officers. Any action by the Company to recoup or any recoupment of Recoverable Incentive Compensation under this Policy from a Covered Officer shall not be deemed (i) "good reason" for resignation or to serve as a basis for a claim of constructive termination under any benefits or compensation arrangement applicable to such Covered Officer, or (ii) to constitute a breach of a contract or other arrangement to which such Covered Officer is party.

5. Administration

Except as specifically set forth herein, this Policy shall be administered by the Administrator. The Administrator shall have full and final authority to make any and all determinations required under this Policy. Any determination by the Administrator with respect to this Policy shall be final, conclusive and binding on all interested parties and need not be uniform with respect to each individual covered by this Policy. In carrying out the administration of this Policy, the Administrator is authorized and directed to consult with the full Board or such other committees of the Board as may be necessary or appropriate as to matters within the scope of such other committee's responsibility and authority. Subject to applicable law, the Administrator may authorize and empower any officer or employee of the Company to take any and all actions that the Administrator, in its sole discretion, deems necessary or appropriate to carry out the purpose and intent of this Policy (other than with respect to any recovery under this Policy involving such officer or employee).

6. Severability

If any provision of this Policy or the application of any such provision to a Covered Officer shall be adjudicated to be invalid, illegal or unenforceable in any respect, such invalidity, illegality or unenforceability shall not affect any other provisions of this Policy, and the invalid, illegal or unenforceable provisions shall be deemed amended to the minimum extent necessary to render any such provision or application enforceable.

7. No Impairment of Other Remedies

Nothing contained in this Policy, and no recoupment or recovery as contemplated herein, shall limit any claims, damages or other legal remedies the Company or any of its affiliates may have against a Covered Officer arising out of or resulting from any actions or omissions by the Covered Officer. This Policy does not preclude the Company from taking any other action to enforce a Covered Officer's obligations to the Company, including, without limitation, termination of employment and/or institution of civil proceedings. This Policy is in addition to the requirements of Section 304 of the Sarbanes-Oxley Act of 2002 ("***SOX 304***") that are applicable to the Company's Chief Executive Officer and Chief Financial

Officer and to any other compensation recoupment policy and/or similar provisions in any employment, equity plan, equity award, or other individual agreement, to which the Company is a party or which the Company has adopted or may adopt and maintain from time to time; provided, however, that compensation recouped pursuant to this Policy shall not be duplicative of compensation recouped pursuant to SOX 304 or any such compensation recoupment policy and/or similar provisions in any such employment, equity plan, equity award, or other individual agreement except as may be required by law.

8. Amendment; Termination

The Administrator may amend, terminate or replace this Policy or any portion of this Policy at any time and from time to time in its sole discretion. The Administrator shall amend this Policy as it deems necessary to comply with applicable law or any Listing Standard.

9. Successors

This Policy shall be binding and enforceable against all Covered Officers and, to the extent required by Rule 10D-1 and/or the applicable Listing Standards, their beneficiaries, heirs, executors, administrators or other legal representatives.

10. Required Filings

The Company shall make any disclosures and filings with respect to this Policy that are required by law, including as required by the SEC.

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