UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

FORM 10-Q

(Mark One)

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

For the quarterly period ended September 30, 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

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 is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes ☐ No ☒

As of November 2, 2023, the registrant had 95,153,909 shares of common stock, $0.001 par value per share, outstanding.

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Unless the context otherwise requires, all references in this Quarterly Report on Form 10-Q 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 Quarterly Report on Form 10-Q 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 Quarterly Report on Form 10-Q, 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 Quarterly Report on Form 10-Q 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 and the ability of our third-party contract manufacturers to operate and continue operations;
- 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 Quarterly Report on Form 10-Q 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 Quarterly Report on Form 10-Q. 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 Quarterly Report on Form 10-Q. 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 Quarterly Report on Form 10-Q. 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 Quarterly Report on Form 10-Q 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 Quarterly Report on Form 10-Q to reflect events or circumstances after the date of this Quarterly Report on Form 10-Q 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 Quarterly Report on Form 10-Q. These risks include, but are not limited to, the following:

- We are in the clinical or preclinical phase 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, or FDA, 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 pneumococcal conjugate vaccine candidates – VAX-24, which is in clinical development, and VAX-31, which is in preclinical 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 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 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—FINANCIAL INFORMATION

Item 1. Financial Statements

VAXCYTE, INC.
Condensed Balance Sheets
(in thousands, except share and per share data)
(unaudited)

	September 30, 2023	December 31, 2022
Assets		
Current assets:		
Cash and cash equivalents	$ 545,134	$ 834,657
Short-term investments	720,550	96,719
Prepaid expenses and other current assets	29,750	11,179
Total current assets	1,295,434	942,555
Property and equipment, net	11,431	10,360
Operating lease right-of-use assets	16,333	21,288
Long-term investments	168,564	26,549
Restricted cash	1,103	871
Other assets	3,192	4,555
Total noncurrent assets	200,623	63,623
Total assets	$ 1,496,057	$ 1,006,178
Liabilities and Stockholders' Equity		
Current liabilities:		
Accounts payable	$ 15,704	$ 9,795
Accrued compensation	6,925	1,180
Accrued manufacturing expenses	41,880	8,265
Accrued expenses	15,021	15,375
Operating lease liabilities — current	6,028	5,910
Total current liabilities	85,558	40,525
Operating lease liabilities — long-term	7,781	12,031
Other liabilities	2	9
Total liabilities	93,341	52,565
Commitments and contingencies (Note 6)		
Stockholders' Equity		
Preferred stock, $0.001 par value — 10,000,000 shares authorized at September 30, 2023 and December 31, 2022; no shares issued and outstanding at September 30, 2023 and December 31, 2022	—	—
Common stock, $0.001 par value — 500,000,000 shares authorized at September 30, 2023 and December 31, 2022; 95,099,101 and 79,470,670 shares issued and outstanding at September 30, 2023 and December 31, 2022, respectively	98	82
Additional paid-in capital	2,148,499	1,476,018
Accumulated other comprehensive loss	(2,290)	(361)
Accumulated deficit	(743,591)	(522,126)
Total stockholders' equity	1,402,716	953,613
Total liabilities and stockholders' equity	$ 1,496,057	$ 1,006,178

The accompanying notes are an integral part of these unaudited condensed financial statements.

VAXCYTE, INC.
Condensed Statements of Operations
(in thousands, except share and per share data)
(unaudited)

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2023	2022	2023	2022
Operating expenses:				
Research and development	$ 97,421	$ 47,679	$ 228,191	$ 117,825
General and administrative	15,605	10,898	43,174	27,858
Total operating expenses	113,026	58,577	271,365	145,683
Loss from operations	(113,026)	(58,577)	(271,365)	(145,683)
Other income (expense), net:				
Interest expense	—	—	—	(2)
Interest income	18,495	1,190	45,339	1,723
Grant income	1,640	157	4,759	1,006
Foreign currency transaction gains (losses)	227	(687)	(198)	(2,479)
Total other income, net	20,362	660	49,900	248
Net loss	$ (92,664)	$ (57,917)	$ (221,465)	$ (145,435)
Net loss per share, basic and diluted	$ (0.91)	$ (0.93)	$ (2.32)	$ (2.42)
Weighted-average shares outstanding, basic and diluted	101,668,655	61,989,347	95,367,751	60,166,583

The accompanying notes are an integral part of these unaudited condensed financial statements.

VAXCYTE, INC.
Condensed Statements of Comprehensive Loss
(in thousands)
(unaudited)

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2023	2022	2023	2022
Net Loss	$ (92,664)	$ (57,917)	$ (221,465)	$ (145,435)
Other comprehensive loss:				
Unrealized gains (losses) on investments	231	247	(1,929)	(416)
Comprehensive loss	$ (92,433)	$ (57,670)	$ (223,394)	$ (145,851)

The accompanying notes are an integral part of these unaudited condensed financial statements.

VAXCYTE, INC.
Condensed Statements of Stockholders' Equity
(in thousands, except share data)
(unaudited)

	Common Stock		Additional Paid-in Capital	Accumulated Deficit	Accumulated Other Comprehensive Gain (Loss)	Total Stockholders' Equity
	Shares	Amount				
Balance — December 31, 2022	79,470,670	$ 82	$ 1,476,018	$ (522,126)	$ (361)	$ 953,613
Exercise of stock options	100,964	1	501	—	—	502
Issuance of common stock in connection with at-the-market offering, net of commissions and offering expenses of $1,237	1,041,536	1	41,786	—	—	41,787
Release of restricted stock units	27,681		(727)	—	—	(727)
Vesting of early exercised stock options	—	—	2	—	—	2
Stock-based compensation expense	—	—	9,648	—	—	9,648
Unrealized gains on investments	—	—	—	—	408	408
Net loss	—	—	—	(60,462)	—	(60,462)
Balance — March 31, 2023	80,640,851	$ 84	$ 1,527,228	$ (582,588)	$ 47	$ 944,771
Exercise of stock options	69,951	—	884	—	—	884
Issuance of common stock and pre-funded warrants in connection with follow-on public offering, net of issuance costs of $29,952	13,030,000	13	545,266	—	—	545,279
Issuance of common stock under Employee Stock Purchase Plan	43,060	—	1,017	—	—	1,017
Release of restricted stock units	28,671	—	(214)	—	—	(214)
Vesting of early exercised stock options	—	—	2	—	—	2
Stock-based compensation expense	—	—	12,544	—	—	12,544
Unrealized losses on investments	—	—	—	—	(2,568)	(2,568)
Net loss	—	—	—	(68,339)	—	(68,339)
Balance — June 30, 2023	93,812,533	$ 97	$ 2,086,727	$ (650,927)	$ (2,521)	$ 1,433,376
Exercise of stock options	144,818	—	2,156	—	—	2,156
Issuance of common stock in connection with at-the-market offering, net of commissions and offering expenses of $1,000	1,054,407	1	48,999	—	—	49,000
Release of restricted stock units	87,343	—	(2,605)	—	—	(2,605)
Vesting of early exercised stock options	—	—	2	—	—	2
Stock-based compensation expense	—	—	13,220	—	—	13,220
Unrealized gains on investments	—	—	—	—	231	231
Net loss	—	—	—	(92,664)	—	(92,664)
Balance — September 30, 2023	95,099,101	$ 98	$ 2,148,499	$ (743,591)	$ (2,290)	$ 1,402,716

The accompanying notes are an integral part of these unaudited condensed financial statements.

VAXCYTE, INC.
Condensed Statements of Stockholders' Equity
(in thousands, except share data)
(unaudited)

	Common Stock		Additional Paid-in Capital	Accumulated Deficit	Accumulated Other Comprehensive Loss	Total Stockholders' Equity
	Shares	Amount				
Balance — December 31, 2021	53,031,978	$ 56	$ 582,844	$ (298,641)	$ (241)	$ 284,018
Exercise of stock options	91,044	—	282	—	—	282
Vesting of early exercised stock options	—	—	2	—	—	2
Issuance of common stock and pre-funded warrants in connection with follow-on public offering, net of issuance costs of $7,376	3,250,000	3	107,619	—	—	107,622
Issuance of common stock in connection with at-the-market offering, net of commissions and offering expenses of $114	126,522	—	3,098	—	—	3,098
Stock-based compensation expense	—	—	4,099	—	—	4,099
Unrealized losses on investments	—	—	—	—	(592)	(592)
Net loss	—	—	—	(38,986)	—	(38,986)
Balance — March 31, 2022	56,499,544	$ 59	$ 697,944	$ (337,627)	$ (833)	$ 359,543
Exercise of stock options	77,065	1	323	—	—	324
Vesting of early exercised stock options	—	—	2	—	—	2
Issuance of common stock in connection with at-the-market offering, net of commissions and offering expenses of $1,509	2,010,806	2	48,786	—	—	48,788
Issuance of common stock under Employee Stock Purchase Plan	36,879	—	550	—	—	550
Issuance costs for public follow-on offering	—	—	2	—	—	2
Stock-based compensation expense	—	—	5,894	—	—	5,894
Unrealized losses on investments	—	—	—	—	(71)	(71)
Net loss	—	—	—	(48,532)	—	(48,532)
Balance — June 30, 2022	58,624,294	$ 62	$ 753,501	$ (386,159)	$ (904)	$ 366,500
Exercise of stock options	222,358	—	1,757	—	—	1,757
Vesting of early exercised stock options	—	—	2	—	—	2
Issuance of common stock in connection with at-the-market offering, net of commissions and offering expenses of $1,261	1,679,437	2	42,933	—	—	42,935
Release of restricted stock units	46,603	—	(861)	—	—	(861)
Stock-based compensation expense	—	—	6,648	—	—	6,648
Unrealized gains on investments	—	—	—	—	247	247
Net loss	—	—	—	(57,917)	—	(57,917)
Balance — September 30, 2022	60,572,692	$ 64	$ 803,980	$ (444,076)	$ (657)	$ 359,311

The accompanying notes are an integral part of these unaudited condensed financial statements.

VAXCYTE, INC.
Condensed Statements of Cash Flows
(in thousands)
(unaudited)

	Nine Months Ended September 30,	
	2023	**2022**
Cash flows from operating activities:		
Net loss	$ (221,465)	$ (145,435)
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation and amortization	2,268	1,875
Stock-based compensation expense	35,412	16,641
Amortization of operating lease right-of-use assets	4,955	5,021
Net amortization (accretion) of premiums (discounts) on investments	(32,406)	228
Loss on disposal of fixed assets	—	44
Asset impairment charges	—	213
Changes in operating assets and liabilities:		
Prepaid expenses and other current assets	2,431	2,852
Other assets	1,363	(534)
Operating lease liabilities	(4,132)	2,991
Accounts payable	4,746	(575)
Accrued compensation	5,745	(4)
Accrued manufacturing expenses	33,614	5,830
Accrued expenses	(511)	5,477
Net cash used in operating activities	(167,980)	(105,376)
Cash flows from investing activities:		
Purchases of property and equipment	(10,808)	(4,701)
Purchases of investments	(1,126,286)	(31,460)
Maturities of investments	368,919	136,191
Sale of investments	8,790	10,500
Proceeds from sale of property and equipment	—	7
Net cash (used in) provided by investing activities	(759,385)	110,537
Cash flows from financing activities:		
Proceeds from exercise of common stock options	3,541	2,363
Proceeds from issuance of common stock related to at-the-market offering, net of issuance costs	90,787	95,238
Proceeds from issuance of common stock from follow-on offering, net of issuance costs	545,279	107,624
Release of restricted stock units	(3,546)	(861)
Proceeds from issuance of common stock under Employee Stock Purchase Plan	1,017	550
Net cash provided by financing activities	637,078	204,914
Effect of exchange rate changes on cash and cash equivalents	996	(659)
Net (decrease) increase in cash, cash equivalents and restricted cash	(289,291)	209,416
Cash, cash equivalents and restricted cash, beginning of period	835,528	69,856
Cash, cash equivalents and restricted cash, end of period	$ 546,237	$ 279,272
Supplemental disclosure of cash flow information:		
Cash paid for interest	$ —	$ 2
Supplemental disclosure of non-cash investing activities:		
Purchases of property and equipment recorded in accounts payable and accrued expenses	$ 433	$ 141

The accompanying notes are an integral part of these unaudited condensed financial statements.

1. Company Organization and Nature of Business

Vaxcyte, Inc. ("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. 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

These condensed 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 ("SEC") regarding interim financial reporting. Certain information and footnote disclosures normally included in the financial statements prepared in accordance with U.S. GAAP have been condensed or omitted in accordance with such rules and regulations.

Unaudited Interim Condensed Financial Statements

The condensed balance sheet as of September 30, 2023, the condensed statements of operations, comprehensive loss and stockholders' equity for the three and nine months ended September 30, 2023 and 2022 and the condensed statements of cash flows for the nine months ended September 30, 2023 and 2022 are unaudited. The unaudited interim condensed financial statements have been prepared on the same basis as the audited annual financial statements and reflect, in the opinion of management, all adjustments of a normal and recurring nature that are necessary for the fair statement of our financial information. The financial data disclosed in the footnotes to the condensed financial statements related to the three and nine months ended September 30, 2023 and 2022 are also unaudited. The results of operations for the three and nine months ended September 30, 2023 are not necessarily indicative of the results to be expected for the year ending December 31, 2023 or for any other future annual or interim period. These interim condensed financial statements should be read in conjunction with our audited financial statements and related notes thereto for the year ended December 31, 2022 included in our Annual Report on Form 10-K filed with the SEC on February 27, 2023.

Use of Estimates

The preparation of 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 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 valuation of deferred tax assets and income taxes. We base our estimates on historical experience and various other assumptions that we believe 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.

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 standby letters of credit, which were issued to serve as collateral for the lease agreements related to our current corporate headquarters. Cash, cash equivalents and restricted cash as reported within the condensed balance sheets that total to the same amounts shown in the condensed statements of cash flows are as follows:

	September 30, 2023	December 31, 2022
	(in thousands)	
Cash and cash equivalents	$ 545,134	$ 834,657
Restricted cash	1,103	871
Cash, cash equivalents and restricted cash	$ 546,237	$ 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 condensed 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 condensed 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 condensed statements of operations only if we sell or intend to sell the security before recovery of its cost basis.

Net Loss Per Share

Basic net loss per share is calculated by dividing the net loss by the weighted average of shares of common stock outstanding, including pre-funded warrants issued, during the period, without consideration for common stock equivalents. 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. Diluted net loss per share is the same as basic net loss per share since the effects of potentially dilutive securities are anti-dilutive given the net loss for each period presented.

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 September 30, 2023, our lease population consisted of office operating leases. As of September 30, 2023, we did not have 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 condensed balance sheet. 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 condensed balance sheets.

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 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 have not experienced any significant losses on our deposits of cash, cash equivalents or investments.

We are subject to supplier concentration risk from our suppliers. 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; 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 Quarterly Report on Form 10-Q.

3. Fair Value Measurements and Fair Value of Financial Instruments

Assets and liabilities recorded at fair value on a recurring basis in the condensed 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 based on our own data or other assumptions 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 as of September 30, 2023 or December 31, 2022.

There were no transfers within the hierarchies during the three and nine months ended September 30, 2023 or the year ended December 31, 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 September 30, 2023 and December 31, 2022:

	Fair Value Hierarchy Level	September 30, 2023 Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value
Assets			(in thousands)		
Cash and cash equivalents:					
Cash	Level 1	$ 58,838	$ —	$ —	$ 58,838
Money market funds	Level 1	49,321	—	—	49,321
Commercial paper	Level 2	437,133	—	(158)	436,975
Total cash and cash equivalents		545,292	—	(158)	545,134
Investments:					
U.S. Treasury securities	Level 1	498,495	—	(1,012)	497,483
Commercial paper	Level 2	137,780	—	(12)	137,768
Corporate debt	Level 2	126,820	—	(342)	126,478
Asset-backed securities	Level 2	24,655	—	(53)	24,602
U.S. government agency securities	Level 2	103,496	1	(714)	102,783
Total investments		891,246	1	(2,133)	889,114
Total assets measured at fair value		$ 1,436,538	$ 1	$ (2,291)	$ 1,434,248

	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 September 30, 2023 (in thousands):

	September 30, 2023 Fair Value
Due in less than one year	$ 720,550
Due in one to five years	168,564
Total	$ 889,114

4. Balance Sheet Details

Prepaid Expenses and Other Current Assets

Prepaid expenses and other current assets as of September 30, 2023 and December 31, 2022 consisted of the following:

	September 30, 2023	December 31, 2022
	(in thousands)	
Prepaid expenses	$ 15,335	$ 5,312
Purchased equipment deposits	7,792	—
Interest receivable	3,438	2,848
Grant receivable	1,886	1,029
Other current assets	1,299	1,990
Total	$ 29,750	$ 11,179

Property and Equipment, Net

Property and equipment, net as of September 30, 2023 and December 31, 2022 consisted of the following:

	September 30, 2023	December 31, 2022
	(in thousands)	
Furniture and equipment	$ 1,608	$ 1,608
Computers and computer software	416	416
Lab equipment	16,438	13,100
Leasehold improvements	1,353	1,353
Total property and equipment	19,815	16,477
Less: accumulated depreciation and amortization	(8,384)	(6,117)
Property and equipment, net	$ 11,431	$ 10,360

Depreciation and amortization expense was $0.8 million and $0.7 million for the three months ended September 30, 2023 and 2022, respectively, and $2.3 million and $1.9 million for the nine months ended September 30, 2023 and 2022, respectively.

Accrued Expenses

Accrued expenses as of September 30, 2023 and December 31, 2022 consisted of the following:

	September 30, 2023	December 31, 2022
	(in thousands)	
Clinical studies	$ 476	$ 1,518
Other research and development	12,052	12,446
Other accrued expenses	2,493	1,411
Total	$ 15,021	$ 15,375

5. Leases

Operating Lease Obligations

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 as a result of growth in personnel and lab space requirements. 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 both 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 lease is as follows (dollar amounts in thousands):

	Three Months Ended		Nine Months Ended	
	September 30, 2023	September 30, 2022	September 30, 2023	September 30, 2022
Cash paid for operating lease liabilities	$ 1,671	$ 1,631	$ 5,013	$ 3,743
Weighted-average remaining lease term (in years)			2.04	3.04
Weighted-average discount rate			7.6%	7.6%

Maturities of lease liabilities as of September 30, 2023 were as follows:

Years ending December 31,	(in thousands)
Remainder of 2023	$ 1,114
2024	6,850
2025	7,022
Total future undiscounted lease payments	14,986
Less: Imputed interest	(1,177)
Total lease liabilities	$ 13,809

Rent expense recognized under the leases was $1.9 million and $1.9 million for the three months ended September 30, 2023 and 2022, respectively, and $5.8 million and $6.0 million for the nine months ended September 30, 2023 and 2022, respectively.

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 headquarters (the “Assumed Lease Premises”). The assumed lease has an original contractual term of 10.0 years, expiring on November 30, 2031, unless earlier terminated. Pursuant to the Assignment Agreement, the base rent is 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. For accounting purposes, as of September 30, 2023, this new lease had not yet commenced and, as such, no lease liability or ROU asset were recorded on the condensed balance sheet and no operating lease expense had been recorded on the condensed statements of operations and comprehensive loss for the three and nine months ended September 30, 2023. See Note 14, “Subsequent Events.”

6. 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 September 30, 2023, 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 director and officer 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

In October 2016, we entered into a non-exclusive development and manufacturing services agreement, as amended, with Lonza (the "2016 Lonza DMSA") pursuant to which Lonza was obligated to perform manufacturing process development and the manufacture of components for VAX-24, including the polysaccharide antigens, our proprietary eCRM protein carrier and conjugated drug substances. Subject to the terms and conditions set forth in the 2016 Lonza DMSA, Lonza 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 manufactured under the 2016 Lonza DMSA (each term as defined in the 2016 Lonza DMSA). The term of the 2016 Lonza DMSA expired on March 31, 2023. In September 2017, we and Lonza agreed to defer the completion payments for any stage that commenced after December 31, 2019 or had not been completed by December 31, 2019 until the earlier of the completion of all Investigational New Drug ("IND")-enabling activities or December 31, 2020. In March 2020, Lonza agreed to defer the completion payments until the earlier of the completion of all IND-enabling activities or April 30, 2021. In April 2021, Lonza further agreed to defer 50% of the completion payments until the earlier of the completion of all IND-enabling activities or December 31, 2021. Pursuant to this agreement, all deferred completion payments were paid in December 2021.

In June 2018, we entered into a letter agreement with Lonza (the "Lonza Letter Agreement") pursuant to which we agreed to certain terms for potential future payments in shares of our common stock as partial satisfaction of future obligations to Lonza. The Lonza Letter Agreement stated that the initial pre-IND cash payments under the 2016 Lonza DMSA were subject to a specified dollar cap (the "Initial Cash Cap"). After the Initial Cash Cap was reached, we had the option to make any further pre-IND payments owed to Lonza in cash, in shares of our common stock at then market prevailing prices, or a combination of both, at our election. In April 2021, we reached the Initial Cash Cap and notified Lonza that we would be exercising our option to issue approximately $10.0 million in shares of our common stock as payment for a portion of pre-IND payments due April 30, 2021. In June 2021, we issued 399,680 shares of our common stock to Lonza at a price of $25.02 per share to pay for $10.0 million of the pre-IND payments due April 30, 2021.

In October 2018, we entered into a second non-exclusive development and manufacturing services agreement with Lonza (the "2018 Lonza DMSA"), pursuant to which Lonza is obligated to perform services including manufacturing process development and the manufacture and supply of VAX-24 finished drug product. Subject to the terms and conditions set forth in the 2018 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 (each term as defined in the 2018 Lonza DMSA). Unless earlier terminated, the 2018 Lonza DMSA will remain in place for a period of five years. Either party has the right to terminate the 2018 Lonza DMSA upon a six-month notice period, provided that Lonza may not exercise such right until a specified future date. Either party has the right to terminate the 2018 Lonza

DMSA if the other party commits a material breach under the applicable agreement and does not cure such breach within a given time period, for specified bankruptcy events or if a party receives a notice from the other party or otherwise becomes aware that a debarment, suspension, exclusion, sanction or declaration of ineligibility action has been brought against the other party, and we may terminate the 2018 Lonza DMSA for an extended force majeure event.

In April 2022, we entered into a third non-exclusive development and manufacturing services agreement, as amended, with Lonza (the "2022 Lonza DMSA") effective as of March 22, 2022. Pursuant to the 2022 Lonza DMSA, Lonza is obligated to perform services including manufacturing process development and clinical manufacture and supply of our proprietary pneumococcal conjugate vaccine ("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 a fourth non-exclusive development and manufacturing services agreement with Lonza (the "2023 Lonza DMSA") effective as of March 1, 2023. 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 2016 Lonza DMSA, 2018 Lonza DMSA, 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 right, 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).

See Note 14, "Subsequent Events" for details of the Commercial Manufacturing and Supply Agreement entered into with Lonza in the fourth quarter of 2023.

Sutro Option Agreement

In December 2022, we entered into an Option Agreement with Sutro Biopharma (the "Option Agreement"), pursuant to which 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 are necessary to give effect to each of the terms and

conditions set forth in the Term Sheet (the "Form Definitive Agreement"). The Option period is 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 agreed to pay 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 elect to exercise the Option, we would 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 the event that we undergo a change of control, certain rights and payments may be accelerated.

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. As of September 30, 2023 and December 31, 2022, the $5.0 million accrued commitment remains outstanding and is included in accounts payable and accrued expenses in the accompanying condensed balance sheets, respectively. 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.

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 September 30, 2023, we had the following amounts due 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)**
Remainder of 2023	$ 46,324
2024	77,450
2025	1,856
2026	1,061
Total non-cancelable purchase commitments due to our key manufacturing partners	$ 126,691

7. 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 95,099,101 and 79,470,670 shares were issued and outstanding as of September 30, 2023 and December 31, 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 of Directors (our "Board"). As of September 30, 2023 and December 31, 2022, no dividends had 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 aggregated 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 aggregated 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 September 30, 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 issuance 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:

	September 30, 2023	December 31, 2022
Options issued and outstanding	9,257,155	7,715,494
Restricted stock units outstanding	700,418	456,766
Shares available for future stock option grants	6,408,390	4,679,598
Total	16,365,963	12,851,858

8. 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 September 30, 2023, no shares underlying the pre-funded warrants had been exercised.

9. 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 will be automatically increased on the first day of each

calendar year during the ten-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. Effective January 1, 2023, the number of shares of common stock available under the 2020 Plan increased by 3,973,533 shares pursuant to the evergreen provision. As of September 30, 2023, an aggregate of 6,408,390 shares of common stock were available for issuance under 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. As of September 30, 2023, 7,577,134 shares and 2,380,439 shares of common stock were subject to outstanding options and RSUs under the 2020 Plan and 2014 Plan, respectively.

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 condensed balance sheet and is reclassified to common stock and additional paid-in capital as such shares vest.

At September 30, 2023 and December 31, 2022, 927 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 September 30, 2023 and December 31, 2022 were both less than $0.1 million and were recorded in other liabilities.

Stock Options and Restricted Stock Units Activity

Stock options and RSUs 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 Options and Restricted Stock Units Activity	Options and Restricted Stock Units Available for Grant	Number of Options	Weighted-Average Exercise Price Per Share	Weighted-Average Remaining Contractual Term (Years)	Aggregate Intrinsic Value
Balances — December 31, 2022	4,679,598	7,715,494			
Additional shares authorized	3,973,533				
Options granted	(2,048,852)	2,048,852	$ 43.29		
Options exercised	1,080 (1)	(316,813)	$ 11.33		
Options forfeited	190,378	(190,378)	$ 32.50		
Restricted stock units granted	(500,953)				
Restricted stock units withheld	72,941				
Restricted stock units forfeited	40,665				
Balances — September 30, 2023	6,408,390	9,257,155	$ 24.11	7.90	$ 248,913
Vested and expected to vest — September 30, 2023		9,257,155	$ 24.11	7.90	$ 248,913
Exercisable at September 30, 2023		4,334,997	$ 14.83	6.87	$ 156,754

(1) Net exercise – shares returned to the 401(k) Plan (as defined below).

During the three months ended September 30, 2023 and 2022, options to purchase 144,818 and 222,358 shares, respectively, were exercised for cash at a weighted-average price per share of $14.89 and $7.90, respectively. The weighted-average grant date fair value of options granted for the three months ended September 30, 2023 and 2022 was $30.65 and $18.01, respectively. The intrinsic value of the stock options exercised was $5.0 million and $4.0 million for the three months ended September 30, 2023 and 2022, respectively.

During the nine months ended September 30, 2023 and 2022, options to purchase 315,733 and 390,467 shares, respectively, were exercised for cash at a weighted-average price per share of $11.33 and $6.06, respectively. The weighted-average grant date fair value of options granted for the nine months ended September 30, 2023 and 2022 was $28.04 and $16.39, respectively. The intrinsic value of the stock options exercised was $11.3 million and $7.4 million for the nine months ended September 30, 2023 and 2022, respectively.

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 nine months ended September 30, 2023 was as follows:

	Shares	Weighted-Average Grant-Date Fair Value
Unvested at December 31, 2022	456,766	$ 26.70
Granted	500,953	43.93
Vested and released	(216,636)	30.64
Cancelled	(40,665)	40.19
Unvested at September 30, 2023	700,418	$ 37.02

The weighted-average grant date fair value of RSUs granted during the three and nine months ended September 30, 2023 was $49.82 and $43.93, respectively. The aggregate fair value of unvested RSU is calculated using the closing price of our common stock on the grant date. As of September 30, 2023, the unrecognized stock-based compensation cost of unvested RSUs was $24.3 million, which is expected to be recognized over a weighted-average period of 2.8 years.

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 will be automatically increased on the first day of each calendar year during the ten-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, 2022	1,539,314
Additional shares authorized	794,706
Shares purchased	(43,060)
Balance – September 30, 2023	2,290,960

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.

Stock-based Compensation

We estimated the fair value of employee stock options using the Black-Scholes option-pricing model for the three and nine months ended September 30, 2023 and 2022 using the following weighted-average assumptions:

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2023	2022	2023	2022
Fair Value Assumptions				
Expected volatility	71.3% - 72.1%	80.4% - 80.6%	71.3% - 74.0%	78.1% - 81.2%
Expected dividend yield	0%	0%	0%	0%
Expected term (in years)	5.4	5.5	5.3 - 5.4	5.4 - 5.5
Risk-free interest rate	4.2% - 4.4%	2.7% - 4.0%	3.5% - 4.4%	1.6% - 4.0%

We estimated the fair value of shares under the 2020 ESPP using the Black-Scholes option-pricing model for the three and nine months ended September 30, 2023 and 2022 using the following weighted-average assumptions:

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2023	2022	2023	2022
Fair Value Assumptions				
Expected volatility	74.0% - 79.6%	78.8% - 82.0%	74.0% - 99.7%	78.8% - 97.5%
Expected dividend yield	0%	0%	0%	0%
Expected term (in years)	0.5 - 2.0	0.5 - 2.0	0.5 - 2.0	0.5 - 2.0
Risk-free interest rate	4.2% - 5.4%	1.6% - 2.7%	4.2% - 5.4%	0.1% - 2.7%

We recorded total stock-based compensation expense for the three and nine months ended September 30, 2023 and 2022 related to the 2014 Plan, the 2020 Plan and the 2020 ESPP in the condensed statements of operations and allocated the amounts as follows:

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2023	2022	2023	2022
	(in thousands)		(in thousands)	
Research and development	$ 6,335	$ 2,682	$ 16,774	$ 6,804
General and administrative	6,885	3,966	18,639	9,837
Total	$ 13,220	$ 6,648	$ 35,413	$ 16,641

10. 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 three months ended September 30, 2023 and 2022, we contributed $0.3 million and $0.2 million, respectively, to the 401(k) Plan. For the nine months ended September 30, 2023 and 2022, we contributed $1.0 million and $0.5 million, respectively, to the 401(k) Plan.

11. Funding Arrangement

In July 2019, we received a cost-reimbursement research award from Combating Antibiotic Resistant Bacteria Biopharmaceutical Accelerator ("CARB-X"), a public-private partnership funded under a Cooperative Agreement from Assistant Secretary for Preparedness and Response/Biomedical Advanced Research and Development Authority ("BARDA") and by awards from Wellcome Trust, Germany's Federal Ministry of Education and Research, the United Kingdom Global Antimicrobial Resistance Innovation Fund and the Bill & Melinda Gates Foundation. In connection with this funding, we entered into a cost-reimbursement sub-award agreement with the Trustees of Boston University, the administrator of the program. The initial award provided the potential for funding up to four years to develop a universal vaccine to prevent infections caused by Group A Strep bacteria, which include pharyngitis, impetigo and necrotizing fasciitis. The initial award committed initial funding of up to $1.6 million for our VAX-A1 program and, subject to a CARB-X decision to extend the options, up to $15.1 million in total funding available upon achievement of development milestones over the next four years. Specified research expenditures are reimbursable expenses associated with agreed-upon activities needed to advance the research project supported by the grant. These expenditures can include labor, laboratory supplies, travel, consulting and third-party vendor research and development support costs. CARB-X has awarded us total funding to date of $11.7 million, with potential funding of up to $14.6 million upon the achievement of future VAX-A1 development milestones.

In April 2021, we received a cost-reimbursement research award from the National Institutes of Health ("NIH"). In connection with this funding, we entered into a cost-reimbursement sub-award agreement with the University of Maryland, Baltimore, the administrator of the program. The award provides for potential funding up to five years totaling approximately $0.5 million to develop a vaccine to prevent shigellosis, an infection caused by Shigella bacteria. VAX-GI is our novel preclinical candidate designed to prevent shigellosis and dysentry, both of which are caused by Shigella bacteria.

In June 2023, we received another cost-reimbursement research award from the NIH. In connection with this funding, we entered into an additional cost-reimbursement sub-award agreement with the University of Maryland, Baltimore, to further research on vaccine compositions to prevent shigellosis. The award 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 $1.6 million and $0.2 million of grant income under the VAX-A1 CARB-X and VAX-GI NIH awards and recorded the amounts in Other income (expense), net in the condensed statement of operations during the three months ended September 30, 2023 and 2022, respectively, and $4.8 million and $$1.0 million during the nine months ended September 30, 2023 and 2022, respectively. A grant receivable of $1.9 million and $1.0 million representing unreimbursed, eligible costs incurred under the VAX-A1 CARB-X and VAX-GI NIH agreements was recorded and included in Prepaid expenses and other current assets in the condensed balance sheets as of September 30, 2023 and December 31, 2022, respectively.

12. 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:

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2023	2022	2023	2022
Net loss (in thousands)	$ (92,664)	$ (57,917)	$ (221,465)	$ (145,435)
Weighted-average shares outstanding used in computing net loss per share, basic and diluted[(1)]	101,668,655	61,989,347	95,367,751	60,166,583
Net loss per share, basic and diluted	$ (0.91)	$ (0.93)	$ (2.32)	$ (2.42)

(1) Includes shares of common stock into which pre-funded warrants may be exercised as of September 30, 2023. See Note 8, "Pre-Funded Warrants."

The following potentially dilutive securities outstanding as of the periods presented below were excluded from the computation of diluted net loss per share for the three and nine months ended September 30, 2023 and 2022 because including them would have been anti-dilutive:

	As of September 30,	
	2023	2022
Stock options	9,293,865	7,657,799
Restricted stock units	700,418	420,167
Employee stock purchase plan shares	104,016	103,060
Total	10,098,299	8,181,026

13. Income Taxes

In determining quarterly provisions for income taxes, we use the annual estimated effective tax rate applied to the actual year-to-date profit or loss, adjusted for discrete items arising in that period. Our annual estimated effective tax rate differs from the U.S. federal statutory rate primarily as a result of state taxes and changes in our valuation allowance against our deferred tax assets. For all periods presented, we have incurred net pre-tax losses in the United States. During the three and nine months ended September 30, 2023, there were no material changes to our unrecognized tax benefits, and we do not expect to have any significant changes to unrecognized tax benefits through the end of the fiscal year. For the three and nine months ended September 30, 2023, we reported zero tax provision. We do not have any tax audits or other issues pending.

14. Subsequent Events

Lease Assignment Agreement

On September 1, 2023, we entered into the Assignment Agreement for a new operating lease for the Assumed Lease Premises. On October 1, 2023, after certain activities and requirements for the full decommissioning of the Assumed Lease Premises were completed by the assignor, the Assignment Agreement became effective and our new operating lease commenced.

Lonza 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 (the “Commercial

Manufacturing and Supply Agreement") with Lonza. Vaxcyte GmbH is represented by us until such time as Vaxcyte GmbH is incorporated and assumes 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. 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 will pay 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.

Item 2. 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 condensed financial statements and related notes and other financial information included elsewhere in this Quarterly Report on Form 10-Q and our audited financial statements and notes thereto for the year ended December 31, 2022 filed with the Securities and Exchange Commission, or the SEC, on February 27, 2023. This discussion and analysis contains 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 Quarterly Report on Form 10-Q. You should carefully read the "Risk Factors" section of this Quarterly Report on Form 10-Q 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., or 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, or PCV, candidates that we believe are among the most broad-spectrum PCV candidates currently in development, targeting the approximately $7 billion global pneumococcal vaccine market. Pneumococcal disease is an infection caused by Streptococcus pneumoniae, or pneumococcus, bacteria. It can result in invasive pneumococcal disease, or IPD, including meningitis and bacteremia, and non-invasive pneumococcal disease, including pneumonia, otitis media and sinusitis.

    - Our lead vaccine candidate, VAX-24, is a 24-valent, broad-spectrum investigational PCV being developed for the prevention of IPD. VAX-24 is intended to improve upon the standard-of-care PCV vaccines for both children and adults by covering the serotypes that are responsible for most of the pneumococcal disease currently in circulation.

        - VAX-24 Adult Program:

            - On October 24, 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 800 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 Pfizer Inc.'s, or Pfizer's, Prevnar 20®, or 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. VAX-24 met the primary safety and tolerability objectives, demonstrating a safety profile similar to PCV20, for all doses studied. In this study, VAX-24 met or exceeded the established regulatory immunogenicity standards for all 24 serotypes at the conventional 2.2mcg dose, which we intend to move forward into a Phase 3 program. At this dose, VAX-24 met the standard opsonophagocytic activity, or 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.
            - On April 17, 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 we plan to advance to Phase 3, 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, or FDA, has granted Fast Track designation and Breakthrough Therapy designation, or BTD, for VAX-24 in adults.
- 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 Biologics License Application, or 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. We plan to provide additional details on the VAX-24 adult Phase 3 program following additional regulatory discussions with the FDA focused on our chemistry, manufacturing and controls, or CMC, strategy that are expected to occur through the first quarter of 2024. We expect topline safety, tolerability and immunogenicity data from the adult Phase 3 pivotal non-inferiority study in adults in 2025.

- VAX-24 Pediatric Program:
  - On March 30, 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 approximately 48 infants in a dose-escalation approach.
  - On July 11, 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. 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 the Advisory Committee on Immunization Practices, or ACIP, in June 2023. The 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 2025, followed by topline data from the booster dose approximately nine months later.

- Our second PCV candidate, VAX-31, builds on what has been established with VAX-24 and is designed to expand the breadth of coverage to 31 strains without compromising immunogenicity due to carrier suppression. VAX-31 is a 31-valent PCV designed to provide coverage for approximately 95% of IPD currently circulating in the U.S. adult population. On October 19, 2023, we announced the FDA clearance of the investigational new drug, or IND, application for VAX-31 for the prevention of IPD in adults. We expect to initiate a Phase 1/2 clinical study in adults in the fourth quarter of 2023 and announce topline safety, tolerability and immunogenicity results in the second half of 2024.

- VAX-A1, a novel conjugate vaccine candidate designed to prevent disease caused by Group A Streptococcus, or Group A Strep. Group A Strep is pervasive globally and causes 700 million cases of illness annually, including pharyngitis, or strep throat, and certain severe invasive infections such as sepsis, necrotizing fasciitis and toxic shock syndrome. 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 the fourth quarter of 2022 and we continue to progress the program. 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 is 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 and while this is a well-appreciated antigen, others have been unable to produce it 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 National Institutes of Health research grants.

- 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 June 30, 2023, key developments affecting our business include the following:

- ***Agreed to Form Definitive Agreement with Sutro Biopharma:*** On September 28, 2023, we and Sutro Biopharma, pursuant to the Option Agreement (as defined below), mutually agreed in writing upon the Form Definitive Agreement (as defined below), to become effective in the event that we exercise our option to obtain certain exclusive rights to internally manufacture and/or source Sutro Biopharma's cell-free extract from certain contract manufacturing organizations, or 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.
- ***Received FDA Clearance for VAX-31 Adult IND Application for the Prevention of IPD:*** In October 2023, we announced FDA clearance of the VAX-31 IND application for the prevention of IPD in adults. The VAX-31 Phase 1/2 study, which will enroll approximately 1,000 adults aged 50 and older, is designed to enable us to understand the clinical potential of VAX-31 to improve upon the standard-of-care for adults by providing a broader-spectrum of protection against IPD.
- ***Expanded Collaboration with Lonza for Global Commercial Manufacturing of VAX-24 and VAX-31:*** In October 2023, we and Lonza Ltd., or Lonza, announced a new commercial manufacturing agreement, which expands the existing collaboration, to support the potential global commercialization of VAX-24 and VAX-31 in both the adult and pediatric populations. This agreement builds upon the long-standing relationship between the companies and complements our plans to utilize existing Lonza infrastructure to advance clinical development and support the anticipated initial U.S. launch of VAX-24 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 Successful End-of-Phase 2 Meeting with FDA to Inform VAX-24 Adult Phase 3 Clinical Program:*** 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 an efficacy study is therefore not required.
- ***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.

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 and 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, or 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 loss was $92.7 million for the three months ended September 30, 2023. As of September 30, 2023, we had an accumulated deficit of $743.6 million. As of September 30, 2023, we had cash, cash equivalents and investments of $1,434.2 million, which we believe will be sufficient to fund our operating expenses and capital expenditure requirements through at least the next 12 months from the filing date of this Quarterly Report on Form 10-Q.

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 and capital expenditures 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 VAX-24 Phase 3 program, as well as a potential commercial launch of VAX-24;
- 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;
- hire additional personnel;
- operate as a public company;

- 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 October 2016, we entered into a non-exclusive development and manufacturing services agreement, as amended, with Lonza, or the 2016 Lonza DMSA, pursuant to which Lonza was obligated to perform manufacturing process development and the manufacture of components for VAX-24, including the polysaccharide antigens, our proprietary eCRM protein carrier and conjugated drug substances. Subject to the terms and conditions set forth in the 2016 Lonza DMSA, Lonza 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 manufactured under the 2016 Lonza DMSA (each term as defined in the 2016 Lonza DMSA). The term of the 2016 Lonza DMSA expired on March 31, 2023.

In June 2018, we entered into a letter agreement with Lonza, or the Lonza Letter Agreement, pursuant to which we agreed to certain terms for potential future payments in shares of our common stock as partial satisfaction of future obligations to Lonza. The Lonza Letter Agreement stated that the initial pre-IND cash payments under the 2016 Lonza DMSA were subject to a specified dollar cap, or the Initial Cash Cap. After the Initial Cash Cap was reached, we had the option to make any further pre-IND payments owed to Lonza in cash, in shares of our common stock at then market prevailing prices, or a combination of both, at our election. In April 2021, we reached the Initial Cash Cap and notified Lonza that we would be exercising our option to issue approximately $10.0 million in shares of our common stock as payment for a portion of pre-IND payments due April 30, 2021. In June 2021, we issued 399,680 shares of our common stock to Lonza at a price of $25.02 per share to pay for $10.0 million of the pre-IND payments due April 30, 2021.

In October 2018, we entered into a second non-exclusive development and manufacturing services agreement with Lonza, or the 2018 Lonza DMSA, pursuant to which Lonza is obligated to perform services including manufacturing process development and the manufacture and supply of VAX-24 finished drug product. Subject to the terms and conditions set forth in the 2018 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 (each term as defined in the 2018 Lonza DMSA). Unless earlier terminated, the 2018 Lonza DMSA will remain in place for a period of five years. Either party has the right to terminate the 2018 Lonza DMSA upon a six-month notice period, provided that Lonza may not exercise such right until a specified future date. Either party has the right to terminate the 2018 Lonza DMSA if the other party commits a material breach under the applicable agreement and does not cure such breach within a given time period, for specified bankruptcy events or if a party receives a notice from the other party or otherwise becomes aware that a debarment, suspension, exclusion, sanction or declaration of ineligibility action has been brought against the other party, and we may terminate the 2018 Lonza DMSA for an extended force majeure event.

In April 2022, we entered into a third non-exclusive development and manufacturing services agreement with Lonza, as amended, or the 2022 Lonza DMSA, effective as of March 22, 2022. 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 a fourth non-exclusive development and manufacturing services agreement with Lonza, or the 2023 Lonza DMSA, effective as of March 1, 2023. 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 2016 Lonza DMSA, 2018 Lonza DMSA, 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, or Vaxcyte GmbH, a Swiss limited liability company and wholly-owned subsidiary of ours, entered into a pre-commercial services and commercial manufacturing supply agreement, or the Commercial Manufacturing and Supply Agreement, with Lonza.

Pursuant to the Commercial Manufacturing and Supply Agreement, Lonza will (i) construct and build out a dedicated suite, or 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, or 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 will pay Lonza a repurposing fee, or 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 6, "Commitments and Contingencies," to our condensed financial statements included in Part I, Item 1 of this Quarterly Report on Form 10-Q.

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.

Amended and Restated License Agreement with Sutro Biopharma

We are party to a license agreement with Sutro Biopharma, or as amended, the Sutro Biopharma License Agreement, on August 1, 2014. The Sutro Biopharma License Agreement was amended on October 12, 2015, May 9, 2018, May 29, 2018 and September 28, 2023. 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, or the Sutro Biopharma Supply Agreement, with Sutro Biopharma 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, or 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, or 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, or 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, or 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. The Option period is 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 agreed to pay 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 (which was paid in the fourth quarter of 2023). 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 elect to exercise the Option, we would 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 the event that we undergo a change of control, certain rights and payments may be accelerated.

For additional details regarding our outstanding non-cancelable purchase commitments with our manufacturing partners, see Note 6, "Commitments and Contingencies," to our condensed financial statements included in Part I, Item 1 of this Quarterly Report on Form 10-Q.

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, or 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 our costs by vaccine candidates, as our vaccine candidates are at an early stage of development and 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, scale up our manufacturing activities, establish additional manufacturing capacity to meet potential incremental supply requirements following the potential initial commercial launch of VAX-24, 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, or GMP, related standards and compliance, and identifying and qualifying second suppliers;

- the costs related to raw materials estimates from our third-party manufacturing and supply partners;
- the cost of clinical trials of our vaccine candidates being greater than we anticipate;
- 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;
- the costs that may be required for secondary supply sources; and
- the immunogenicity or efficacy and safety 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 compliance with the rules and regulations of the SEC and The Nasdaq Stock Market LLC, or Nasdaq, 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, grant income and foreign currency transaction gains (losses) related to our Swiss Franc and Euro cash and liability balances (see Note 2, “Basis of Presentation and Summary of Significant Accounting Policies” and Note 3, “Fair Value Measurements and Fair Value of Financial Instruments” to our condensed financial statements included in Part I, Item 1 of this Quarterly Report on Form 10-Q for more detail).

Grant Income

In July 2019, we received a cost-reimbursement research award from Combating Antibiotic Resistant Bacteria Biopharmaceutical Accelerator, or CARB-X, a public-private partnership funded under a Cooperative Agreement from Assistant Secretary for Preparedness and Response/Biomedical Advanced Research and Development Authority and by awards from Wellcome Trust, Germany’s Federal Ministry of Education and Research, the United Kingdom Global Antimicrobial Resistance Innovation Fund and the Bill & Melinda Gates Foundation. In connection with this funding, we entered into a cost-reimbursement sub-award agreement with the Trustees of Boston University, the administrator of the program, or the CARB-X agreement. CARB-X has awarded us total funding to date of $11.7 million, with potential funding of up to $14.6 million upon the achievement of future VAX-A1 development milestones. Separately, the National Institutes of Health, or NIH, awarded us up to $0.5 million in April 2021 to advance the development of a vaccine against Shigella infection. In June 2023, we received another cost-reimbursement research

award from the NIH which provides for up to $4.6 million of additional funding over five years to further research on vaccine compositions for treating Shigella.

Grant income pursuant to our award agreements is recognized as we incur and pay qualifying expenses over the periods of the awards. We recognized $1.6 and $0.2 million in grant income for funding research and development during the three months ended September 30, 2023 and 2022, respectively, and $4.8 million and $1.0 million during the nine months ended September 30, 2023 and 2022, respectively. Grant income is included as a component of Other income (expense), net in the condensed statements of operations.

Results of Operations

Comparison of the Three Months Ended September 30, 2023 and 2022

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

	Three Months Ended September 30,		Change	
	2023	2022	$	%
	(in thousands)			
Operating expenses:				
Research and development	$ 97,421	$ 47,679	$ 49,742	104.3 %
General and administrative	15,605	10,898	4,707	43.2 %
Total operating expenses	113,026	58,577	54,449	93.0 %
Loss from operations	(113,026)	(58,577)	(54,449)	93.0 %
Other income (expense), net:				
Interest income	18,495	1,190	17,305	*
Grant income	1,640	157	1,483	944.6 %
Foreign currency transaction gains (losses)	227	(687)	914	*
Total other income (expense), net	20,362	660	19,702	*
Net loss	$ (92,664)	$ (57,917)	$ (34,747)	60.0 %

** not meaningful*

Operating Expenses

Research and Development Expenses

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

	Three Months Ended September 30,		Change	
	2023	2022	$	%
	(in thousands)			
Product and clinical development [(1)]	$ 64,901	$ 22,034	$ 42,867	194.5 %
Personnel-related	16,699	8,957	7,742	86.4 %
Professional and consulting services	2,171	1,447	724	50.0 %
Research and development consumables	3,795	8,797	(5,002)	(56.9)%
Facility related and other allocated	5,675	4,313	1,362	31.6 %
Laboratory supplies and equipment	3,613	1,654	1,959	118.4 %
Other [(2)]	567	477	90	18.9 %
Total research and development expenses	$ 97,421	$ 47,679	$ 49,742	104.3 %

(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 $49.7 million, or 104.3%, during the three months ended September 30, 2023 compared to the corresponding period in 2022. The increase of $42.9 million in product and clinical development expenses was primarily due to (i) VAX-24 adult Phase 3 readiness activities, (ii) manufacturing readiness activities in connection with the potential future commercial launches of VAX-24 and VAX-31, (iii) VAX-A1 research and development costs and (iv) VAX-24 Phase 2 infant

clinical study costs. The increase of $7.7 million in personnel-related expenses was primarily due to higher salaries, benefits and stock-based compensation expenses resulting from the growth in the number of employees in our research and development functions and the associated increase in the number of options and restricted stock units, or RSUs, granted.

General and Administrative Expenses

General and administrative expenses increased by $4.7 million, or 43.2%, during the three months ended September 30, 2023 compared to the corresponding period in 2022. The increase was primarily due to an increase of $4.9 million in personnel-related expenses, which was related to higher salaries, benefits and stock-based compensation expenses resulting from an increase in the number of options and RSUs granted and the growth in the number of employees in our general and administrative functions, partially offset by a decrease of $0.7 million in facility and other allocated expenses.

Other Income (Expense), Net

Other income (expense), net increased by $19.7 million, during the three months ended September 30, 2023 compared to the corresponding period in 2022. The increase was primarily attributable to (i) greater interest income of $17.3 million as a result of higher cash and investment balances resulting from our follow-on offerings in 2022 and 2023 combined with an increase in the interest rates earned by such cash and investments, (ii) higher grant income of $1.5 million and (iii) lower foreign currency transaction losses of $0.9 million.

Comparison of the Nine Months Ended September 30, 2023 and 2022

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

	Nine Months Ended September 30,		Change	
	2023	2022	$	%
	(in thousands)			
Operating expenses:				
Research and development	$ 228,191	$ 117,825	$ 110,366	93.7 %
General and administrative	43,174	27,858	15,316	55.0 %
Total operating expenses	271,365	145,683	125,682	86.3 %
Loss from operations	(271,365)	(145,683)	(125,682)	86.3 %
Other income (expense), net:				
Interest expense	—	(2)	2	(100.0)%
Interest income	45,339	1,723	43,616	*
Grant income	4,759	1,006	3,753	373.1 %
Foreign currency transaction losses	(198)	(2,479)	2,281	(92.0)%
Total other income (expense), net	49,900	248	49,652	*
Net loss	$ (221,465)	$ (145,435)	$ (76,030)	52.3 %

** not meaningful*

Operating Expenses

Research and Development Expenses

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

	Nine Months Ended September 30,		Change	
	2023	2022	$	%
	(in thousands)			
Product and clinical development [(1)]	$ 139,498	$ 52,193	$ 87,305	167.3 %
Personnel-related	44,886	22,394	22,492	100.4 %
Professional and consulting services	5,566	4,153	1,413	34.0 %
Research and development consumables	12,221	20,631	(8,410)	(40.8)%
Facility related and other allocated	15,465	12,851	2,614	20.3 %
Laboratory supplies and equipment	8,455	4,028	4,427	109.9 %
Other [(2)]	2,100	1,575	525	33.3 %
Total research and development expenses	$ 228,191	$ 117,825	$ 110,366	93.7 %

(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 $110.4 million, or 93.7%, during the nine months ended September 30, 2023 compared to the corresponding period in 2022. The increases of $87.3 million in product and clinical development expenses, $4.4 million in laboratory supplies and equipment and $2.6 million in facility and other allocated expenses were primarily due to (i) VAX-24 adult Phase 3 readiness activities, (ii) VAX-A1 research and development costs, (iii) manufacturing readiness activities in connection with the potential future commercial launches of VAX-24 and VAX-31 and (iv) VAX-24 Phase 2 infant clinical study costs. The increase of $22.5 million in personnel-related expenses was primarily due to higher salaries, benefits and stock-based compensation expenses resulting from the growth in the number of employees in our research and development functions and the associated increase in the number of options and RSUs granted.

General and Administrative Expenses

General and administrative expenses increased by $15.3 million, or 55.0%, during the nine months ended September 30, 2023 compared to the corresponding period in 2022. The increase was primarily due to increases of $13.5 million in personnel-related expenses, which was related to higher salaries, benefits and stock-based compensation expenses resulting from an increase in the number of options and RSUs granted and the growth in the number of employees in our general and administrative functions, and $2.8 million in higher professional and consulting services.

Other Income (Expense), Net

Other income (expense), net increased by $49.7 million, during the nine months ended September 30, 2023 compared to the corresponding period in 2022. The increase was primarily attributable to (i) greater interest income of $43.6 million as a result of higher cash and investment balances resulting from our follow-on offerings in 2022 and 2023 combined with an increase in the interest rates earned by such cash and investments, (ii) higher grant income of $3.8 million and (iii) lower foreign currency transaction losses of $2.3 million.

Liquidity and Capital Resources

From inception through September 30, 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 $2.2 billion in aggregate gross proceeds and $2.1 billion net of underwriting discounts, commissions and offering expenses. As of September 30, 2023, we had $545.1 million in cash and cash equivalents, $889.1 million in investments and an accumulated deficit of $743.6 million.

On July 2, 2021, we filed a shelf registration statement on Form S-3ASR, or 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.

In July 2021, we entered into an Open Market Sales Agreement℠, or the Original ATM Sales Agreement with Jefferies LLC, or 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 aggregated 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 aggregated 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 September 30, 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 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, 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, including the costs associated with being a public company, further our research and development initiatives for our vaccine candidates 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 Quarterly Report on Form 10-Q will be sufficient to fund our operating expenses and capital expenditure requirements through at least 12 months from the filing date of this Quarterly Report on Form 10-Q. We have raised substantial capital, however, we will need to raise substantial additional capital to complete development 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;
- our potential exercise of the Option with Sutro Biopharma;
- 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;
- 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;
- the costs of operating as a public company; 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:

	Nine Months Ended September 30,	
	2023	2022
	(in thousands)	
Net cash used in operating activities	$ (167,980)	$ (105,376)
Net cash (used in) provided by investing activities	(759,385)	110,537
Net cash provided by financing activities	637,078	204,914
Effect of exchange rate changes on cash and cash equivalents	996	(659)
Net (decrease) increase in cash, cash equivalents and restricted cash	$ (289,291)	$ 209,416

Cash Flows from Operating Activities

Net cash used in operating activities for the nine months ended September 30, 2023 was $168 million, which primarily resulted from a net loss of $221.5 million, partially offset by non-cash charges of $10.2 million and a net change in our operating assets and liabilities of $43.3 million. Non-cash charges primarily consisted of $35.4 million in stock-based compensation expense, $5.0 million in amortization of ROU assets and $2.3 million in depreciation and amortization, partially offset by a decrease of $32.4 million in net amortization of premiums on investments. The net change in operating assets and liabilities of $43.3 million was primarily due to increases in (i) accrued manufacturing expenses of $33.6 million resulting from increased outsourced manufacturing activities, (ii) accounts payable and accrued expenses of $4.2 million resulting from the timing of payments and (iii) accrued compensation of $5.7 million related to higher headcount. These increases were partially offset by (i) a decrease in operating lease liabilities of $4.1 million related to our San Carlos office and (ii) an increase in prepaid and other assets of $3.8 million related to prepaid insurance and research costs.

Net cash used in operating activities for the nine months ended September 30, 2022 was $105.4 million, which primarily resulted from a net loss of $145.4 million, partially offset by non-cash charges of $24.0 million and a net change in our operating assets and liabilities of $16.0 million. Non-cash charges primarily consisted of $16.6 million in stock-based compensation expense, $5.0 million in amortization of ROU assets and $1.9 million in depreciation and amortization. The net change in operating assets and liabilities of $16.0 million was primarily due to (i) an increase in accrued manufacturing expenses of $5.8 million, (ii) an increase in accrued expenses of $5.5 million, (iii) an increase in operating lease liabilities of $3.0 million related to our San Carlos office and (iv) a decrease in prepaid and other current assets of $2.9 million related to prepaid insurance and research costs.

Cash Flows from Investing Activities

Cash used in investing activities for the nine months ended September 30, 2023 was $759.4 million, which was attributable primarily to $1.1 billion in purchases of investments and $10.8 million in purchases of lab equipment, partially offset by $368.9 million in maturities of investments and $8.8 million in sales of investments.

Cash provided by investing activities for the nine months ended September 30, 2022 was $110.5 million, which was attributable primarily to $136.2 million in maturities of investments and $10.5 million in sales of investments, partially offset by $31.5 million in purchases of investments and $4.7 million of purchases of lab equipment and leasehold improvements.

Cash Flows from Financing Activities

Cash provided by financing activities for the nine months ended September 30, 2023 was $637.1 million, which primarily consisted of net proceeds from our April 2023 follow-on public offering of $545.3 and under our Original and Amended ATM Sales Agreements of $90.8 million.

Cash provided by financing activities for the nine months ended September 30, 2022 was $204.9 million, which primarily consisted of net proceeds from our January 2022 follow-on public offering of $107.6 million and under our ATM Sales Agreement of $95.2 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 September 30, 2023, we had total lease payment obligations of $15.0 million, of which $6.3 million is payable within one year. These amounts do not include future lease obligations for the lease that commenced after September 30, 2023.

Option 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. Pursuant to the terms of the Option Agreement, we paid Sutro Biopharma $5.0 million within five business days of agreeing in writing upon the Form Definitive Agreement. Additionally, in the event that we elect to exercise the Option, we would pay Sutro Biopharma an aggregate Option exercise price of $75.0 million in cash in two installments and, upon the occurrence of certain potential regulatory milestones, 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 Commitments

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 condensed balance sheets as of September 30, 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 September 30, 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)**
Remainder of 2023	$ 46,324
2024	77,450
2025	1,856
2026	1,061
Total non-cancelable purchase commitments due to our key manufacturing partners	$ 126,691

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.

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 condensed financial statements, which have been prepared in accordance with accounting principles generally accepted in the United States of America. The preparation of these condensed 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 condensed 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 financial statements included elsewhere in this Quarterly Report on Form 10-Q, 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 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 9, “Equity Incentive Plans,” to our condensed financial statements included in Part I, Item 1 of this Quarterly Report on Form 10-Q 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 expected term, expected volatility, expected dividend, risk-free interest rate and fair value of common stock.

Leases

We adopted Accounting Standards Update, or 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 September 30, 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 least 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 5, “Leases,” to our condensed financial statements included in Part I, Item 1 of this Quarterly Report on Form 10-Q.

Recently Adopted Accounting Pronouncements

There were no applicable recent accounting pronouncements, and we did not adopt any new accounting standards during the quarter.

Item 3. Quantitative and Qualitative Disclosures About Market Risk.

Interest Rate Risk

Our cash and cash equivalents as of September 30, 2023 and December 31, 2022 consisted of readily available checking and money market funds. As of September 30, 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 September 30, 2023 and December 31, 2022, we had approximately $1,434.2 million and $957.9 million in cash and investments. For the three and nine months ended September 30, 2023, we had interest income of $18.5 million and $45.3 million, respectively. The following table shows the impact of a hypothetical 10% increase or decrease in interest rates on our net assets as of September 30, 2023 and our net loss for the nine months ended September 30, 2023:

Hypothetical Change in Interest Rates	Impact on Net Assets as of September 30, 2023	Impact on Net Loss for the Nine Months Ended September 30, 2023
	(in thousands)	
10% increase	$ 7,214	$ 1,502
10% decrease	$ (7,214)	$ (1,502)

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, or SVB, and appointed the Federal Deposit Insurance Corporation, or 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, or 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., or Silicon Valley Bridge Bank. On March 26, 2023, the FDIC announced that First Citizens Bank & Trust Company, or 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 contracts 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, or CHF, which is the majority of our foreign currency exposure, at market and are holding CHF in our bank accounts. As of September 30, 2023 and December 31, 2022, we had approximately $14.5 million and $21.8 million of CHF cash and cash equivalents, respectively, held at one financial institution. As of September 30, 2023 and December 31, 2022, we had foreign currency denominated accounts payable and accrued expenses of $44.4 million and $14.0 million, respectively. For the three and nine months ended September 30, 2023, we had foreign currency transaction gains of $0.2 million and foreign currency transaction losses of $0.2 million, respectively. The following table shows the impact of a hypothetical 10% increase or decrease in current exchange rates on our net assets as of September 30, 2023 and our net loss for the nine months ended September 30, 2023:

Hypothetical Change in Currency Exchange Rates	Impact on Net Assets as of September 30, 2023	Impact on Net Loss for the Nine Months Ended September 30, 2023
	(in thousands)	
10% increase	$ 5,895	$ 3,364
10% decrease	$ (5,895)	$ (3,364)

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 and if the rate of inflation were to further increase, 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 and we may utilize our capital resources sooner than expected. We do not believe inflation had a material effect on our results of operations during the periods presented.

Item 4. Controls and Procedures.

Evaluation 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 Officer, or CEO, and our Chief Financial Officer, or CFO, our principal executive officer and principal financial officer, respectively, has 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, or the Exchange Act, as of September 30, 2023. Based on this evaluation, our CEO and CFO have concluded that our disclosure controls and procedures as of September 30, 2023 were effective at the reasonable assurance level.

Changes in Internal Control over Financial Reporting

There was no change in our internal control over financial reporting, as such term is defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act, that occurred during the quarter ended September 30, 2023 that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

PART II—OTHER INFORMATION

Item 1. 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 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 Quarterly Report on Form 10-Q, including "Management's Discussion and Analysis of Financial Condition and Results of Operations" and the financial statements and 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 Quarterly Report on Form 10-Q 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 Quarterly Report on Form 10-Q.

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 four preclinical programs and one clinical program. 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 $223.5 million and $100.1 million for the years ended December 31, 2022 and 2021, respectively, and $92.7 million and $57.9 million for the three months ended September 30, 2023 and 2022, respectively. As of September 30, 2023, we had an accumulated deficit of $743.6 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 September 30, 2023, we had cash, cash equivalents and investments of $1,434.2 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 Quarterly Report on Form 10-Q. 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], or the Original ATM Sales Agreement, with Jefferies LLC, or 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 September 30, 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;
- our potential exercise of the Option (as described below) with Sutro Biopharma, Inc., or Sutro Biopharma;
- the outcome, timing and cost of seeking and obtaining regulatory approvals from the U.S. Food and Drug Administration, or 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, or 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;
- 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;
- the costs of operating as a public company; 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 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, 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., or 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, or IND, application timelines in the past and future changes or delays could impact future timelines for VAX-24 or for our other product candidates.

In addition, the preclinical and clinical trial requirements of the FDA, European Medicines Agency, or 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, or Pfizer's, Prevnar 13, or PCV13, Prevnar 20®, or PCV20 and Merck & Co., Inc.'s, or Merck's, VAXNEUVANCE™, or PCV15 and Pneumovax 23, or 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, or 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, or BLA, submission requirements. At the end of October 2023, we completed an End-of-Phase 2 meeting with the FDA to inform 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. We also expect to have discussions afforded by the Breakthrough Therapy designation granted by the FDA, including meetings regarding our CMC strategy through the first quarter of 2024. 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.

On October 19, 2023, we announced that the FDA cleared our adult IND application for VAX-31, a 31-valent PCV candidate designed to prevent IPD. We expect to initiate the VAX-31 Phase 1/2 clinical study in adults in the fourth quarter of this year and announce topline safety, tolerability and immunogenicity results in the second half 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 Strep; VAX-PG, a novel protein vaccine candidate targeting the keystone pathogen responsible for periodontitis; VAX-GI, a vaccine designed to prevent Shigella; 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, which is in clinical development, and VAX-31, which is in preclinical 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 preclinical 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, or 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, or 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 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, or 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 for their products. For example, PCV13 obtained FDA approval for the prevention of invasive pneumococcal disease, or 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, the company'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 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 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, or CMOs, including our strategic partnership with our contract manufacturer, Lonza, to access resources to facilitate the development and, if approved, commercialization of VAX-24 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, or 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. 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, or 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, including VAX-31 for IPD, VAX-A1 for Group A Strep, VAX-PG for periodontitis and VAX-GI for Shigella. 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 rely on third-party manufacturing and supply partners, including Lonza and Sutro Biopharma, to supply raw materials and components for, and 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 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 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, or Vaxcyte GmbH, a Swiss limited liability company and wholly-owned subsidiary of ours, entered into a pre-commercial services and commercial manufacturing supply agreement, or Commercial Manufacturing and Supply Agreement, with Lonza, pursuant to which Lonza will (i) construct and build out a dedicated suite, or 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, or the Option Agreement, pursuant to which we acquired, among other thing, 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. If Sutro Biopharma or the independent alternate CMO 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 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.

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:

- 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, or 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, or 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:

- 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 may seek Breakthrough Therapy designation or Fast Track designation by the FDA for one or more of our vaccine candidates, but we may not receive such designation, 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 may 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 if 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 if 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:

- 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, or 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 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:

- 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 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 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 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 vaccine candidate 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 security measures, or those maintained on our behalf by CROs, service providers or other third parties, are compromised now, or in the future, or the security, confidentiality, integrity or availability of our information technology, software, services, networks, communications or data is compromised, limited or fails, this could result in significant fines or other liability, interrupt our development programs, harm our reputation, or otherwise adversely affect our business.

In the ordinary course of our business, we collect, use, retain, safeguard, disclose, share, transfer 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, or 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.

Cyberattacks, malicious internet-based activity and online and offline fraud are prevalent and continue to increase. In addition to traditional computer "hackers"; threat actors; software bugs; malicious code (such as viruses and worms); employee error, theft or misuse; denial-of-service attacks (such as credential stuffing); advanced persistent threat intrusions; natural disasters; terrorism; war; telecommunication and electrical failures; and ransomware attacks, sophisticated nation-state and nation-state supported actors are threats to our information technology assets and data. Ransomware attacks, including those perpetrated by organized criminal threat actors, nation-states, and nation-state-supported actors, are becoming increasingly prevalent and severe 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. 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.

While we have implemented security measures designed to protect against security incidents, there can be no assurance that these measures will be effective. While we take steps to detect and remediate vulnerabilities, we may be unable in the future to detect vulnerabilities in our information technology systems because such threats and techniques change frequently, are often sophisticated in nature and may not be detected until after a security incident has occurred. 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. These vulnerabilities pose material risks to 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. While we have not experienced any such material system failure or security breach to date, if we (or a third party upon whom 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 material 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 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 protection requirements, 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.

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.

Health epidemics have impacted and could continue to impact our business, including in regions where we or third parties on which we rely have significant manufacturing facilities, concentrations of potential clinical trial sites or other business operations.

Health epidemics could adversely impact our business, including in regions where we have concentrations of potential clinical trial sites or other business operations, and cause significant disruption in the operations of our contract manufacturer and other third parties upon whom we rely. For example, the COVID-19 pandemic presented a substantial public health and economic challenge around the world and a resurgence could affect employees, patients, communities and business operations, as well as the U.S. economy and financial markets. Our headquarters is located in the San Francisco Bay Area, and our contract manufacturer, Lonza, is located in Switzerland. Many geographic regions imposed and in the future may impose, “shelter-in-place” orders, quarantines or similar orders or restrictions. The effects of these orders may negatively impact productivity, disrupt our business and delay our clinical programs and timelines, the magnitude of which will depend, in part, on the length and severity of the restrictions and other limitations on our ability to conduct our business in the ordinary course. In connection with these measures, we may be subject to claims based upon, arising out of or related to any public health epidemic and our actions and responses thereto, including any determinations that we may make to continue to operate or to re-open our facilities where permitted by applicable law. These and similar, and perhaps more severe, disruptions in our operations could negatively impact our business, financial condition, results of operations and growth prospects.

Moreover, we rely on third parties to supply raw materials and manufacture our preclinical and clinical product supplies of our vaccine candidates, and we cannot guarantee that they will continue to perform their contractual duties in a timely and satisfactory manner. In addition, public health guidelines could impact personnel at third-party manufacturing facilities in the United States and other countries, or the availability or cost of materials, which would disrupt our supply chain.

Some of our suppliers of certain materials used in the production of our vaccine candidates are located in Europe. Any manufacturing supply interruption at Lonza’s facilities in Switzerland could adversely affect our ability to produce our vaccine candidates for use in the conduct of our preclinical studies or clinical trials.

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, or 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, or NOLs, 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, or 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, or 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 impact on 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 Inflation Reduction Act of 2022 specifically introduces the topic of corporate alternative minimum tax, or CAMT, 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 its 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 net operating loss 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, 2022, we had federal and state NOL carryforwards of $340.2 million and $453.1 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, 2022, we also had federal and state research credit carryforwards of $4.4 million and $2.8 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 2022, as such we have determined that no federal research credits will expire unutilized or are excluded from our research carryforwards as of December 31, 2022. We do not expect any ownership changes during the year ended December 31, 2022 to result in a limitation that would materially reduce the total amount of net operating loss carryforwards and credits that can be utilized. 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 Option Agreement, we also 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 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, or the Option. The Option period is five years from the date of the agreement, and we have not yet exercised the Option and we may never exercise the Option. 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:

- 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 or the independent alternate CMO 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.
- 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. For example, certain policies of the Trump administration may impact our business and industry. Namely, the Trump administration took several executive actions, including the issuance of a number of Executive Orders, that could impose significant burdens on, or otherwise materially delay, the FDA's ability to engage in routine oversight activities such as implementing statutes through rulemaking, issuance of guidance and review and approval of marketing applications. It is difficult to predict how these orders will be implemented, and the extent to which they will impact the FDA's ability to exercise its regulatory authority. If these executive actions impose restrictions on the FDA's ability to engage in oversight and implementation activities in the normal course, our business may be negatively impacted. 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, or BPCIA, was enacted as part of the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act of 2010, or collectively, ACA, to establish 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, or 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, or 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, or 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, or 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, or 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 ACA was passed, which substantially changed the way healthcare is financed by both governmental and private payors in the United States. Among the provisions of the ACA, those of greatest importance to the pharmaceutical and biotechnology industries include:

- an annual, non-deductible fee on any entity that manufactures or imports certain branded prescription drugs and biologic agents, which is apportioned among these entities according to their market share in certain government healthcare programs;
- a Medicare Part D coverage gap discount program, in which manufacturers must agree to offer 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;
- an increase in the statutory minimum rebates a manufacturer must pay under the Medicaid Drug Rebate Program to 23.1% and 13.0% of the average manufacturer price for branded and generic drugs, respectively;
- a methodology by which rebates owed by manufacturers under the Medicaid Drug Rebate Program are calculated for drugs that are inhaled, infused, instilled, implanted or injected;
- extension of a manufacturer's Medicaid rebate liability to covered drugs dispensed to individuals who are enrolled in Medicaid managed care organizations;
- expansion of eligibility criteria for Medicaid programs by, among other things, allowing states to offer Medicaid coverage to certain individuals with income at or below 133% of the federal poverty level, thereby potentially increasing a manufacturer's Medicaid rebate liability;
- expansion of the entities eligible for discounts under the Public Health Service pharmaceutical pricing program;

- a requirement that certain ACA marketplace and other private payor plans include coverage for preventative services, including vaccinations recommended by the ACIP without cost share obligations (i.e., co-payments, deductibles or co-insurance) for plan members;
- a new Patient-Centered Outcomes Research Institute to oversee, identify priorities in and conduct comparative clinical effectiveness research, along with funding for such research; and
- establishment of a Center for Medicare and Medicaid Innovation at CMS, or the CMS Innovation Center to test innovative payment and service delivery models to lower Medicare and Medicaid spending, potentially including prescription drug spending.

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 Inflation Reduction Act of 2022, or 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, or 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, or APMs, and the Merit-based Incentive Payment System, or MIPS. In November 2019, CMS issued a final rule finalizing the changes to the Quality Payment Program. 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, or 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 will 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. 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 laws and regulations 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 harm our reputation, subject us to significant fines and liability, and adversely affect our business.

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.

Domestic privacy and data security laws beyond HIPAA and other healthcare privacy laws are also changing rapidly and becoming more complex. For example, the CCPA imposes obligations on businesses to which it applies. These obligations include, but are not limited to, providing specific disclosures in privacy notices and affording California residents certain rights related to their personal data. The CCPA allows for administrative fines for noncompliance (up to $7,500 per violation). 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. Other states have enacted data privacy laws that become operative in 2023, such as Virginia and Colorado, and other local, state, and federal laws are 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 whom 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).

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. Under the EU GDPR, government regulators may impose temporary or definitive bans on data processing, as well as fines of up to 20 million euros or 4% of annual global revenue, whichever is greater. Further, individuals or consumer protection organizations may initiate litigation related to our processing of their personal data.

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. For example, absent appropriate safeguards or other circumstances, the EU GDPR generally restricts the transfer of personal data to countries outside of the EEA, such as the United States, which the European Commission does not consider to be providing an adequate level of data privacy and security. The European Commission released a set of "Standard Contractual Clauses" that are designed to be a valid mechanism by which entities can transfer personal data out of the EEA to jurisdictions that the European Commission has not found to provide an adequate level of protection. Currently, these Standard Contractual clauses are a valid mechanism to transfer personal data outside of the EEA, but are subject to legal challenges. Due to these legal challenges, there exists some uncertainty regarding whether the Standard Contractual Clauses will remain a valid mechanism for transfers of personal data out of the EEA. In addition, laws in Switzerland and the UK similarly restrict transfers of personal data outside of those jurisdictions to countries such as the United States that do not provide an adequate level of personal data protection. If we need but cannot implement a valid compliance mechanism for cross-border privacy and security transfers, 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.

Our obligations related to data privacy and security 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). These obligations may necessitate changes to our information technologies, systems, and practices and to those of any third parties that process personal data on our behalf. 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 whom we rely may fail to comply with such obligations, which could negatively impact our business operations and compliance posture. For example, any failure by a third-party processor to comply with applicable law, regulations, or contractual obligations could result in adverse effects, including inability to operate our business and proceedings against us by governmental entities or others. If we 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); additional reporting requirements and/or oversight; bans on processing personal data; orders to destroy or not use personal data; and imprisonment of company officials. 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 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, or the 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 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, or the 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 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 and potentially future vaccine candidates, and we collaborate with third parties on the development of VAX-24 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 Quarterly Report on Form 10-Q, these factors include:

- 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 higher inflation rates, bank failures, changes in interest rates and the Russia-Ukraine war, 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.

As a public company, we are subject to more stringent federal and state law requirements.

As a public company, we are subject to the reporting requirements of the Exchange Act, the Sarbanes-Oxley Act, the Dodd-Frank Wall Street Reform and Consumer Protection Act, the listing requirements of The Nasdaq Stock Market LLC, or Nasdaq, and other applicable securities rules and regulations.

Sarbanes-Oxley as well as rules subsequently adopted by the SEC and Nasdaq to implement provisions of Sarbanes-Oxley, impose significant requirements on public companies, including requiring establishment and maintenance of effective disclosure and financial controls and changes in corporate governance practices. Further, pursuant to the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010, the SEC has adopted additional rules and regulations in these areas, such as mandatory “say on pay” voting requirements. Stockholder activism, the current political environment and the current high level of government intervention and regulatory reform may lead to substantial new regulations and disclosure obligations, which may lead to additional compliance costs and impact the manner in which we operate our business in ways we cannot currently anticipate. Compliance with the various reporting and other requirements applicable to public companies requires considerable time and attention of management. We cannot assure you that we will satisfy our obligations as a public company on a timely basis.

We expect the rules and regulations applicable to public companies to substantially increase our legal and financial compliance costs and to make some activities more time-consuming and costly. If we are unable to comply with these requirements on a timely basis or if the attention of our management and personnel is diverted from other business concerns, it could have a material adverse effect on our business, financial condition and results of operations. The increased costs will increase our net loss or decrease our net income, and may require us to reduce costs in other areas of our business. In addition, as we expand, it may be more difficult or more costly for us to obtain certain types of insurance, including directors’ and officers’ liability insurance, and we may be forced to accept reduced policy limits and coverage or incur substantially higher costs to obtain the same or similar coverage. The impact of these events could also make it more difficult for us to attract and retain qualified personnel to serve on our Board of Directors, our Board committees or as executive officers.

We are also subject to more stringent state law requirements. Compliance costs and penalties or other adverse impacts as a result of non-compliance (including reputational impacts) may adversely affect our business.

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, or 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 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, or 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, or 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, or SVB, and appointed the Federal Deposit Insurance Corporation, or 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, or 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., or Silicon Valley Bridge Bank. On March 26, 2023, the FDIC announced that First Citizens Bank & Trust Company, or 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.

We will continue to incur significant increased costs as a result of operating as a public company, and our management will be required to devote substantial time to new compliance initiatives.

As a public company, we will continue to incur significant legal, accounting, investor relations and other expenses that we did not incur as a private company. In addition, the Sarbanes-Oxley Act and rules subsequently implemented by the SEC and Nasdaq have imposed various requirements on public companies, including establishment and maintenance of effective disclosure and financial controls and corporate governance practices. Stockholder activism, the current political environment and the current high level of U.S. government intervention and regulatory reform may also lead to substantial new regulations and disclosure obligations, which may in turn lead to additional compliance costs and impact the manner in which we operate our business in ways we do not currently anticipate. Our management and other personnel will need to devote a substantial amount of time to comply with these requirements. Moreover, these requirements will increase our legal and financial compliance costs and will make some activities more time-consuming and costly. For example, we expect that these rules and regulations may make it more difficult and more expensive for us to obtain director and officer liability insurance.

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 2. Unregistered Sales of Equity Securities and Use of Proceeds.

(a) **Recent Sales of Unregistered Equity Securities**

None.

(b) **Use of Proceeds**

Not applicable.

(c) **Issuer Purchases of Equity Securities**

Not applicable.

Item 3. Defaults Upon Senior Securities.

Not applicable.

Item 4. Mine Safety Disclosures.

Not applicable.

Item 5. Other Information.

Trading Arrangements

During the quarter ended September 30, 2023, none of the Company's directors or Section 16 officers adopted, modified or terminated any Rule 10b5-1 trading arrangement or non-Rule 10b5-1 trading arrangement (as such terms are defined in Item 408 of Regulation S-K of the Securities Act of 1933).

Amendments to Bylaws

On November 2, 2023, the Company's Board of Directors (the "Board") approved amendments to the Company's Amended and Restated Bylaws (the "Bylaws"), which became effective the same day. Among other things, the amendments:

- update the advance notice provisions that apply where a stockholder intends to propose a director nomination or other business at a stockholder meeting, including to address Rule 14a-19 of the Exchange Act ("Rule 14a-19"), by requiring:
  - any stockholder submitting a nomination notice to make a representation as to whether such stockholder intends to solicit proxies in support of director nominees other than the Company's nominees in accordance with Rule 14a-19 and to provide reasonable evidence that certain requirements of such rule have been satisfied;
  - the nomination of each proposed director nominee other than the Company's nominees be disregarded (notwithstanding that the nominee is included as a nominee in the Company's proxy statement, notice of meeting or other proxy materials for any stockholder meeting (or any supplement thereto) and notwithstanding that proxies or votes in respect of the election of such proposed nominees may have been received by the Company (which proxies and votes shall be disregarded)) if, after a stockholder provides notice pursuant to Rule 14a-19, such stockholder

subsequently fails to comply with the requirements of Rule 14a-19 or fails to timely provide reasonable evidence that certain requirements of such rule have been satisfied;

- that the number of nominees a stockholder may nominate for election at a stockholder meeting may not exceed the number of directors to be elected at such meeting;
- certain representations with respect to a proposed nominee regarding the absence of certain voting commitments, disclosure of compensation for service and compliance with the Company's corporate governance and other policies, and intent to serve the entire term;
- additional background information and disclosures regarding proposing stockholders, proposed nominees and business, and other persons related to a stockholder's solicitation of proxies; and

- make certain other technical, modernizing and clarifying changes.

The foregoing description is a summary and is qualified in its entirety by reference to the full text of the Bylaws, a copy of which is attached as Exhibit 3.2 hereto and is incorporated by reference herein.

Item 6. Exhibits.

Exhibit Number	Description	Incorporated by Reference			
		Schedule Form	File Number	Exhibit	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.				
4.1	Form of Common Stock Certificate of the Registrant.	S-1/A	333-238630	4.1	June 8, 2020
4.2	Form of Pre-Funded Warrant.	8-K	001-39323	4.1	January 13, 2022
4.3	Form of Pre-Funded Warrant.	8-K	001-39323	4.1	October 27, 2022
4.4	Form of Pre-Funded Warrant.	8-K	001-39323	4.1	April 20, 2023
10.1#+*	Assignment and Assumption of Lease Agreement by and between the Registrant and Codexis, Inc., dated September 1, 2023.				
10.2#*	Consent to Assignment and First Amendment by and among ARE-San Francisco No. 63, LLC, Codexis, Inc. and the Registrant, dated September 6, 2023.				
10.3#+*	Third Amendment to Amended and Restated SutroVax Agreement by and between Sutro Biopharma, Inc. and the Registrant, dated September 28, 2023.				
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 Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.				
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 Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.				
32.1†*	Certification of Principal Executive Officer and Principal Financial Officer Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.				
101.INS	Inline XBRL Instance Document: the instance document does not appear in the interactive Data File because its XBRL tags are embedded within the Inline XBRL document				
101.SCH	Inline XBRL Taxonomy Extension Schema Document				
101.CAL	Inline XBRL Taxonomy Extension Calculation Linkbase Document				
101.DEF	Inline XBRL Taxonomy Extension Definition Linkbase Document				
101.LAB	Inline XBRL Taxonomy Extension Label Linkbase Document				
101.PRE	Inline XBRL Taxonomy Extension Presentation Linkbase Document				
104	Inline XBRL for the cover page of the Quarterly Report on Form 10-Q included in the Exhibit 101 Inline XBRL Document Set.				

* Filed herewith.

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.

+ 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.
† The certification attached as Exhibit 32.1 that accompanies this Quarterly Report on Form 10-Q is not deemed filed with the SEC and is not to be incorporated by reference into any filing of the Registrant 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 this Quarterly Report on Form 10-Q, irrespective of any general incorporation language contained in such filing.

SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned thereunto duly authorized.

Vaxcyte, Inc.

Date: November 6, 2023 By: /s/ Grant E. Pickering

Grant E. Pickering
Chief Executive Officer

Date: November 6, 2023 By: /s/ Andrew Guggenhime

Andrew Guggenhime
President and Chief Financial Officer

Date: November 6, 2023 By: /s/ Elvia Cowan

Elvia Cowan
Senior Vice President, Finance

EXHIBIT 3.2

AMENDED AND RESTATED BYLAWS

OF

VAXCYTE, INC.
(A DELAWARE CORPORATION)

November 2, 2023

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AMENDED AND RESTATED BYLAWS

OF

VAXCYTE, INC.
(A DELAWARE CORPORATION)

November 2, 2023

ARTICLE I

OFFICES

Section 1. Registered Office. The registered office of Vaxcyte, Inc. (the "***Corporation***") in the State of Delaware shall be 1209 Orange Street, City of Wilmington, County of New Castle 19801.

Section 2. Other Offices. The Corporation shall also have and maintain an office or principal place of business at such place as may be fixed by the board of directors of the Corporation (the "***Board of Directors***"), and may also have offices at such other places, both within and without the State of Delaware, as the Board of Directors may from time to time determine or the business of the Corporation may require.

ARTICLE II

CORPORATE SEAL

Section 3. Corporate Seal. The Board of Directors may adopt a corporate seal. If adopted, the corporate seal shall consist of a die bearing the name of the Corporation and the inscription, "Corporate Seal-Delaware." Said seal may be used by causing it or a facsimile thereof to be impressed or affixed or reproduced or otherwise.

ARTICLE III

STOCKHOLDERS' MEETINGS

Section 4. Place of Meetings. Meetings of the stockholders of the Corporation may be held at such place, either within or without the State of Delaware, as may be determined from time to time by the Board of Directors. The Board of Directors may, in its sole discretion, determine that the meeting shall not be held at any place, but may instead be held solely by means of remote communication as provided under the Delaware General Corporation Law ("***DGCL***").

Section 5. Annual Meetings.

(a) The annual meeting of the stockholders of the Corporation, for the purpose of election of directors and for such other business as may properly come before it, shall be held on such date and at such time as may be designated from time to time by the Board of Directors. Nominations of persons for election to the Board of Directors of the Corporation and the proposal of business to be considered by the stockholders may be made at an annual meeting of stockholders: (i) pursuant to the Corporation's notice of meeting of stockholders (with respect to business other than nominations); (ii) brought specifically by or at the direction of the Board of Directors; or (iii) by any stockholder of the Corporation who was a stockholder of record at the time of giving the stockholder's notice provided for in Section 5(b) below, who is entitled to vote at the meeting and who complied with the notice procedures set forth in Section 5. For the avoidance of doubt, clause (iii) above shall be the exclusive means for a stockholder to make nominations and submit other business before an annual meeting of stockholders.

(b) At an annual meeting of the stockholders, only such business shall be conducted as is a proper matter for stockholder action under Delaware law and as shall have been properly brought before the meeting.

(i) For nominations for the election to the Board of Directors to be properly brought before an annual meeting by a stockholder pursuant to clause (iii) of Section 5(a) of these Amended and Restated Bylaws (these "***Bylaws***"), the stockholder must deliver written notice to the Secretary of the Corporation at the principal executive offices of the Corporation on a timely basis as set forth in Section 5(b)(iii) and must update and supplement such written notice on a timely basis as set forth in Section 5(c). Such stockholder's notice shall set forth: (A) as to each nominee such stockholder proposes to nominate at the meeting: (1) the name, age, business address and residence address of such nominee; (2) the principal occupation or employment of such nominee; (3) the class and number of shares of each class of capital stock of the Corporation which are owned of record and beneficially by such nominee and a list of any pledge of or encumbrances on such shares; (4) the date or dates on which such shares were acquired and the investment intent of such acquisition; (5) the questionnaire, representation and agreement required by Section 5(e), completed and signed by such nominee; and (6) such other information concerning such nominee as would be required to be disclosed in a proxy statement soliciting proxies for the election of such nominee as a director in an election contest (even if an election contest is not involved), or that is otherwise required to be disclosed or provided to the Corporation pursuant to Section 14 of the Securities Exchange Act of 1934, as amended (the "***1934 Act***") and the rules and regulations promulgated thereunder (including such person's written consent to being named in a proxy statement, associated proxy card and other filings as a nominee and to serving as a director if elected); and (B) all of the information required by Section 5(b)(iv). The Corporation may require any proposed nominee to furnish such other information as it may reasonably require to determine the eligibility of such proposed nominee to serve as a director of the Corporation and to determine the independence (as such term is used in any applicable stock exchange listing requirements or applicable law) of such proposed nominee or to determine the eligibility of such proposed nominee to serve on any committee or sub-committee of the Board of Directors under any applicable stock exchange listing requirements or applicable law, or that the Board of Directors determines could be material to a reasonable stockholder's understanding of the background, qualifications, experience, independence, or lack thereof, of such proposed nominee. The number of nominees a stockholder may nominate for election at an annual meeting on its own behalf (or in the case of a stockholder giving the notice on behalf of a beneficial owner, the number of nominees a stockholder may nominate for election at an annual meeting on behalf of such beneficial owner) shall not exceed the number of directors to be elected at such annual meeting. A stockholder may not designate any substitute nominees unless the stockholder provides timely notice of such substitute nominee(s) in accordance with this Section 5, in the case of an annual meeting, or Section 6, in the case of a special meeting (and such notice contains all of the information, representations, questionnaires and certifications with respect to such substitute nominee(s) that are required by these Bylaws with respect to nominees for director).

(ii) For business other than nominations for the election to the Board of Directors to be properly brought before an annual meeting by a stockholder pursuant to clause (iii) of Section 5(a) of these Bylaws, the stockholder must deliver written notice to the Secretary of the Corporation at the principal executive offices of the Corporation on a timely basis as set forth in Section 5(b)(iii), and must update and supplement such written notice on a timely basis as set forth in Section 5(c). Such stockholder's notice shall set forth: (A) as to each matter such stockholder proposes to bring before the meeting, a brief description of the business desired to be brought before the meeting, the text of the proposal or business (including the text of any resolutions proposed for consideration and in the event that such business includes a proposal to amend these Bylaws, the language of the proposed amendment), the reasons for conducting such business at the meeting, and any material interest (including any anticipated benefit of such business to any Proponent (as defined below) other than solely as a result of its ownership of the Corporation's capital stock, that is material to any Proponent individually, or to the Proponents in the aggregate) in such business of any Proponent; and (B) the information required by Section 5(b)(iv).

(iii) To be timely, the written notice required by Section 5(b)(i) or 5(b)(ii) must be received by the Secretary of the Corporation at the principal executive offices of the Corporation not later than the close of business on the ninetieth (90th) day nor earlier than the close of business on the one hundred twentieth (120th) day prior to the first anniversary of the preceding year's annual meeting; *provided, however,* that, subject to the last sentence of this Section 5(b)(iii), in the event that the date of the annual meeting is advanced more than thirty (30) days prior to or delayed by more than thirty (30) days after the anniversary of the preceding year's annual meeting, or if no annual meeting was held (or deemed to have been held), notice by the stockholder to be timely must be so received not earlier than the close of business on the one hundred twentieth (120th) day prior to such annual meeting and not later than the close of business on the later of the ninetieth (90th) day prior to such annual meeting or the

closing of business on the tenth (10th) day following the day on which public announcement of the date of such meeting is first made. In no event shall an adjournment or a postponement of an annual meeting for which notice has been given, or the public announcement thereof has been made, commence a new time period (or extend any time period) for the giving of a stockholder's notice as described above.

(iv) The written notice required by Section 5(b)(i) or 5(b)(ii) shall also set forth, as of the date of the notice and as to the stockholder giving the notice and the beneficial owner, if any, on whose behalf the nomination or proposal is made (each, a "***Proponent***" and collectively, the "***Proponents***"): (A) the name and address of each Proponent, as they appear on the Corporation's books; (B) the class, series and number of shares of the Corporation that are, directly or indirectly, owned beneficially (within the meaning of Rule 13d-3 under the Exchange Act) and of record by each Proponent (provided, that for purposes of this Section 5(b)(iv), such Proponent shall in all events be deemed to beneficially own all shares of any class or series of capital stock of the Corporation as to which such Proponent or any of its affiliates or associates has a right to acquire beneficial ownership at any time in the future); (C) a description of any agreement, arrangement or understanding (whether oral or in writing) with respect to such nomination or proposal between or among any Proponent and any of its affiliates or associates, and any others (including their names) acting in concert, or otherwise under the agreement, arrangement or understanding, with any of the foregoing, including without limitation, any agreements, arrangements or understandings required to be disclosed pursuant to Item 5 or Item 6 of Exchange Act Schedule 13D, regardless of whether the requirement to file a Schedule 13D is applicable; (D) a representation that the Proponents are holders of record or beneficial owners, as the case may be, of shares of the Corporation at the time of giving notice, will be entitled to vote at the meeting, and intend to appear in person or by proxy duly authorized at the meeting to nominate the person or persons specified in the notice (with respect to a notice under Section 5(b)(i)) or to propose the business that is specified in the notice (with respect to a notice under Section 5(b)(ii)); (E) a representation whether any Proponent or any other participant (as defined in Item 4 of Schedule 14A under the Exchange Act) will engage in a solicitation with respect to such nomination or proposal and, if so, the name of each participant in such solicitation and the amount of the cost of solicitation that has been and will be borne, directly or indirectly, by each participant in such solicitation, and a representation as to whether the Proponents intend or are part of a group which intends (x) to deliver, or make available, a proxy statement and/or form of proxy to holders of at least the percentage of the Corporation's voting shares required to approve or adopt the proposal or elect the nominee, (y) to otherwise solicit proxies or votes from stockholders in support of such proposal or nomination and/or (z) to solicit proxies in support of any proposed nominee in accordance with Rule 14a-19 promulgated under the Exchange Act; (F) to the extent known by any Proponent, the name and address of any other stockholder supporting the proposal on the date of such stockholder's notice; (G) a description of all Derivative Transactions (as defined below) by each Proponent during the previous twelve (12) month period, including the date of the transactions and the class, series and number of securities involved in, and the material economic or voting terms of, such Derivative Transactions; (H) certification regarding whether each Proponent has complied with all applicable federal, state and other legal requirements in connection with such Proponent's acquisition of shares of capital stock or other securities of the Corporation and/or such Proponent's acts or omissions as a stockholder or beneficial owner of the Corporation; and (I) any other information relating to each Proponents required to be disclosed in a proxy statement or other filings required to be made in connection with solicitations of proxies for, as applicable, the proposal and/or for the election of directors in an election contest pursuant to and in accordance with Section 14 of the Exchange Act and the rules and regulations promulgated thereunder.

(c) A stockholder providing written notice required by Section 5(b)(i) or (ii) shall update and supplement such notice in writing, if necessary, so that the information (other than the representations required by Section 5(b)(iv)(E)) provided or required to be provided in such notice is true and correct in all material respects as of (i) the record date for the determination of stockholders entitled to notice of the meeting and (ii) the date that is five (5) business days prior to the meeting and, in the event of any adjournment or postponement thereof, five (5) business days prior to such adjourned or postponed meeting; provided, that no such update or supplement shall cure or affect the accuracy (or inaccuracy) of any representations made by any Proponent, any of its affiliates or associates or a nominee, or the validity (or invalidity) of any nomination or proposal that failed to comply with this Section 5 or is rendered invalid as a result of any inaccuracy therein. In the case of an update and supplement pursuant to clause (i) of this Section 5(c), such update and supplement shall be received by the Secretary of the Corporation at the principal executive offices of the Corporation not later than five (5) business days after the record date for the meeting. In the case of an update and supplement pursuant to clause (ii) of this Section 5(c), such update and supplement shall be received by the Secretary of the Corporation at the principal executive offices of the

Corporation not later than two (2) business days prior to the date for the meeting, and, in the event of any adjournment or postponement thereof, two (2) business days prior to such adjourned or postponed meeting.

(d) Notwithstanding anything in Section 5(b)(iii) to the contrary, in the event that the number of directors in an Expiring Class (as defined below) is increased and there is no public announcement of the appointment of a director to such class, or, if no appointment was made, of the vacancy in such class, made by the Corporation naming all of the nominees for director or specifying the size of the increased Board of Directors at least ten (10) days before the last day a stockholder may deliver a notice of nomination in accordance with Section 5(b)(iii), a stockholder's notice required by this Section 5 and which complies with the requirements in Section 5(b)(i), other than the timing requirements in Section 5(b)(iii), shall also be considered timely, but only with respect to nominees for any new positions in such Expiring Class created by such increase, if it shall be received by the Secretary of the Corporation at the principal executive offices of the Corporation not later than the close of business on the tenth (10th) day following the day on which such public announcement is first made by the Corporation. For purposes of this section, an "***Expiring Class***" shall mean a class of directors whose term shall expire at the next annual meeting of stockholders.

(e) To be eligible to be a nominee for election or re-election as a director of the Corporation pursuant to a nomination under clause (iii) of Section 5(a) or clause (ii) of Section 6(c), each Proponent must deliver (in accordance with the time periods prescribed for delivery of notice under Sections 5(b)(iii), 5(d) or 6(c), as applicable) to the Secretary at the principal executive offices of the Corporation a written questionnaire with respect to the background, qualifications, stock ownership and independence of such proposed nominee and the background of any other person or entity on whose behalf the nomination is being made (in the form provided by the Secretary within ten (10) days following a written request therefor by a stockholder of record) and a written representation and agreement (in the form provided by the Secretary within ten (10) days following written request therefor by a stockholder of record) that such person (i) is not and will not become a party to (A) any agreement, arrangement or understanding (whether oral or in writing) with, and has not given any commitment or assurance to, any person or entity as to how such person, if elected as a director of the Corporation, will act or vote on any issue or question (a "***Voting Commitment***") that has not been disclosed to the Corporation in the questionnaire or (B) any Voting Commitment that could limit or interfere with such person's ability to comply, if elected as a director of the Corporation, with such person's fiduciary duties under applicable law; (ii) is not and will not become a party to any agreement, arrangement or understanding (whether oral or in writing) with any person or entity other than the Corporation with respect to any direct or indirect compensation, reimbursement or indemnification in connection with service or action as a director of the Corporation or a nominee that has not been disclosed in such questionnaire; (iii) would be in compliance, if elected as a director of the Corporation, and will comply with, all applicable publicly disclosed corporate governance, conflict of interest, confidentiality and stock ownership and trading policies and guidelines of the Corporation; and (iv) if elected as a director of the Corporation, intends to serve the entire term until the next meeting at which such candidate would face re-election.

(f) A person shall not be eligible for election or re-election as a director unless the person is nominated, in the case of an annual meeting, in accordance with clause (ii) or (iii) of Section 5(a), and in accordance with the procedures set forth in Section 5(b), Section 5(c), Section 5(d), Section 5(e) and Section 5(f), as applicable, or in the case of a special meeting, in accordance with Section 6(c) and the requirements thereof. Only such business shall be conducted at any annual meeting of the stockholders of the Corporation as shall have been brought before the meeting in accordance with Section 5(a) and in accordance with the procedures set forth in Section 5(b), Section 5(c) and Section 5(f), as applicable. Notwithstanding anything to the contrary in these Bylaws, unless otherwise required by applicable law, in the event that any Proponent (i) provides notice pursuant to Rule 14a-19(b) promulgated under the Exchange Act with respect to one or more proposed nominees and (ii) subsequently (x) fails to comply with the requirements of Rule 14a-19 promulgated under the Exchange Act (or fails to timely provide reasonable evidence sufficient to satisfy the Corporation that such Proponent has met the requirements of Rule 14a-19(a)(3) promulgated under the Exchange Act in accordance with the next sentence) or (y) fails to inform the Corporation that they no longer plan to solicit proxies in accordance with the requirements of Rule 14a-19 under the Exchange Act by delivering a written notice to the Secretary at the principal executive offices of the Corporation within two (2) business days after the occurrence of such change, then the nomination of each such proposed nominee shall be disregarded (and such nominee disqualified from standing for election or re-election), notwithstanding that the nominee is included (as applicable) as a nominee in the Corporation's proxy statement, notice of meeting or other proxy materials for any stockholder meeting (or any supplement thereto) and

notwithstanding that proxies or votes in respect of the election of such proposed nominees may have been received by the Corporation (which proxies and votes shall be disregarded). If any Proponent provides notice pursuant to Rule 14a-19(b) promulgated under the Exchange Act, such Proponent shall deliver to the Corporation, no later than five (5) business days prior to the applicable meeting, reasonable evidence that it has met the requirements of Rule 14a-19(a)(3) promulgated under the Exchange Act. Notwithstanding anything to the contrary set forth herein, and for the avoidance of doubt, the nomination of any person whose name is included (as applicable) as a nominee in the Corporation's proxy statement, notice of meeting or other proxy materials for any stockholder meeting (or any supplement thereto) as a result of any notice provided by any Proponent pursuant to Rule 14a-19(b) promulgated under the Exchange Act with respect to such proposed nominee and whose nomination is not made by or at the direction of the Board of Directors or any authorized committee thereof shall not be deemed (for purposes of clause (i) of Section 5(a) or otherwise) to have been made pursuant to the Corporation's notice of meeting (or any supplement thereto) and any such nominee may only be nominated by a Proponent pursuant to clause (iii) of Section 5(a) and, in the case of a special meeting of stockholders, pursuant to and to the extent permitted under Section 6(c) of these Bylaws. Except as otherwise required by law, the chairperson of the meeting shall have the power and duty to determine whether a nomination or any business proposed to be brought before the meeting was made, or proposed, as the case may be, in accordance with the procedures set forth in these Bylaws (including, without limitation, compliance with Rule 14a-19 promulgated under the Exchange Act) and, if any proposed nomination or business is not in compliance with these Bylaws, or the Proponent does not act in accordance with the representations in Sections 5(b)(iv)(D) and 5(b)(iv)(E), to declare that such proposal or nomination shall not be presented for stockholder action at the meeting and shall be disregarded (and such nominee disqualified from standing for election or re-election), or that such business shall not be transacted, notwithstanding that such proposal or nomination is set forth in (as applicable) the Corporation's proxy statement, notice of meeting or other proxy materials and, notwithstanding that proxies in respect of such nominations or such business may have been solicited or received. Notwithstanding the foregoing provisions of this Section 5, unless otherwise required by applicable law, if the stockholder (or a qualified representative of the stockholder) does not appear at the annual meeting of stockholders of the Corporation to present a nomination or proposed business, such nomination shall be disregarded (and such nominee disqualified from standing for election or re-election) and such proposed business shall not be transacted, notwithstanding that such nomination or proposed business is set forth in (as applicable) the Corporation's proxy statement, notice of meeting or other proxy materials and notwithstanding that proxies or votes in respect of such vote may have been solicited or received by the Corporation. For purposes of this Section 5, to be considered a qualified representative of the stockholder, a person must be a duly authorized officer, manager, trustee or partner of such stockholder or must be authorized by a writing executed by such stockholder or an electronic transmission delivered by such stockholder to act for such stockholder as proxy at the meeting of stockholders, writing or electronic transmission, or a reliable reproduction of the writing or electronic transmission, shall be provided to the Secretary at least five (5) business days prior to the meeting of stockholders.

(g) For purposes of Sections 5 and 6,

(i) "***affiliates***" and "***associates***" shall have the meanings set forth in Rule 405 under the Securities Act of 1933, as amended (the "***1933 Act***");

(ii) "***Derivative Transaction***" means any agreement, arrangement, interest or understanding entered into by, or on behalf or for the benefit of, any Proponent or any of its affiliates or associates, whether record or beneficial:

(w) the value of which is derived in whole or in part from the value of any class or series of shares or other securities of the Corporation,

(x) which otherwise provides any direct or indirect opportunity to gain or share in any gain derived from a change in the value of securities of the Corporation,

(y) the effect or intent of which is to mitigate loss, manage risk or benefit of security value or price changes, or

(z) which provides the right to vote or increase or decrease the voting power of, such Proponent, or any of its affiliates or associates, with respect to any securities of the Corporation,

which agreement, arrangement, interest or understanding may include, without limitation, any option, warrant, debt position, note, bond, convertible security, swap, stock appreciation right, short position, profit interest, hedge, right

to dividends, voting agreement, performance-related fee or arrangement to borrow or lend shares (whether or not subject to payment, settlement, exercise or conversion in any such class or series), and any proportionate interest of such Proponent in the securities of the Corporation held by any general or limited partnership, or any limited liability company, of which such Proponent is, directly or indirectly, a general partner or managing member; and

(iii) "***public announcement***" shall mean disclosure in a press release reported by the Dow Jones News Service, Associated Press, Business Wire, GlobeNewswire or comparable national news service or in a document publicly filed by the Corporation with the Securities and Exchange Commission pursuant to Section 13, 14 or 15(d) of the 1934 Act.

Section 6. Special Meetings.

(a) Special meetings of the stockholders of the Corporation may be called, for any purpose as is a proper matter for stockholder action under Delaware law, by (i) the Chairperson of the Board of Directors, (ii) the Chief Executive Officer or the President if the Chairperson of the Board of Directors is unavailable, or (iii) the Board of Directors pursuant to a resolution adopted by a majority of the total number of authorized directors (whether or not there exist any vacancies in previously authorized directorships at the time any such resolution is presented to the Board of Directors for adoption).

(b) For a special meeting of the stockholders of the Corporation called pursuant to Section 6(a), the Board of Directors shall determine the time and place, if any, of such special meeting. Upon determination of the time and place, if any, of the meeting, the Secretary of the Corporation shall cause a notice of meeting to be given to the stockholders entitled to vote, in accordance with the provisions of Section 7 of these Bylaws. No business may be transacted at such special meeting other than as specified in the notice of meeting.

(c) Only such business (including the election of specific individuals to fill vacancies or newly created directorships on the Board of Directors) shall be conducted at a special meeting of stockholders as shall have been brought before the meeting pursuant to the Corporation's notice of meeting. Nominations of persons for election to the Board of Directors may be made at a special meeting of stockholders at which directors are to be elected (i) by or at the direction of the Board of Directors or (ii) by any stockholder of the Corporation who is a stockholder of record at the time of giving notice provided for in this paragraph, who shall be entitled to vote at the meeting and who complies with Sections 5(b)(1), 5(b)(4), 5(c), 5(e) and 5(f). The number of nominees a stockholder may nominate for election at a special meeting on its own behalf (or in the case of a stockholder giving the notice on behalf of a beneficial owner, the number of nominees a stockholder may nominate for election at a special meeting on behalf of such beneficial owner) shall not exceed the number of directors to be elected at such special meeting. In the event the Corporation calls a special meeting of stockholders for the purpose of submitting a proposal to stockholders for the election of one or more directors to the Board of Directors, any such stockholder of record entitled to vote in such election of directors may nominate a person or persons (as the case may be), for election to such position(s) as specified in the Corporation's notice of meeting, if written notice setting forth the information required by Section 5(b)(i) and 5(b)(iv) of these Bylaws shall be received by the Secretary of the Corporation at the principal executive offices of the Corporation not later than the close of business on the later of the ninetieth (90th) day prior to such meeting or the tenth (10th) day following the day on which public announcement is first made of the date of the special meeting and of the nominees proposed by the Board of Directors to be elected at such meeting. The stockholder shall also update and supplement such information as required under Section 5(c). In no event shall an adjournment or a postponement of a special meeting for which notice has been given, or the public announcement thereof has been made, commence a new time period (or extend any time period) for the giving of a stockholder's notice as described above.

(d) A person shall not be eligible for election or re-election as a director at the special meeting unless the person is nominated either in accordance with clause (i) or clause (ii) of Section 6(c). Except as otherwise required by applicable law, the chairperson of the meeting shall have the power and duty to determine whether a nomination was made in accordance with the procedures and requirements set forth in these Bylaws and, if any proposed nomination is not in compliance with these Bylaws (including, without limitation, compliance with Rule 14a-19 under the Exchange Act), or if the Proponent does not act in accordance with the representations required in Section 5, to declare that such nomination shall not be presented for stockholder action at the meeting and shall be

disregarded (and such nominee disqualified from standing for election or re-election), notwithstanding that such nomination is set forth in (as applicable) the Corporation's proxy statement, notice of meeting or other proxy materials and notwithstanding that proxies or votes in respect of such nomination may have been solicited or received. Notwithstanding the foregoing provisions of this Section 6, unless otherwise required by applicable law, if the stockholder (or a qualified representative of the stockholder (meeting the requirements specified in Section 5(f)) does not appear at the special meeting of stockholders of the Corporation to present a nomination, such nomination shall be disregarded (and such nominee disqualified from standing for election or re-election), notwithstanding that the nomination is set forth (as applicable) in the Corporation's proxy statement, notice of meeting or other proxy materials and notwithstanding that proxies or votes in respect of such nomination may have been solicited or received by the Corporation.

(d) Notwithstanding the foregoing provisions of this Section 6, a stockholder must also comply with all applicable requirements of the 1934 Act and the rules and regulations thereunder with respect to matters set forth in this Section 6. Nothing in these Bylaws shall be deemed to affect any rights of stockholders to request inclusion of proposals in the Corporation's proxy statement pursuant to Rule 14a-8 under the 1934 Act; *provided, however,* that any references in these Bylaws to the 1934 Act or the rules and regulations thereunder are not intended to and shall not limit the requirements applicable to nominations for the election to the Board of Directors to be considered pursuant to Section 6(c) of these Bylaws.

Section 7. Notice of Meetings. Except as otherwise provided by law, notice, given in writing or by electronic transmission, of each meeting of stockholders shall be given not less than ten (10) nor more than sixty (60) days before the date of the meeting to each stockholder entitled to vote at such meeting, such notice to specify the place, if any, date and hour, in the case of special meetings, the purpose or purposes of the meeting, and the means of remote communications, if any, by which stockholders and proxy holders may be deemed to be present in person and vote at any such meeting. If mailed, notice is given when deposited in the United States mail, postage prepaid, directed to the stockholder at such stockholder's address as it appears on the records of the Corporation. If sent via electronic transmission, notice is given as of the sending time recorded at the time of transmission. Notice of the time, place, if any, and purpose of any meeting of stockholders (to the extent required) may be waived in writing, signed by the person entitled to notice thereof, or by electronic transmission by such person, either before or after such meeting, and will be waived by any stockholder by his or her attendance thereat in person, by remote communication, if applicable, or by proxy duly authorized, except when the stockholder attends a meeting for the express purpose of objecting, at the beginning of the meeting, to the transaction of any business because the meeting is not lawfully called or convened. Any stockholder so waiving notice of such meeting shall be bound by the proceedings of any such meeting in all respects as if due notice thereof had been given.

Section 8. Quorum. At all meetings of stockholders, except where otherwise provided by statute or by the Amended and Restated Certificate of Incorporation, or by these Bylaws, the presence, in person, by remote communication, if applicable, or by proxy duly authorized, of the holders of a majority of the voting power of the outstanding shares of stock entitled to vote shall constitute a quorum for the transaction of business. In the absence of a quorum, any meeting of stockholders may be adjourned, from time to time, either by the chairperson of the meeting or by vote of the holders of a majority of the voting power of the shares represented thereat, but no other business shall be transacted at such meeting. The stockholders present at a duly called or convened meeting, at which a quorum is present, may continue to transact business until adjournment, notwithstanding the withdrawal of enough stockholders to leave less than a quorum. Except as otherwise provided by statute, by the Amended and Restated Certificate of Incorporation or these Bylaws, or by applicable stock exchange rules, in all matters other than the election of directors, the affirmative vote of the holders of a majority of the voting power of the shares present in person, by remote communication, if applicable, or represented by proxy duly authorized at the meeting and entitled to vote generally on the subject matter shall be the act of the stockholders. Except as otherwise provided by statute, by the Amended and Restated Certificate of Incorporation or these Bylaws, or by applicable stock exchange rules, directors shall be elected by a plurality of the votes of the shares present in person, by remote communication, if applicable, or represented by proxy duly authorized at the meeting and entitled to vote generally on the election of directors. Where a separate vote by a class or classes or series is required, except where otherwise provided by statute, by the Amended and Restated Certificate of Incorporation or these Bylaws, or by applicable stock exchange rules, a majority of the voting power of the outstanding shares of such class or classes or series, present in person, by remote communication, if applicable, or represented by proxy duly authorized, shall constitute a quorum entitled to take action with respect to that vote on that matter. Except as otherwise provided by statute, by

the Amended and Restated Certificate of Incorporation or these Bylaws, or by applicable stock exchange rules, the affirmative vote of the holders of a majority (plurality, in the case of the election of directors) of shares of such class or classes or series present in person, by remote communication, if applicable, or represented by proxy duly authorized at the meeting shall be the act of such class or classes or series.

Section 9. Adjournment and Notice of Adjourned Meetings. Any meeting of stockholders, whether annual or special, may be adjourned from time to time either by the chairperson of the meeting or by the vote of the holders of a majority of the voting power of the shares present in person, by remote communication, if applicable, or represented by proxy duly authorized at the meeting. When a meeting is adjourned to another time or place, if any, notice need not be given of the adjourned meeting if the time and place, if any, thereof are announced at the meeting at which the adjournment is taken. At the adjourned meeting, the Corporation may transact any business that might have been transacted at the original meeting. If the adjournment is for more than thirty (30) days or if after the adjournment a new record date is fixed for the adjourned meeting, a notice of the adjourned meeting shall be given to each stockholder of record entitled to vote at the meeting.

Section 10. Voting Rights. For the purpose of determining those stockholders entitled to vote at any meeting of the stockholders, except as otherwise provided by law, only persons in whose names shares stand on the stock records of the Corporation on the record date, as provided in Section 12 of these Bylaws, shall be entitled to vote at any meeting of stockholders. Every person entitled to vote shall have the right to do so either in person, by remote communication, if applicable, or by an agent or agents authorized by a proxy granted in accordance with Delaware law. An agent so appointed need not be a stockholder. No proxy shall be voted after three (3) years from its date of creation unless the proxy provides for a longer period.

Section 11. Joint Owners of Stock. If shares or other securities having voting power stand of record in the names of two (2) or more persons, whether fiduciaries, members of a partnership, joint tenants, tenants in common, tenants by the entirety, or otherwise, or if two (2) or more persons have the same fiduciary relationship respecting the same shares, unless the Secretary of the Corporation is given written notice to the contrary and is furnished with a copy of the instrument or order appointing them or creating the relationship wherein it is so provided, their acts with respect to voting shall have the following effect: (a) if only one (1) votes, his or her act binds all; (b) if more than one (1) votes, the act of the majority so voting binds all; (c) if more than one (1) votes, but the vote is evenly split on any particular matter, each faction may vote the securities in question proportionally, or may apply to the Delaware Court of Chancery for relief as provided in the DGCL, Section 217(b). If the instrument filed with the Secretary of the Corporation shows that any such tenancy is held in unequal interests, a majority or even-split for the purpose of subsection (c) of this Section 11 shall be a majority or even-split in interest.

Section 12. List of Stockholders. The Secretary of the Corporation shall prepare and make, at least ten (10) days before every meeting of stockholders, a complete list of the stockholders entitled to vote at said meeting, arranged in alphabetical order, showing the address of each stockholder and the number and class of shares registered in the name of each stockholder. Such list shall be open to the examination of any stockholder, for any purpose germane to the meeting, (a) on a reasonably accessible electronic network, provided that the information required to gain access to such list is provided with the notice of the meeting, or (b) during ordinary business hours, at the principal place of business of the Corporation. In the event that the Corporation determines to make the list available on an electronic network, the Corporation may take reasonable steps to ensure that such information is available only to stockholders of the Corporation.

Section 13. Action Without Meeting. Unless otherwise provided in the Amended and Restated Certificate of Incorporation, no action shall be taken by the stockholders of the Corporation except at an annual or special meeting of stockholders called in accordance with these Bylaws, and no action of the stockholders of the Corporation shall be taken by written consent or electronic transmission.

Section 14. Organization.

(a) At every meeting of stockholders, the Chairperson of the Board of Directors, or, if a Chairperson has not been appointed or is absent, the Chief Executive Officer, or if no Chief Executive Officer is then serving or is absent, the President, or, if the President is absent, a chairperson of the meeting chosen by a majority in interest of

the stockholders entitled to vote, present in person or by proxy duly authorized, shall act as chairperson. The Chairperson of the Board of Directors may appoint the Chief Executive Officer as chairperson of the meeting. The Secretary of the Corporation, or, in his or her absence, an Assistant Secretary of the Corporation or other officer or other person directed to do so by the chairperson of the meeting, shall act as secretary of the meeting.

(b) The Board of Directors of the Corporation shall be entitled to make such rules or regulations for the conduct of meetings of stockholders as it shall deem necessary, appropriate or convenient. Subject to such rules and regulations of the Board of Directors, if any, the chairperson of the meeting shall have the right and authority to prescribe such rules, regulations and procedures and to do all such acts as, in the judgment of such chairperson, are necessary, appropriate or convenient for the proper conduct of the meeting, including, without limitation, establishing an agenda or order of business for the meeting, rules and procedures for maintaining order at the meeting and the safety of those present, limitations on participation in such meeting to stockholders of record of the Corporation and their duly authorized and constituted proxies and such other persons as the chairperson shall permit, restrictions on entry to the meeting after the time fixed for the commencement thereof, limitations on the time allotted to questions or comments by participants and regulation of the opening and closing of the polls for balloting on matters which are to be voted on by ballot. The date and time of the opening and closing of the polls for each matter upon which the stockholders will vote at the meeting shall be announced at the meeting. Unless and to the extent determined by the Board of Directors or the chairperson of the meeting, meetings of stockholders shall not be required to be held in accordance with rules of parliamentary procedure.

ARTICLE IV

DIRECTORS

Section 15. Number and Term of Office. The authorized number of directors of the Corporation shall be fixed in accordance with the Amended and Restated Certificate of Incorporation. Directors need not be stockholders unless so required by the Amended and Restated Certificate of Incorporation. If for any cause, the directors shall not have been elected at an annual meeting, they may be elected as soon thereafter as convenient at a special meeting of the stockholders called for that purpose in the manner provided in these Bylaws.

Section 16. Powers. The business and affairs of the Corporation shall be managed by or under the direction of the Board of Directors, except as may be otherwise provided by statute or by the Amended and Restated Certificate of Incorporation.

Section 17. Classes of Directors. Subject to the rights of the holders of any series of Preferred Stock to elect additional directors under specified circumstances, the directors shall be divided into three classes designated as Class I, Class II and Class III, respectively. At each annual meeting of stockholders, directors shall be elected for a full term of three years to succeed the directors of the class whose terms expire at such annual meeting.

Notwithstanding the foregoing provisions of this Section 17, each director shall serve until his or her successor is duly elected and qualified or until his or her earlier death, resignation or removal. No decrease in the number of directors constituting the Board of Directors shall shorten the term of any incumbent director.

Section 18. Vacancies. Unless otherwise provided in the Amended and Restated Certificate of Incorporation, and subject to the rights of the holders of any series of Preferred Stock or as otherwise provided by applicable law, any vacancies on the Board of Directors resulting from death, resignation, disqualification, removal or other causes and any newly created directorships resulting from any increase in the number of directors shall, unless the Board of Directors determines by resolution that any such vacancies or newly created directorships shall be filled by stockholders, be filled only by the affirmative vote of a majority of the directors then in office, even though less than a quorum of the Board of Directors, or by a sole remaining director, and not by the stockholders, *provided, however*, that whenever the holders of any class or classes of stock or series thereof are entitled to elect one or more directors by the provisions of the Amended and Restated Certificate of Incorporation, vacancies and newly created directorships of such class or classes or series shall, unless the Board of Directors determines by resolution that any such vacancies or newly created directorships shall be filled by stockholders, be filled by a majority of the directors elected by such class or classes or series thereof then in office, or by a sole remaining director so elected, and not by

the stockholders. Any director elected in accordance with the preceding sentence shall hold office for the remainder of the full term of the director for which the vacancy was created or occurred and until such director's successor shall have been elected and qualified. A vacancy in the Board of Directors shall be deemed to exist under this Bylaw in the case of the death, removal or resignation of any director.

Section 19. Resignation. Any director may resign at any time by delivering his or her notice in writing or by electronic transmission to the Secretary of the Corporation, such resignation to specify whether it will be effective at a particular time. If no such specification is made, the Secretary of the Corporation, in his or her discretion, may either (a) require confirmation from the director prior to deeming the resignation effective, in which case the resignation will be deemed effective upon receipt of such confirmation, or (b) deem the resignation effective at the time of delivery of the resignation to the Secretary of the Corporation. When one or more directors shall resign from the Board of Directors, effective at a future date, a majority of the directors then in office, including those who have so resigned, shall have power to fill such vacancy or vacancies, the vote thereon to take effect when such resignation or resignations shall become effective, and each director so chosen shall hold office for the unexpired portion of the term of the director whose place shall be vacated and until his or her successor shall have been duly elected and qualified.

Section 20. Removal. Subject to any limitation imposed by applicable law, any individual director or directors may be removed from office with cause by the affirmative vote of the holders of at least sixty-six and two-thirds percent (66 2/3%) of the voting power of all then outstanding shares of capital stock of the Corporation entitled to vote generally at an election of directors, voting together as a single class.

Section 21. Meetings.

(a) Regular Meetings. Unless otherwise restricted by the Amended and Restated Certificate of Incorporation, regular meetings of the Board of Directors may be held at any time or date and at any place within or without the State of Delaware which has been designated by the Board of Directors and publicized among all directors, either orally or in writing, by telephone, including a voice-messaging system or other system designed to record and communicate messages, facsimile, telegraph or telex, or by electronic mail or other electronic means. No further notice shall be required for regular meetings of the Board of Directors.

(b) Special Meetings. Unless otherwise restricted by the Amended and Restated Certificate of Incorporation, special meetings of the Board of Directors may be held at any time and place within or without the State of Delaware whenever called by the Chairperson of the Board of Directors, the Chief Executive Officer or a majority of the total number of authorized directors.

(c) Meetings by Electronic Communications Equipment. Any member of the Board of Directors, or of any committee thereof, may participate in a meeting by means of conference telephone or other communications equipment by means of which all persons participating in the meeting can hear each other, and participation in a meeting by such means shall constitute presence in person at such meeting.

(d) Notice of Special Meetings. Notice of the time and place of all special meetings of the Board of Directors shall be orally or in writing, by telephone, including a voice messaging system or other system or technology designed to record and communicate messages, facsimile, telegraph or telex, or by electronic mail or other electronic means, during normal business hours, at least twenty-four (24) hours before the date and time of the meeting. If notice is sent by U.S. mail, it shall be sent by first class mail, postage prepaid, at least three (3) days before the date of the meeting. Notice of any meeting may be waived in writing, or by electronic transmission, at any time before or after the meeting and will be waived by any director by attendance thereat, except when the director attends the meeting for the express purpose of objecting, at the beginning of the meeting, to the transaction of any business because the meeting is not lawfully called or convened.

(e) Waiver of Notice. The transaction of all business at any meeting of the Board of Directors, or any committee thereof, however called or noticed, or wherever held, shall be as valid as though it had been transacted at a meeting duly held after regular call and notice, if a quorum be present and if, either before or after the meeting, each of the directors not present who did not receive notice shall sign a written waiver of notice or shall waive notice

by electronic transmission. All such waivers shall be filed with the corporate records or made a part of the minutes of the meeting.

Section 22. Quorum and Voting.

(a) Unless the Amended and Restated Certificate of Incorporation requires a greater number, and except with respect to questions related to indemnification arising under Section 44 for which a quorum shall be one-third of the exact number of directors fixed from time to time, a quorum of the Board of Directors shall consist of a majority of the exact number of directors fixed from time to time by the Board of Directors in accordance with the Amended and Restated Certificate of Incorporation; *provided, however,* at any meeting whether a quorum be present or otherwise, a majority of the directors present may adjourn from time to time until the time fixed for the next regular meeting of the Board of Directors, without notice other than by announcement at the meeting.

(b) At each meeting of the Board of Directors at which a quorum is present, all questions and business shall be determined by the affirmative vote of a majority of the directors present, unless a different vote be required by law, the Amended and Restated Certificate of Incorporation or these Bylaws.

Section 23. Action Without Meeting. Unless otherwise restricted by the Amended and Restated Certificate of Incorporation or these Bylaws, any action required or permitted to be taken at any meeting of the Board of Directors or of any committee thereof may be taken without a meeting, if all members of the Board of Directors or committee, as the case may be, consent thereto in writing or by electronic transmission, and such writing or writings or transmission or transmissions are filed with the minutes of proceedings of the Board of Directors or committee. Such filing shall be in paper form if the minutes are maintained in paper form and shall be in electronic form if the minutes are maintained in electronic form.

Section 24. Fees and Compensation. Directors shall be entitled to such compensation for their services as may be approved by the Board of Directors, including, if so approved, by resolution of the Board of Directors, a fixed sum and expenses of attendance, if any, for attendance at each regular or special meeting of the Board of Directors and at any meeting of a committee of the Board of Directors. Nothing herein contained shall be construed to preclude any director from serving the Corporation in any other capacity as an officer, agent, employee, or otherwise and receiving compensation therefor.

Section 25. Committees.

(a) Executive Committee. The Board of Directors may appoint an Executive Committee to consist of one (1) or more members of the Board of Directors. The Executive Committee, to the extent permitted by law and provided in the resolution of the Board of Directors shall have and may exercise all the powers and authority of the Board of Directors in the management of the business and affairs of the Corporation, and may authorize the seal of the Corporation to be affixed to all papers which may require it; but no such committee shall have the power or authority in reference to (i) approving or adopting, or recommending to the stockholders, any action or matter (other than the election or removal of directors) expressly required by the DGCL to be submitted to stockholders for approval, or (ii) adopting, amending or repealing any Bylaw of the Corporation.

(b) Other Committees. The Board of Directors may, from time to time, appoint such other committees as may be permitted by law. Such other committees appointed by the Board of Directors shall consist of one (1) or more members of the Board of Directors and shall have such powers and perform such duties as may be prescribed by the resolution or resolutions creating such committees, but in no event shall any such committee have the power or authority denied to the Executive Committee in these Bylaws.

(c) Term. The Board of Directors, subject to any requirements of any outstanding series of Preferred Stock and the provisions of subsections (a) or (b) of this Section 25, may at any time increase or decrease the number of members of a committee or terminate the existence of a committee. The membership of a committee member shall terminate on the date of his or her death or voluntary resignation from the committee or from the Board of Directors. The Board of Directors may at any time for any reason remove any individual committee member and the Board of Directors may fill any committee vacancy created by death, resignation, removal or

increase in the number of members of the committee. The Board of Directors may appoint one or more directors as alternate members of any committee, who may replace any absent or disqualified member at any meeting of the committee, and, in addition, in the absence or disqualification of any member of a committee, the member or members thereof present at any meeting and not disqualified from voting, whether or not he, she or they constitute a quorum, may unanimously appoint another member of the Board of Directors to act at the meeting in the place of any such absent or disqualified member.

(d) Meetings. Unless the Board of Directors shall otherwise provide, regular meetings of the Executive Committee or any other committee appointed pursuant to this Section 25 shall be held at such times and places as are determined by the Board of Directors, or by any such committee, and when notice thereof has been given to each member of such committee, no further notice of such regular meetings need be given thereafter. Special meetings of any such committee may be held at any place which has been determined from time to time by such committee, and may be called by any director who is a member of such committee, upon notice to the members of such committee of the time and place of such special meeting given in the manner provided for the giving of notice to members of the Board of Directors of the time and place of special meetings of the Board of Directors. Notice of any special meeting of any committee may be waived in writing or by electronic transmission at any time before or after the meeting and will be waived by any director by attendance thereat, except when the director attends such special meeting for the express purpose of objecting, at the beginning of the meeting, to the transaction of any business because the meeting is not lawfully called or convened. Unless otherwise provided by the Board of Directors in the resolutions authorizing the creation of the committee, a majority of the authorized number of members of any such committee shall constitute a quorum for the transaction of business, and the act of a majority of those present at any meeting at which a quorum is present shall be the act of such committee. Unless the Board of Directors shall otherwise provide, each committee shall conduct its business in the same manner as the Board of Directors conducts its business pursuant to Article IV of these Bylaws.

Section 26. Duties of Chairperson of the Board of Directors and Lead Independent Director.

(a) The Chairperson of the Board of Directors, if appointed and when present, shall preside at all meetings of the stockholders and the Board of Directors. The Chairperson of the Board of Directors shall perform other duties commonly incident to the office and shall also perform such other duties and have such other powers, as the Board of Directors shall designate from time to time.

(b) The Chairperson of the Board of Directors, or if the Chairperson is not an independent director, one of the independent directors, may be designated by the Board of Directors as lead independent director to serve until replaced by the Board of Directors (the "***Lead Independent Director***"). The Lead Independent Director will, with the Chairperson of the Board of Directors and the Chief Executive Officer, establish the agenda for regular Board of Directors meetings and serve as chairperson of the Board of Directors meetings in the absence of the Chairperson of the Board of Directors; establish the agenda for meetings of the independent directors and preside over such meetings; coordinate with the committee chairs regarding meeting agendas and informational requirements; preside over any portions of meetings of the Board of Directors at which the evaluation or compensation of the Chief Executive Officer is presented or discussed; preside over any portions of any meetings of the Board of Directors at which the performance of the Board of Directors is presented or discussed; and perform such other duties as may be established or delegated by the Board of Directors.

Section 27. Organization. At every meeting of the directors, the Chairperson of the Board of Directors, or, if a Chairperson has not been appointed or is absent, the Lead Independent Director, or if the Lead Independent Director has not been appointed or is absent, the Chief Executive Officer (if a director), or, if a Chief Executive Officer is absent, the President (if a director), or if the President is absent, the most senior Vice President (if a director), or, in the absence of any such person, a chairperson of the meeting chosen by a majority of the directors present, shall preside over the meeting. The Secretary of the Corporation, or in his or her absence, any Assistant Secretary of the Corporation or other officer, director or other person directed to do so by the person presiding over the meeting, shall act as secretary of the meeting.

ARTICLE V

OFFICERS

Section 28. Officers Designated. The officers of the Corporation shall include, if and when designated by the Board of Directors, the Chief Executive Officer, the President, one or more Vice Presidents, the Secretary, the Chief Financial Officer and the Treasurer. The Board of Directors may also appoint one or more Assistant Secretaries and Assistant Treasurers and such other officers and agents with such powers and duties as it shall deem necessary. The Board of Directors may assign such additional titles to one or more of the officers as it shall deem appropriate. Any one person may hold any number of offices of the Corporation at any one time unless specifically prohibited therefrom by law. The salaries and other compensation of the officers of the Corporation shall be fixed by or in the manner designated by the Board of Directors or a committee thereof to which the Board of Directors has delegated such responsibility.

Section 29. Tenure and Duties of Officers.

(a) General. All officers shall hold office at the pleasure of the Board of Directors and until their successors shall have been duly elected and qualified, unless sooner removed. Any officer elected or appointed by the Board of Directors may be removed at any time by the Board of Directors. If the office of any officer becomes vacant for any reason, the vacancy may be filled by the Board of Directors.

(b) Duties of Chief Executive Officer. The Chief Executive Officer shall preside at all meetings of the stockholders and at all meetings of the Board of Directors (if a director), unless the Chairperson of the Board of Directors or the Lead Independent Director has been appointed and is present. Unless an officer has been appointed Chief Executive Officer of the Corporation, the President shall be the chief executive officer of the Corporation and shall, subject to the control of the Board of Directors, have general supervision, direction and control of the business and officers of the Corporation. To the extent that a Chief Executive Officer has been appointed and no President has been appointed, all references in these Bylaws to the President shall be deemed references to the Chief Executive Officer. The Chief Executive Officer shall perform other duties commonly incident to the office and shall also perform such other duties and have such other powers, as the Board of Directors shall designate from time to time.

(c) Duties of President. The President shall preside at all meetings of the stockholders and at all meetings of the Board of Directors (if a director), unless the Chairperson of the Board of Directors, the Lead Independent Director or the Chief Executive Officer has been appointed and is present. Unless another officer has been appointed Chief Executive Officer of the Corporation, the President shall be the chief executive officer of the Corporation and shall, subject to the control of the Board of Directors, have general supervision, direction and control of the business and officers of the Corporation. The President shall perform other duties commonly incident to the office and shall also perform such other duties and have such other powers, as the Board of Directors shall designate from time to time.

(d) Duties of Vice Presidents. A Vice President may assume and perform the duties of the President in the absence or disability of the President or whenever the office of President is vacant. A Vice President shall perform other duties commonly incident to their office and shall also perform such other duties and have such other powers as the Board of Directors or the Chief Executive Officer, or, if the Chief Executive Officer has not been appointed or is absent, the President shall designate from time to time.

(e) Duties of Secretary. The Secretary of the Corporation shall attend all meetings of the stockholders and of the Board of Directors and shall record all acts and proceedings thereof in the minute book of the Corporation. The Secretary of the Corporation shall give notice in conformity with these Bylaws of all meetings of the stockholders and of all meetings of the Board of Directors and any committee thereof requiring notice. The Secretary of the Corporation shall perform all other duties provided for in these Bylaws and other duties commonly incident to the office and shall also perform such other duties and have such other powers, as the Board of Directors shall designate from time to time. The Chief Executive Officer, or if no Chief Executive Officer is then serving, the President may direct any Assistant Secretary of the Corporation or other officer to assume and perform the duties of the Secretary in the absence or disability of the Secretary, and each Assistant Secretary of the Corporation shall

perform other duties commonly incident to the office and shall also perform such other duties and have such other powers as the Board of Directors or the Chief Executive Officer, or if no Chief Executive Officer is then serving, the President shall designate from time to time.

(f) Duties of Chief Financial Officer. The Chief Financial Officer shall keep or cause to be kept the books of account of the Corporation in a thorough and proper manner and shall render statements of the financial affairs of the Corporation in such form and as often as required by the Board of Directors or the Chief Executive Officer, or if no Chief Executive officer is then serving, the President. The Chief Financial Officer, subject to the order of the Board of Directors, shall have the custody of all funds and securities of the Corporation. The Chief Financial Officer shall perform other duties commonly incident to the office and shall also perform such other duties and have such other powers as the Board of Directors or the Chief Executive Officer, or if no Chief Executive Officer is then serving, the President shall designate from time to time. To the extent that a Chief Financial Officer has been appointed and no Treasurer has been appointed, all references in these Bylaws to the Treasurer shall be deemed references to the Chief Financial Officer. The President may direct the Treasurer, if any, or any Assistant Treasurer, or the controller or any assistant controller to assume and perform the duties of the Chief Financial Officer in the absence or disability of the Chief Financial Officer, and each Treasurer and Assistant Treasurer and each controller and assistant controller shall perform other duties commonly incident to the office and shall also perform such other duties and have such other powers as the Board of Directors or the Chief Executive Officer, or if no Chief Executive Officer is then serving, the President shall designate from time to time.

(g) Duties of Treasurer. Unless another officer has been appointed Chief Financial Officer of the Corporation, the Treasurer shall be the chief financial officer of the Corporation and shall keep or cause to be kept the books of account of the Corporation in a thorough and proper manner and shall render statements of the financial affairs of the Corporation in such form and as often as required by the Board of Directors or the Chief Executive Officer, or if no Chief Executive Officer is then serving, the President, and, subject to the order of the Board of Directors, shall have the custody of all funds and securities of the Corporation. The Treasurer shall perform other duties commonly incident to the office and shall also perform such other duties and have such other powers as the Board of Directors or the Chief Executive Officer, or if no Chief Executive Officer is then serving, the President and the Chief Financial Officer (if not Treasurer) shall designate from time to time.

Section 30. Delegation of Authority. The Board of Directors may from time to time delegate the powers or duties of any officer to any other officer or agent, notwithstanding any provision hereof.

Section 31. Resignations. Any officer may resign at any time by giving notice in writing or by electronic transmission to the Board of Directors or to the Chief Executive Officer, or if no Chief Executive Officer is then serving, the President or to the Secretary of the Corporation. Any such resignation shall be effective when received by the person or persons to whom such notice is given, unless a later time is specified therein, in which event the resignation shall become effective at such later time. Unless otherwise specified in such notice, the acceptance of any such resignation shall not be necessary to make it effective. Any resignation shall be without prejudice to the rights, if any, of the Corporation under any contract with the resigning officer.

Section 32. Removal. Any officer may be removed from office at any time, either with or without cause, by the affirmative vote of a majority of the directors in office at the time, or by the unanimous written consent of the directors in office at the time, or by any committee or by the Chief Executive Officer or by other superior officers upon whom such power of removal may have been conferred by the Board of Directors.

ARTICLE VI

EXECUTION OF CORPORATE INSTRUMENTS AND VOTING OF SECURITIES OWNED BY THE CORPORATION

Section 33. Execution of Corporate Instruments. The Board of Directors may, in its discretion, determine the method and designate the signatory officer or officers, or other person or persons, to execute on behalf of the Corporation any corporate instrument or document, or to sign on behalf of the Corporation the corporate name

without limitation, or to enter into contracts on behalf of the Corporation, except where otherwise provided by law or these Bylaws, and such execution or signature shall be binding upon the Corporation.

All checks and drafts drawn on banks or other depositaries on funds to the credit of the Corporation or in special accounts of the Corporation shall be signed by such person or persons as the Board of Directors shall authorize so to do.

Unless authorized or ratified by the Board of Directors or within the agency power of an officer, no officer, agent or employee shall have any power or authority to bind the Corporation by any contract or engagement or to pledge its credit or to render it liable for any purpose or for any amount.

Section 34. Voting of Securities Owned By the Corporation. All stock and other securities of other Corporations owned or held by the Corporation for itself, or for other parties in any capacity, shall be voted, and all proxies with respect thereto shall be executed, by the person authorized so to do by resolution of the Board of Directors, or, in the absence of such authorization, by the Chairperson of the Board of Directors, the Chief Executive Officer, the President, or any Vice President.

ARTICLE VII

SHARES OF STOCK

Section 35. Form and Execution of Certificates. The shares of the Corporation shall be represented by certificates, or shall be uncertificated if so provided by resolution or resolutions of the Board of Directors. Certificates for the shares of stock, if any, shall be in such form as is consistent with the Amended and Restated Certificate of Incorporation and applicable law. Every holder of stock in the Corporation represented by certificate shall be entitled to have a certificate signed by or in the name of the Corporation by any two authorized officers of the Corporation, including but not limited to, the Chief Executive Officer, the President, the Chief Financial Officer, any Vice President, the Treasurer or Assistant Treasurer or the Secretary or Assistant Secretary, certifying the number of shares owned by him in the Corporation. Any or all of the signatures on the certificate may be facsimiles. In case any officer, transfer agent, or registrar who has signed or whose facsimile signature has been placed upon a certificate shall have ceased to be such officer, transfer agent, or registrar before such certificate is issued, it may be issued with the same effect as if he or she were such officer, transfer agent, or registrar at the date of issue.

Section 36. Lost Certificates. A new certificate or certificates shall be issued in place of any certificate or certificates theretofore issued by the Corporation alleged to have been lost, stolen, or destroyed, upon the making of an affidavit of that fact by the person claiming the certificate of stock to be lost, stolen, or destroyed. The Corporation may require, as a condition precedent to the issuance of a new certificate or certificates, the owner of such lost, stolen, or destroyed certificate or certificates, or the owner's legal representative, to agree to indemnify the Corporation in such manner as it shall require or to give the Corporation a surety bond in such form and amount as it may direct as indemnity against any claim that may be made against the Corporation with respect to the certificate alleged to have been lost, stolen, or destroyed.

Section 37. Transfers.

(a) Transfers of record of shares of stock of the Corporation shall be made only upon its books by the holders thereof, in person or by attorney duly authorized, and, in the case of stock represented by certificate, upon the surrender of a properly endorsed certificate or certificates for a like number of shares.

(b) The Corporation shall have power to enter into and perform any agreement with any number of stockholders of any one or more classes of stock of the Corporation to restrict the transfer of shares of stock of the Corporation of any one or more classes owned by such stockholders in any manner not prohibited by the DGCL.

Section 38. Fixing Record Dates.

(a) In order that the Corporation may determine the stockholders entitled to notice of or to vote at any meeting of stockholders or any adjournment thereof, the Board of Directors may fix a record date, which record date shall not precede the date upon which the resolution fixing the record date is adopted by the Board of Directors, and which record date shall, subject to applicable law, not be more than sixty (60) nor less than ten (10) days before the date of such meeting. If no record date is fixed by the Board of Directors, the record date for determining stockholders entitled to notice of or to vote at a meeting of stockholders shall be at the close of business on the day next preceding the day on which notice is given, or if notice is waived, at the close of business on the day next preceding the day on which the meeting is held. A determination of stockholders of record entitled to notice of or to vote at a meeting of stockholders shall apply to any adjournment of the meeting; *provided, however,* that the Board of Directors may fix a new record date for the adjourned meeting.

(b) In order that the Corporation may determine the stockholders entitled to receive payment of any dividend or other distribution or allotment of any rights or the stockholders entitled to exercise any rights in respect of any change, conversion or exchange of stock, or for the purpose of any other lawful action, the Board of Directors may fix, in advance, a record date, which record date shall not precede the date upon which the resolution fixing the record date is adopted, and which record date shall be not more than sixty (60) days prior to such action. If no record date is fixed, the record date for determining stockholders for any such purpose shall be at the close of business on the day on which the Board of Directors adopts the resolution relating thereto.

Section 39. Registered Stockholders. The Corporation shall be entitled to recognize the exclusive right of a person registered on its books as the owner of shares to receive dividends, and to vote as such owner, and shall not be bound to recognize any equitable or other claim to or interest in such share or shares on the part of any other person whether or not it shall have express or other notice thereof, except as otherwise provided by the laws of Delaware.

ARTICLE VIII

OTHER SECURITIES OF THE CORPORATION

Section 40. Execution of Other Securities. All bonds, debentures and other corporate securities of the Corporation, other than stock certificates (covered in Section 35), may be signed by the Chief Executive Officer, the President or any Vice President, or such other person as may be authorized by the Board of Directors, and if such securities require it, the corporate seal may be impressed thereon or a facsimile of such seal may be imprinted thereon and attested by the signature of the Secretary of the Corporation or an Assistant Secretary of the Corporation, or the Chief Financial Officer or Treasurer or an Assistant Treasurer; *provided, however,* that where any such bond, debenture or other corporate security shall be authenticated by the manual signature, or where permissible facsimile signature, of a trustee under an indenture pursuant to which such bond, debenture or other corporate security shall be issued, the signatures of the persons signing and attesting the corporate seal on such bond, debenture or other corporate security may be the imprinted facsimile of the signatures of such persons. Interest coupons appertaining to any such bond, debenture or other corporate security, authenticated by a trustee as aforesaid, shall be signed by the Treasurer or an Assistant Treasurer of the Corporation or such other person as may be authorized by the Board of Directors, or bear imprinted thereon the facsimile signature of such person. In case any officer who shall have signed or attested any bond, debenture or other corporate security, or whose facsimile signature shall appear thereon or on any such interest coupon, shall have ceased to be such officer before the bond, debenture or other corporate security so signed or attested shall have been delivered, such bond, debenture or other corporate security nevertheless may be adopted by the Corporation and issued and delivered as though the person who signed the same or whose facsimile signature shall have been used thereon had not ceased to be such officer of the Corporation.

ARTICLE IX

DIVIDENDS

Section 41. Declaration of Dividends. Dividends upon the capital stock of the Corporation, subject to the provisions of the Amended and Restated Certificate of Incorporation and applicable law, if any, may be declared by the Board of Directors pursuant to law at any regular or special meeting. Dividends may be paid in cash, in property, or in shares of the capital stock, subject to the provisions of the Amended and Restated Certificate of Incorporation and applicable law.

Section 42. Dividend Reserve. Before payment of any dividend, there may be set aside out of any funds of the Corporation available for dividends such sum or sums as the Board of Directors from time to time, in their absolute discretion, think proper as a reserve or reserves to meet contingencies, or for equalizing dividends, or for repairing or maintaining any property of the Corporation, or for such other purpose as the Board of Directors shall think conducive to the interests of the Corporation, and the Board of Directors may modify or abolish any such reserve in the manner in which it was created.

ARTICLE X

FISCAL YEAR

Section 43. Fiscal Year. The fiscal year of the Corporation shall be fixed by resolution of the Board of Directors.

ARTICLE XI

INDEMNIFICATION

Section 44. Indemnification of Directors, Executive Officers, Other Officers, Employees and Other Agents.

(a) Directors and Executive Officers. The Corporation shall indemnify its directors and executive officers (for the purposes of this Article XI, "***executive officers***" shall have the meaning defined in Rule 3b-7 promulgated under the 1934 Act) to the extent not prohibited by the DGCL or any other applicable law; *provided, however,* that the Corporation may modify the extent of such indemnification by individual contracts with its directors and executive officers; and, *provided, further,* that the Corporation shall not be required to indemnify any director or executive officer in connection with any proceeding (or part thereof) initiated by such person unless (i) such indemnification is expressly required to be made by law, (ii) the proceeding was authorized by the Board of Directors of the Corporation, (iii) such indemnification is provided by the Corporation, in its sole discretion, pursuant to the powers vested in the Corporation under the DGCL or any other applicable law or (iv) such indemnification is required to be made under subsection (d).

(b) Other Officers, Employees and Other Agents. The Corporation shall have power to indemnify (including the power to advance expenses in a manner consistent with subsection (c) of this Bylaw) its other officers, employees and other agents as set forth in the DGCL or any other applicable law. The Board of Directors shall have the power to delegate the determination of whether indemnification shall be given to any such person except executive officers to such officers or other persons as the Board of Directors shall determine.

(c) Expenses. The Corporation shall advance to any person who was or is a party or is threatened to be made a party to any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative or investigative, by reason of the fact that such person is or was a director or executive officer, of the Corporation, or is or was serving at the request of the Corporation as a director or executive officer of another Corporation, partnership, joint venture, trust or other enterprise, prior to the final disposition of the proceeding, promptly following request therefor, all expenses incurred by any director or executive officer in connection with such proceeding provided, however, that if the DGCL requires, an advancement of expenses incurred by a director or executive officer in his or her capacity as a director or executive officer (and not in any other capacity in which service was or is rendered by such indemnitee, including, without limitation, service to an employee benefit plan)

shall be made only upon delivery to the Corporation of an undertaking (hereinafter an "***undertaking***"), by or on behalf of such indemnitee, to repay all amounts so advanced if it shall ultimately be determined by final judicial decision from which there is no further right to appeal (hereinafter a "***final adjudication***") that such indemnitee is not entitled to be indemnified for such expenses under this section or otherwise.

Notwithstanding the foregoing, unless otherwise determined pursuant to paragraph (e) of this section, no advance shall be made by the Corporation to an executive officer of the Corporation (except by reason of the fact that such executive officer is or was a director of the Corporation in which event this paragraph shall not apply) in any action, suit or proceeding, whether civil, criminal, administrative or investigative, if a determination is reasonably and promptly made (i) by a majority vote of directors who were not parties to the proceeding, even if not a quorum, or (ii) by a committee of such directors designated by a majority vote of such directors, even though less than a quorum, or (iii) if there are no such directors, or such directors so direct, by independent legal counsel in a written opinion, that the facts known to the decision-making party at the time such determination is made demonstrate clearly and convincingly that such person acted in bad faith or in a manner that such person did not reasonably believe to be in or not opposed to the best interests of the Corporation.

(d) Enforcement. Without the necessity of entering into an express contract, all rights to indemnification and advances to directors and executive officers under this Bylaw shall be deemed to be contractual rights and be effective to the same extent and as if provided for in a contract between the Corporation and the director or executive officer. Any right to indemnification or advances granted by this section to a director or executive officer shall be enforceable by or on behalf of the person holding such right in any court of competent jurisdiction if (i) the claim for indemnification or advances is denied, in whole or in part, or (ii) no disposition of such claim is made within ninety (90) days of request therefor. To the extent permitted by law, the claimant in such enforcement action, if successful in whole or in part, shall be entitled to be paid also the expense of prosecuting the claim. In connection with any claim for indemnification, the Corporation shall be entitled to raise as a defense to any such action that the claimant has not met the standards of conduct that make it permissible under the DGCL or any other applicable law for the Corporation to indemnify the claimant for the amount claimed. In connection with any claim by an executive officer of the Corporation (except in any action, suit or proceeding, whether civil, criminal, administrative or investigative, by reason of the fact that such executive officer is or was a director of the Corporation) for advances, the Corporation shall be entitled to raise a defense as to any such action clear and convincing evidence that such person acted in bad faith or in a manner that such person did not believe to be in or not opposed to the best interests of the Corporation, or with respect to any criminal action or proceeding that such person acted without reasonable cause to believe that his or her conduct was lawful. Neither the failure of the Corporation (including its Board of Directors, independent legal counsel or its stockholders) to have made a determination prior to the commencement of such action that indemnification of the claimant is proper in the circumstances because he or she has met the applicable standard of conduct set forth in the DGCL or any other applicable law, nor an actual determination by the Corporation (including its Board of Directors, independent legal counsel or its stockholders) that the claimant has not met such applicable standard of conduct, shall be a defense to the action or create a presumption that claimant has not met the applicable standard of conduct. In any suit brought by a director or executive officer to enforce a right to indemnification or to an advancement of expenses hereunder, the burden of proving that the director or executive officer is not entitled to be indemnified, or to such advancement of expenses, under this section or otherwise shall be on the Corporation.

(e) Non-Exclusivity of Rights. The rights conferred on any person by this Bylaw shall not be exclusive of any other right which such person may have or hereafter acquire under any applicable statute, provision of the Amended and Restated Certificate of Incorporation, Bylaws, agreement, vote of stockholders or disinterested directors or otherwise, both as to action in his or her official capacity and as to action in another capacity while holding office. The Corporation is specifically authorized to enter into individual contracts with any or all of its directors, officers, employees or agents respecting indemnification and advances, to the fullest extent not prohibited by the DGCL, or by any other applicable law.

(f) Survival of Rights. The rights conferred on any person by this Bylaw shall continue as to a person who has ceased to be a director or executive officer, or other officer, employee or other agent and shall inure to the benefit of the heirs, executors and administrators of such a person.

(g) Insurance. To the fullest extent permitted by the DGCL or any other applicable law, the Corporation, upon approval by the Board of Directors, may purchase insurance on behalf of any person required or permitted to be indemnified pursuant to this section.

(h) Amendments. Any repeal or modification of this section shall only be prospective and shall not affect the rights under this Bylaw in effect at the time of the alleged occurrence of any action or omission to act that is the cause of any proceeding against any agent of the Corporation.

(i) Saving Clause. If this Bylaw or any portion hereof shall be invalidated on any ground by any court of competent jurisdiction, then the Corporation shall nevertheless indemnify each director and executive officer to the full extent not prohibited by any applicable portion of this section that shall not have been invalidated, or by any other applicable law. If this section shall be invalid due to the application of the indemnification provisions of another jurisdiction, then the Corporation shall indemnify each director and executive officer to the full extent under any other applicable law.

(j) Certain Definitions. For the purposes of this Bylaw, the following definitions shall apply:

(i) The term "***proceeding***" shall be broadly construed and shall include, without limitation, the investigation, preparation, prosecution, defense, settlement, arbitration and appeal of, and the giving of testimony in, any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative or investigative.

(ii) The term "***expenses***" shall be broadly construed and shall include, without limitation, court costs, attorneys' fees, witness fees, fines, amounts paid in settlement or judgment and any other costs and expenses of any nature or kind incurred in connection with any proceeding.

(iii) The term the "***Corporation***" shall include, in addition to the resulting corporation, any constituent corporation (including any constituent of a constituent) absorbed in a consolidation or merger which, if its separate existence had continued, would have had power and authority to indemnify its directors, officers, and employees or agents, so that any person who is or was a director, officer, employee or agent of such constituent corporation, or is or was serving at the request of such constituent corporation as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise, shall stand in the same position under the provisions of this section with respect to the resulting or surviving corporation as he or she would have with respect to such constituent corporation if its separate existence had continued.

(iv) References to a "***director***," "***executive officer***," "***officer***," "***employee***," or "***agent***" of the Corporation shall include, without limitation, situations where such person is serving at the request of the Corporation as, respectively, a director, executive officer, officer, employee, trustee or agent of another Corporation, partnership, joint venture, trust or other enterprise.

(v) References to "***other enterprises***" shall include employee benefit plans; references to "***fines***" shall include any excise taxes assessed on a person with respect to an employee benefit plan; and references to "***serving at the request of the Corporation***" shall include any service as a director, officer, employee or agent of the Corporation which imposes duties on, or involves services by, such director, officer, employee, or agent with respect to an employee benefit plan, its participants, or beneficiaries; and a person who acted in good faith and in a manner such person reasonably believed to be in the interest of the participants and beneficiaries of an employee benefit plan shall be deemed to have acted in a manner "***not opposed to the best interests of the Corporation***" as referred to in this section.

ARTICLE XII

NOTICES

Section 45. Notices.

(a) Notice to Stockholders. Written notice to stockholders of stockholder meetings shall be given as provided in Section 7 herein. Without limiting the manner by which notice may otherwise be given effectively to stockholders under any agreement or contract with such stockholder, and except as otherwise required by law, written notice to stockholders for purposes other than stockholder meetings may be sent by U.S. mail or nationally recognized overnight courier, or by facsimile, telegraph or telex or by electronic mail or other electronic means.

(b) Notice to Directors. Any notice required to be given to any director may be given by the method stated in subsection (a), or as otherwise provided in these Bylaws, with notice other than one which is delivered personally to be sent to such address as such director shall have filed in writing with the Secretary of the Corporation, or, in the absence of such filing, to the last known address of such director.

(c) Affidavit of Mailing. An affidavit of mailing, executed by a duly authorized and competent employee of the Corporation or its transfer agent appointed with respect to the class of stock affected, or other agent, specifying the name and address or the names and addresses of the stockholder or stockholders, or director or directors, to whom any such notice or notices was or were given, and the time and method of giving the same, shall in the absence of fraud, be prima facie evidence of the facts therein contained.

(d) Methods of Notice. It shall not be necessary that the same method of giving notice be employed in respect of all recipients of notice, but one permissible method may be employed in respect of any one or more, and any other permissible method or methods may be employed in respect of any other or others.

(e) Notice to Person With Whom Communication is Unlawful. Whenever notice is required to be given, under any provision of law or of the Amended and Restated Certificate of Incorporation or Bylaws of the Corporation, to any person with whom communication is unlawful, the giving of such notice to such person shall not be required and there shall be no duty to apply to any governmental authority or agency for a license or permit to give such notice to such person. Any action or meeting which shall be taken or held without notice to any such person with whom communication is unlawful shall have the same force and effect as if such notice had been duly given. In the event that the action taken by the Corporation is such as to require the filing of a certificate under any provision of the DGCL, the certificate shall state, if such is the fact and if notice is required, that notice was given to all persons entitled to receive notice except such persons with whom communication is unlawful.

(f) Notice to Stockholders Sharing an Address. Except as otherwise prohibited under DGCL, any notice given under the provisions of DGCL, the Amended and Restated Certificate of Incorporation or these Bylaws shall be effective if given by a single written notice to stockholders who share an address if consented to by the stockholders at that address to whom such notice is given. Such consent shall have been deemed to have been given if such stockholder fails to object in writing to the Corporation within sixty (60) days of having been given notice by the Corporation of its intention to send the single notice. Any consent shall be revocable by the stockholder by written notice to the Corporation.

ARTICLE XIII

AMENDMENTS

Section 46. Amendments. Subject to the limitations set forth in Section 44(h) of these Bylaws or the provisions of the Amended and Restated Certificate of Incorporation, the Board of Directors is expressly empowered to adopt, amend or repeal these Bylaws of the Corporation. Any adoption, amendment or repeal of these Bylaws of the Corporation by the Board of Directors shall require the approval of a majority of the authorized number of directors. The stockholders also shall have power to adopt, amend or repeal these Bylaws of the Corporation; *provided, however,* that, in addition to any vote of the holders of any class or series of stock of the

Corporation required by law or by the Amended and Restated Certificate of Incorporation, such action by stockholders shall require the affirmative vote of the holders of at least sixty-six and two-thirds percent (66-2/3%) of the voting power of all of the then-outstanding shares of the capital stock of the Corporation entitled to vote generally in the election of directors, voting together as a single class.

ARTICLE XIV

LOANS TO OFFICERS

Section 47. Loans to Officers. Except as otherwise prohibited by applicable law, the Corporation may lend money to, or guarantee any obligation of, or otherwise assist any officer or

other employee of the Corporation or of its subsidiaries, including any officer or employee who is a director of the Corporation or its subsidiaries, whenever, in the judgment of the Board of Directors, such loan, guarantee or assistance may reasonably be expected to benefit the Corporation. The loan, guarantee or other assistance may be with or without interest and may be unsecured, or secured in such manner as the Board of Directors shall approve, including, without limitation, a pledge of shares of stock of the Corporation. Nothing in these Bylaws shall be deemed to deny, limit or restrict the powers of guaranty or warranty of the Corporation at common law or under any statute.

EXHIBIT 10.1

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.

ASSIGNMENT AND ASSUMPTION OF LEASE

This ASSIGNMENT AND ASSUMPTION OF LEASE (this "**Assignment**") is executed as of September 1, 2023 by and between **CODEXIS, INC**, a Delaware corporation ("**Assignor**") and **VAXCYTE, INC.**, a Delaware corporation ("**Assignee**").

RECITALS

The parties enter into this Assignment on the basis of the following facts, understandings, and intentions:

A. Assignor and ARE San Francisco No. 63, LLC, a Delaware limited liability company ("**Landlord**"), are parties to that certain Lease Agreement dated as of January 29, 2021 (the "**Lease**", a copy of which is attached as Exhibit A) covering certain premises located at 825 Industrial Road, San Carlos, California (the "**Building**") containing approximately 36,593 rentable square feet consisting of (i) Suite 100A located on the ground floor of the Building, containing approximately 18,817 rentable square feet and (ii) Suite 200B located on the second floor of the Building, containing approximately 17,776 rentable square feet (the "**Premises**").

B. Subject to the terms of this Assignment, Assignor desires to assign to Assignee all of Assignor's right, title, and interest as "Tenant" under the Lease from and after the Effective Date, and Assignee desires to assume all of Assignor's obligations as "Tenant" under the Lease from and after the Effective Date.

NOW THEREFORE, in consideration of the foregoing Recitals and the mutual covenants and conditions contained herein, the parties hereby agree as follows:

1. Assignment: Assignor hereby assigns, transfers and conveys to Assignee, and Assignee hereby accepts, as of the Effective Date, all of Assignor's right, title and interest in, under and to the Lease and the Premises. Also effective as of the Effective Date, Assignee accepts this assignment and assumes and agrees to keep, perform and fulfill, as a direct obligation to Landlord and for the benefit of Assignor, all of the terms, covenants, conditions and obligations required to be kept, performed and fulfilled by the "Tenant" under the Lease from and after the Effective Date, including, without limitation, the making of all payments due to, or payable on behalf of, Landlord under the Lease which may become due and payable on or after the Effective Date, but excluding the Base Rent Abatement (as defined in Section 6 below) and the Remaining TI Rent (as defined in Section 7 below). Subject to the last sentence of Section 4 below, Assignee shall not be responsible for claims by Landlord for indemnification under the indemnity clauses under the Lease with respect to occurrences taking place prior to the Effective Date.

2. Reconciliations and Prepaid Rents: To the extent there is any reconciliation of Operating Expenses with respect to any period prior to the Effective Date, Assignor and Assignee agree to equitably make adjustments as of the Effective Date, and Assignee shall provide the requisite back-up documentation for all such Operating Expenses for the parties to make the equitable adjustments. Assignee and Assignor, as the case may be, each agrees to make payment of any amounts owed within thirty (30) days following such reconciliation. In addition, if the Effective Date is a date other than the

first day of the month, any Rent paid by Assignor under the Lease allocable to the portion of such month from and after the Effective Date shall be applied towards Assignor's obligation under this Assignment to pay the Base Rent Abatement.

3. Effective Date and Delivery. The "Effective Date" shall be the earlier of (a) the date by which Assignee occupies the Premises for the operation of business (provided that the exercise of Assignee's early access rights pursuant to Section 4 below shall not be deemed the commencement of operation of business at the Premises by Assignee) or (b) the date by which (i) Assignor delivers the Premises to Assignee broom clean and Fully Decommissioned (as hereinafter defined) with respect to Assignor's lab operations, (ii) the Consent (as hereinafter defined) has been obtained, (iii) the outstanding principal balance of the Remaining TI Rent has been paid pursuant to Section 7 below, and (iv) the Agilent Bravo96 has been removed pursuant to Section 13 below. "**Fully Decommissioned**" shall mean (x) the decommissioning of the Premises with respect to Assignor's lab operations as required by the local jurisdiction as evidenced by either (A) a closure or sign-off letter with respect thereto (or equivalent documentation evidencing that the local jurisdiction is satisfied with its decommissioning inspection, with no reservations, additional work or any follow-up required) or (B) an email from the local jurisdiction stating that Assignor passed its decommissioning inspection, with no reservations, additional work or any follow-up required (in the event this decommissioning requirement is satisfied through such an email, Assignor shall promptly provide to Assignee a copy of the formal letter if and when received), and (y)Assignor's completion of the Decommissioning and HazMat Closure Plan approved by Landlord. Assignor shall promptly forward to Assignee a copy of the closure letter that it receives from the local jurisdiction regarding the decommissioning of the Premises. The target Effective Date shall be October 1, 2023. This Assignment shall not be void or voidable, nor shall Assignor be liable to Assignee for any loss or damage, by reason of delays in the Effective Date or delays in Assignor delivering the Premises to Assignee for any reason whatsoever; provided, however, (a) in the event the Effective Date shall not have occurred on or before December 1, 2023 (the "**Penalty Delivery Deadline Date**"), then the Base Rent Abatement shall be increased by one (1) day for each day of delay in the Effective Date beyond the Penalty Delivery Deadline Date, and (b) in the event the Effective Date shall not have occurred on or before January 1, 2024 (the "**Termination Delivery Deadline Date**", and collectively with the Penalty Delivery Deadline Date, the "**Deadline Delivery Dates**"), then Assignee shall have the right to terminate the Assignment, without any penalties or liability to Assignor, by written notice to Assignor prior to the occurrence of the Effective Date, in which event neither Assignor nor Assignee shall have any further obligation to each other under this Agreement, except for the obligations of Assignee in the last sentence of Section 4, and except that Assignee shall promptly remove any items that may have been installed by Assignee pursuant to Section 4 below and repair any damaged caused by such removal and shall be afforded a reasonable opportunity to do so; provided, however, Assignee shall exercise its termination right hereunder no later than ten (10) days following Assignee's receipt of written notice from Assignor (if given, at Assignor's option) in which Assignor acknowledges that the Termination Delivery Deadline Date has passed and the Effective Date has not occurred and that Assignee has the right under this Paragraph to terminate this Lease. The foregoing Delivery Deadline Dates shall be extended to the extent of any delays in the Effective Date caused by Force Majeure (as defined in Section 34 of the Lease), provided that governmental and inspection related delays shall not be considered events of Force Majeure for such purposes. Within ten (10) days of request by either Assignor or Assignee following the Effective Date, Assignor and Assignee shall acknowledge the actual Effective Date by executing an Assignment Effective Date Memorandum in the form attached hereto as Exhibit B. For the avoidance of doubt, the Premises shall be deemed delivered when the Consent has been obtained and Assignor has vacated the Premises, has Fully Decommissioned the same with respect to Assignor's lab operations and provides Assignee keys or other means of access thereto.

4. Early Access. Assignor shall provide Assignee access to the portion of the Premises on the first floor (i.e., the office portions) thirty (30) days prior to the Effective Date free of any monetary

obligation, for the purpose of allowing Assignee to install furniture, fixtures and equipment and IT infrastructure; provided that prior to such access, Assignee has delivered to Assignor evidence of all insurance required of "Tenant" under the Lease. With respect to such period of early access, Assignee shall include Assignor as an additional insured under its liability insurance policy. Except to the extent resulting from the negligence or willful misconduct of Assignor or its employees, contractors or agents, Assignee shall indemnify, protect, defend and hold Assignor harmless from and against all liability, penalties, losses, damages, costs, expenses, causes of action, claims and judgments arising from or in connection with any such early access and preparation of the Premises for occupancy.

5. Condition of Premises. Assignee acknowledges and agrees that it has inspected the Premises and is familiar with its condition. Assignee accepts the Premises in their present "AS IS" and "WITH ALL FAULTS" condition, subject to the terms of this Paragraph. Notwithstanding the foregoing, Assignor shall deliver the Premises to Assignee broom clean and Fully Decommissioned with respect to Assignor's lab operations and with the Agilent Bravo96 removed. Assignee acknowledges and agrees that neither Assignor nor any of its respective agents or employees has made any warranties or representations concerning the Premises, including about the condition of the Premises and the suitability of its use by Assignee. Assignee further acknowledges and agrees that Assignor has no obligation to perform any work, supply any materials, incur any expense, make any alterations or improvements to the Premises or to provide Assignee with any construction or fit-out allowance.

6. Base Rent Reimbursement. The "**Base Rent Abatement**" shall mean the Base Rent under the Lease with respect to the three (3)-month period (the "**Base Rent Abatement Period**") commencing on the Effective Date and ending on the day immediately preceding the date which is three (3) months after the Effective Date. For clarity, if the Effective Date occurs on October 5, 2023, the Base Rent Abatement shall consist of the Base Rent under the Lease with respect to the period commencing on October 5, 2023 and ending on January 4, 2024. Assignor shall be responsible for payment of the Base Rent Abatement in accordance with the Lease. Assignor shall prepay to Landlord the Base Rent Abatement on or before the Effective Date. In addition, in the event the Base Rent Abatement is increased pursuant to Section 3 above, Assignor shall pay such increased Base Rent Abatement directly to Landlord. Unless waived by Assignor and Assignee by their execution and delivery of the Consent, it is a condition to the effectiveness of this Assignment that Landlord consent in the Consent to the prepayment of the Base Rent Abatement by Assignor.

7. Remaining TI Rent. The "**Remaining TI Rent**" shall mean the TI Rent payable under Section 4(b) of the Lease incurred by Assignor in connection with the Additional Tenant Improvement Allowance previously funded by Landlord to Assignor. Payment of the Remaining TI Rent shall remain Assignor's responsibility in accordance with Section 4(b) of the Lease. On or before the Effective Date and as a condition to the occurrence thereof, Assignor shall prepay the outstanding principal balance of the Remaining TI Rent as required to satisfy the obligation of "Tenant" under the Lease in connection therewith.

8. Indemnity. Assignor shall indemnify, protect and defend Assignee against and hold Assignee harmless from any and all losses, costs, damages, liabilities and expenses, including, without limitation, reasonable attorneys' fees, incurred by Assignee as a result of any claim arising under the Lease with respect to an event or alleged default, negligence or willful misconduct of Assignor or its employees, agents, guests or invitees occurring on or before the Effective Date. Assignee shall indemnify, protect and defend Assignor against and hold Assignor harmless from any and all losses, costs, damages, liabilities and expenses, including, without limitation, reasonable attorneys' fees, incurred by Assignor as a result of any claim arising under the Lease with respect to an event or alleged default, negligence or willful misconduct of Assignee or its employees, agents, guests or invitees occurring after the Effective Date.

9. No Options; No Modifications: Assignee agrees that it shall not: (a) exercise the Expansion Right under Section 39 of the Lease, the Extension Right under Section 40 of the Lease, or any other options to extend or renew the Term of the Lease or to expand the Premises, all of which options and rights Assignee hereby waives; (b) extend the Term of the Lease or expand the Premises; or (c) otherwise amend or modify the Lease in any manner that would increase Assignor's liability thereunder; provided, however, Assignee may exercise the Extension Right pursuant to Section 40 of the Lease, so long as (i) Landlord consents to the assignment of such Extension Right pursuant to the Consent; and (ii) Landlord agrees that Assignor shall be released from all liability and obligations under the Lease during the Extension Term.

10. Furniture, Fixtures and Equipment. Assignor shall deliver with the Premises the furniture, fixtures and equipment identified on Exhibit C (the "**Conveyed FF&E**"), and shall, effective upon the Effective Date, quitclaim to Assignee without representation, warranty or recourse such Conveyed FF&E, and Assignee shall accept the Conveyed FF&E in its "AS IS" condition with all faults and defects and without warranty or representation. Assignee hereby disclaims any implied warranties of merchantability or fitness for any particular purpose with respect to the Conveyed FF&E. The transfer of ownership of the Conveyed FF&E shall occur automatically upon the Effective Date and this Assignment shall constitute a bill of sale evidencing the transfer of the same. All personal property of Assignor which is not part of the Conveyed FF&E shall be removed by Assignor prior to Assignor's delivery of the Premises. For avoidance of doubt, the two bookshelves identified by Assignee and currently existing in the Premises shall not be part of the Conveyed FF&E and Assignor shall remove the same prior to the Effective Date.

11. Security Deposit. On or before the Effective Date, Assignee shall deliver to Landlord the Security Deposit in the amount of Two Hundred Twenty Thousand, Six Hundred Fifty-Five and 79/100 Dollars ($220,655.79), in the form of a letter of credit. Assignor and Assignee agree that the Security Deposit and Letter of Credit deposited by Assignor under the Lease shall remain the property of Assignor, and Assignee shall have no interest therein. Unless waived by Assignor and Assignee by their execution and delivery of the Consent, it is a condition to the effectiveness of this Assignment that Landlord consent in the Consent to the reduction of the Security Deposit to such amount, as more particularly set forth in the Consent.

12. Existing Signage: Prior to delivery of the Premises, Assignor shall remove its existing signage at the Premises.

13. Equipment Sale. Assignor and Assignee are in discussions for the sale by Assignor and the purchase by Assignee of the equipment listed on Exhibit D (collectively, the "**Sale Equipment**"). Any such purchase and sale shall be made, if at all, pursuant to a separate agreement. Either party may terminate negotiations for such purchase and sale at any time for any reason or for no reason. If both parties in their sole discretion enter into such purchase and sale of the Sale Equipment, then Assignor shall leave the Sale Equipment in the Premises but shall otherwise remove any unpurchased Sale Equipment prior to delivery. For the avoidance of doubt, the Agilent Bravo96 shall not be included in the Sale Equipment, and Assignor shall remove the same prior to the Effective Date and as a condition to the occurrence thereof.

14. No Removal of Existing Improvements: Assignee shall not be responsible for removing or restoring any improvements present as of the Effective Date (except for wiring and cabling). Unless waived by Assignor and Assignee by their execution and delivery of the Consent, it is a condition to the effectiveness of this Assignment that Landlord confirm and agree in the Consent that neither Assignor nor Assignee shall be required to remove any improvements present as of the Effective Date.

15. Notices: Unless at least five (5) days' prior written notice is given in the manner set forth in this paragraph, the address of each party shall be that address set forth below their signatures at the end of this Assignment. All notices, demands or communications in connection with this Assignment shall be personally delivered or properly addressed and deposited in the mail (certified, return receipt requested, and postage prepaid) or via recognized overnight courier. Notices shall be deemed delivered (a) upon receipt, if personally delivered, (b) three (3) business days after mailing, if mailed as set forth above; or (c) one (1) business day after deposit with a recognized overnight courier as set forth above.

16. Landlord Consent. Notwithstanding anything to the contrary herein, this Assignment shall not be effective until Landlord has signed and delivered to Assignor and Assignee Landlord's written consent to this Assignment (the "**Consent**") pursuant to a consent in form and content mutually agreeable to Landlord, Assignor and Assignee, which form and content shall be deemed to be mutually agreeable upon Landlord's, Assignor's and Assignee's execution and delivery of the Consent. In the event, for any reason whatsoever, the Consent is not delivered by Landlord within thirty (30) days after the execution of this Assignment by Assignor and Assignee, Assignor and Assignee each shall have the right, in its sole and absolute discretion, until such time as Landlord delivers the Consent, to terminate this Assignment by providing written notice to the other, in which case this Assignment shall automatically terminate and neither party shall owe any obligation to the other party. For avoidance of doubt, unless waived by Assignor and Assignee by their execution and delivery of the Consent, the Consent shall not be deemed given unless Landlord agrees, amongst other terms and conditions that (i) Landlord consents to the reduction of the Security Deposit; (ii) Landlord consents to the assignment of the right to exercise the Extension Right; (iii) Landlord agrees that Assignor shall be released from all liability and obligations under the Lease during the Extension Term; (iv) Landlord confirms and agrees in the Consent that neither Assignor nor Assignee shall be required to remove any improvements present as of the Effective Date; and (v) Landlord consents to the prepayment of the outstanding principal balance of the Remaining TI Rent.

17. Inspection by a CASp in Accordance with Civil Code Section 1938: To Assignor's actual knowledge, the property being leased or rented pursuant to this Assignment has not undergone inspection by a Certified Access Specialist (CASp). In addition, the following notice is hereby provided pursuant to Section 1938(e) of the California Civil Code: "A Certified Access Specialist (CASp) can inspect the subject premises and determine whether the subject premises comply with all of the applicable construction-related accessibility standards under state law. Although state law does not require a CASp inspection of the subject premises, the commercial property owner or lessor may not prohibit the lessee or tenant from obtaining a CASp inspection of the subject premises for the occupancy or potential occupancy of the lessee or tenant, if requested by the lessee or tenant. The parties shall mutually agree on the arrangements for the time and manner of the CASp inspection, the payment of the fee for the CASp inspection, and the cost of making any repairs necessary to correct violations of construction-related accessibility standards within the premises." Assignor and Assignee agree that if Assignee requests a CASp inspection of the Premises, then Assignee (a) shall pay the fee for such inspection, and (b) shall pay the cost of making any repairs necessary to correct violations of construction-related accessibility standards within the Premises if and to the extent "Tenant" would be required to pay the same under the terms of the Lease (but in no event shall Assignor be responsible for paying the same).

18. Authority. Each party hereto represents and warrants that it has the full capacity, right, power and authority to execute, deliver and perform this Assignment, and all required actions, consents and approvals therefor have been duly taken and obtained. This Assignment shall be binding upon and inure to the benefit of the parties, their respective heirs, legal representatives, successors and assigns.

19. Brokers. Assignor shall be responsible for any and all broker commissions due and owing to Assignor's broker, Jones Lang LaSalle Brokerage, Inc., and to Assignee's broker, Jones Lang

LaSalle Brokerage, Inc. (collectively, the "**Brokers**"), pursuant to a separate agreement. Assignor and Assignee each hereby agrees to protect, defend, indemnify and hold the other harmless from all claims, demands, causes of action, liabilities, losses, costs and expenses (including, without limitation, costs of suit and attorneys' fees) arising from or in connection with claims for broker commissions due and owing from or related to this Assignment by any broker employed by or claiming to represent or to have been employed by the indemnifying party, other than the Brokers as described above.

20. Miscellaneous. Assignor and Assignee shall execute and deliver such additional documents and take such additional actions as either may reasonably request to carry out the purposes of this Assignment. This Assignment shall be binding upon and shall inure to the benefit of the parties hereto and their respective heirs, successors and assigns. If either party brings an action or legal proceeding with respect to this Assignment, the prevailing party shall be entitled to recover its reasonable attorneys' fees and costs. All captions contained in this Assignment are for convenience of reference only and shall not affect the construction of this Assignment. This Assignment may be executed in one or more counterparts (including electronic counterparts such as by email with a pdf or similar attachment, and such electronic counterpart shall be deemed to have the same force and effect as an executed original), each of which shall be an original, but all of which, taken together, shall constitute one and the same Assignment. If any one or more of the provisions of this Assignment shall be invalid, illegal or unenforceable in any respect, the validity, legality and enforceability of the remaining provisions contained herein shall not in any way be affected or impaired thereby. This Assignment shall be governed by the laws of California without reference to conflicts of laws principles. All capitalized terms not otherwise defined in this Assignment shall have the meanings ascribed to them in the Lease.

21. Assignor's Representations and Warranties. Assignor represents and warrants that (a) the Lease is in full force and effect, and there exists under the Lease no default beyond applicable notice and cure periods by either Assignor, or to Assignor's knowledge, Landlord, nor, to Assignor's knowledge, has there occurred any event which, with the giving of notice or passage of time or both, could constitute such a default, and (b) the copy of the Master Lease attached hereto as Exhibit A is a true, correct and complete copy of the Master Lease.

22. Hazardous Materials.

A. Assignor represents and warrants that to Assignor's knowledge, (i) Assignor and its Tenant Parties (as defined in the Lease but excluding Assignee or Assignee's agents, servants, employees, invitees and contractors) have not brought upon, kept, used, stored, handled, treated, generated in, or released or disposed from the Premises any Hazardous Materials in violation of any Environmental Requirements (as defined in the Lease) (an "**Environmental Violation**"); and (ii) all of Assignor's Tenant HazMat Operations (as defined in the Lease) were performed in compliance with applicable Environmental Requirements. Without limiting the generality of Section 8 of this Assignment above, Assignor indemnifies and shall defend and hold Assignee, its officers, directors, employees, agents and contractors harmless from any and all Environmental Claims (as defined in the Lease) which arise during or after the Term arising from an Environmental Violation by Assignor or any of its Tenant Parties (excluding Assignee or Assignee's agents, servants, employees, invitees and contractors). This indemnification of Assignee by Assignor includes, without limitation, costs incurred in connection with any investigation of site conditions or any cleanup, treatment, remedial, removal, or restoration work required by any federal, state or local Governmental Authority (as defined in the Lease) because of Hazardous Materials present in the air, soil or ground water above, on, or under the Premises released by Assignor or any of its Tenant Parties (excluding Assignee or Assignee's agents, servants, employees, invitees and contractors).

B. Without limiting the generality of Section 8 of this Assignment above, Assignee

indemnifies and shall defend and hold Assignor, its officers, directors, employees, agents and contractors harmless from any and all Environmental Claims which arise during or after the Term arising from an Environmental Violation by Assignee or any of its Tenant Parties. This indemnification of Assignor by Assignee includes, without limitation, costs incurred in connection with any investigation of site conditions or any cleanup, treatment, remedial, removal, or restoration work required by any federal, state or local Governmental Authority because of Hazardous Materials present in the air, soil or ground water above, on, or under the Premises released by Assignee or any of its Tenant Parties.

[Signature page follows]

IN WITNESS WHEREOF, the parties hereto have executed this Assignment on the date first above written.

ASSIGNOR:

CODEXIS, INC.,
a Delaware corporation

By: /s/ Kevin Norrett

Print Name: Kevin Norrett

Title: Chief Operating Officer

CODEXIS, INC.,
a Delaware corporation

By: /s/ Sri Ryali

Print Name: Sri Ryali

Title: CFO

Address:

400 Penobscot Drive
Redwood City, CA 94063
Attention: Chief Operating Officer

with a copy to:

400 Penobscot Drive
Redwood City, CA 94063
Attention: General Counsel

ASSIGNEE:

VAXCYTE, INC.,
a Delaware corporation

By: /s/ Grant Pickering

Print Name: Grant Pickering

Title: CEO

Address:

825 Industrial Road
Suite 300
San Carlos, CA 94070
Attention: Chief Executive Officer

with a copy to:

825 Industrial Road
Suite 300
San Carlos, CA 94070
Attention: General Counsel

EXHIBIT A

LEASE

[Attached]

LEASE AGREEMENT

THIS LEASE AGREEMENT (this "**Lease**") is made this 29th day of January, 2021, between **ARE-SAN FRANCISCO NO. 63, LLC**, a Delaware limited liability company ("**Landlord**"), and **CODEXIS, INC.**, a Delaware corporation ("**Tenant**").

Building: That certain 6-story building to be known as 825 Industrial Road, San Carlos, California.

Premises: That portion of the Building containing approximately 36,593 rentable square feet, consisting of (i) Suite 100A located on the ground floor of the Building, containing approximately 18,817 rentable square feet and (ii) Suite 200B located on the second floor of the Building, containing approximately 17,776 rentable square feet, as shown on **Exhibit A**.

Project: The real property on which the Building in which the Premises are located, together with all improvements thereon and appurtenances thereto as described on **Exhibit B**.

Base Rent: $5.68 per rentable square foot of the Premises per month, subject to adjustment pursuant to Section 4 hereof.

Rentable Area of Premises: 36,593 sq. ft.

Rentable Area of Building: 277,056 sq. ft.

Rentable Area of Project: 524,437 sq. ft.

Tenant's Share of Operating Expenses of Building: 13.21%

Building's Share of Project: 52.83% sq. ft.

Security Deposit: $415,696.48

Target Commencement Date: November 1, 2021, provided that in the event the permit package for the Tenant Improvements is not completed by January 15, 2021, the Target Commencement Date shall be extended one day for each day after January 15, 2021 until such permit package is completed.

Rent Adjustment Percentage: 3%

Base Term: Beginning on the Commencement Date and ending 120 months from the first day of the first full month after the Commencement Date (as defined in Section 2) hereof. For clarity, if the Commencement Date occurs on the first day of a month, the expiration of the Base Term shall be measured from that date. If the Commencement Date occurs on a day other than the first day of a month, the expiration of the Base Term shall be measured from the first day of the following month.

Permitted Use: Research and development laboratory, office and other related uses consistent with the character of the Project and otherwise in compliance with the provisions of Section 7 hereof.

Address for Rent Payment: Landlord's Notice Address:
P.O. Box 975383 26 North Euclid Avenue
Dallas, TX 75397-5383 Pasadena, CA 91101
Attention: Corporate Secretary

Tenant's Notice Address:
200 Penobscot Drive
Redwood City, California 94063
Attention: Legal Department

The following Exhibits and Addenda are attached hereto and incorporated herein by this reference:

[X] **EXHIBIT A** - PREMISES DESCRIPTION [X] **EXHIBIT B** - DESCRIPTION OF PROJECT
[X] **EXHIBIT C** - WORK LETTER [X] **EXHIBIT D** - COMMENCEMENT DATE
[X] **EXHIBIT E** - RULES AND REGULATIONS [X] **EXHIBIT F** - TENANT'S PERSONAL PROPERTY
[X] **EXHIBIT G** - ORDER

1.**Lease of Premises**. Upon and subject to all of the terms and conditions hereof, Landlord hereby leases the Premises to Tenant and Tenant hereby leases the Premises from Landlord. The portions of the Project which are for the non-exclusive use of tenants of the Project are collectively referred to herein as the "**Common Areas**." Landlord reserves the right to modify Common Areas, provided that such modifications do not materially adversely affect Tenant's access to or use of the Premises for the Permitted Use. From and after the Commencement Date through the expiration of the Term, Tenant shall have access to the Building and the Premises 24 hours a day, 7 days a week, 365 days per year, except in the case of emergencies, as the result of Legal Requirements, the performance by Landlord of any installation, maintenance or repairs, or any other temporary interruptions, and otherwise subject to the terms of this Lease.

2.**Delivery; Acceptance of Premises; Commencement Date**. Landlord shall use reasonable efforts to deliver the Premises to Tenant on or before the Target Commencement Date, with the Tenant Improvements in the Premises Substantially Completed ("**Delivery**" or "**Deliver**"). If Landlord fails to timely Deliver the Premises, Landlord shall not be liable to Tenant for any loss or damage resulting therefrom, and this Lease shall not be void or voidable except as provided herein. Notwithstanding anything to the contrary contained herein, if Landlord fails to Deliver the Premises to Tenant on or before the date that is 90 days after the Target Commencement Date (as such date may be extended for Force Majeure (as defined in Section 34) and Tenant Delays, the "**Abatement Date**"), then, commencing immediately following the Abatement Period (as defined below), Base Rent shall be abated 1 day for each day from and including the Abatement Date (as such date may be extended for Force Majeure and Tenant Delays) that Landlord fails to Deliver the Premises to Tenant. If Landlord does not Deliver the Premises within 150 days of the Target Commencement Date for any reason other than Force Majeure delays or Tenant Delays, this Lease may be terminated by Tenant by written notice to Landlord, and if so terminated by Tenant: (a) the Security Deposit, or any balance thereof (i.e., after deducting therefrom all amounts to which Landlord is entitled under the provisions of this Lease), shall be returned to Tenant, and (b) neither Landlord nor Tenant shall have any further rights, duties or obligations under this Lease, except with respect to provisions which expressly survive termination of this Lease. As used herein, the terms "**Tenant Improvements**," "**Tenant Delays**" and "**Substantially Completed**" shall have the meanings set forth for such terms in the Work Letter. If Tenant does not elect to void this Lease within 10 business days of the lapse of such 150 day period, such right to void this Lease shall be waived and this Lease shall remain in full force and effect.

Notwithstanding the foregoing, Landlord and Tenant agree that if any Governmental Authority having jurisdiction of the Project, as a result of the COVID-19 outbreak in the United States declares or

implements any order or mandate that restricts construction activities in San Mateo county (any such order or mandate, a "**Government Mandate**"), then, to the extent such Government Mandate precludes

construction of Landlord's Work, the Target Commencement Date shall be delayed 1 day for each day that such a Government Mandate remains in effect and continues to preclude such construction of Landlord's Work.

Landlord and Tenant further acknowledge and agree that (i) as of the date of this Lease, the City of San Carlos (the "**City**") is routinely taking longer to issue the permits and approvals (collectively, "**Permits**") required for the design and construction of Landlord's Work than the timeframes contemplated by Landlord in the development of the schedule for the completion of Landlord's Work as reflected in the Schedule attached to the Work Letter as Schedule 3 (the "**Standard Issuance Period**"), and (ii) to the extent the issuance of any Permits required for the design and/or construction of Landlord's Work is delayed beyond the Standard Issuance Period (except for delays due to Landlord's failure to timely provide the City with information requested from Landlord by the City (except to the extent that such delays arise due to Tenant's failure to provide Landlord information requested from Tenant by Landlord)), then the Target Commencement Date shall be delayed 1 day for each day following the expiration of the Standard Issuance Period that the City fails to issue any such Permits (through and including the date that such Permits are issued by the City).

The "**Commencement Date**" shall be the earlier of: (i) the date Landlord Delivers the Premises to Tenant with the Tenant Improvements Substantially Completed; or (ii) the date Landlord would have Delivered the Premises to Tenant with the Tenant Improvements Substantially Completed but for Tenant Delays. The "**Rent Commencement Date**" shall occur on the date that is 90 days after the Commencement Date. Base Rent shall be abated for the period commencing on the Commencement Date and ending on the day immediately preceding the Rent Commencement Date (the "**Abatement Period**"). Upon written request of Landlord, Tenant shall execute and deliver a written acknowledgment of the Commencement Date, the Rent Commencement Date and the expiration date of the Term when such are established in the form of the "Acknowledgement of Commencement Date" attached to this Lease as **Exhibit D**; provided, however, failure to execute and deliver such acknowledgment shall not affect either party's rights hereunder. The "**Term**" of this Lease shall be the Base Term, as defined above on the first page of this Lease and the Extension Term which Tenant may elect pursuant to Section 40.

Except as set forth in the Work Letter or as otherwise expressly set forth in this Lease: (i) Tenant shall accept the Premises in their condition as of the Commencement Date; (ii) Landlord shall have no obligation for any defects in the Premises; and (iii) Tenant's taking possession of the Premises shall be conclusive evidence that Tenant accepts the Premises. Any occupancy of the Premises by Tenant before the Commencement Date shall be subject to all of the terms and conditions of this Lease, excluding the obligation to pay Base Rent and Operating Expenses. Notwithstanding anything to the contrary contained herein, nothing in this paragraph shall limit Landlord's obligations with respect to the performance of Landlord's Work (as defined in the Work Letter), Landlord's obligations under the second paragraph of Section 7 of this Lease, or Landlord's maintenance and repair obligations under Section 13 of this Lease.

For the period of 365 consecutive days after the Commencement Date, Landlord shall, at its sole cost and expense (which shall not constitute an Operating Expense), be responsible for any repairs that are required to be made to the Building Systems (as defined in Section 13) serving the Premises, unless Tenant or any Tenant Party was responsible for the cause of such repair, in which case Tenant shall pay

the cost. Tenant shall have the benefit of any warranties issued to Landlord in connection with Landlord's Work.

Tenant agrees and acknowledges that, except as otherwise expressly provided in this Lease, neither Landlord nor any agent of Landlord has made any representation or warranty with respect to the condition of all or any portion of the Premises or the Project, and/or the suitability of the Premises or the Project for the conduct of Tenant's business, and Tenant waives any implied warranty that the Premises or the Project are suitable for the Permitted Use. This Lease constitutes the complete agreement of Landlord and Tenant with respect to the subject matter hereof and supersedes any and all prior representations, inducements, promises, agreements, understandings and negotiations which are not

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contained herein. Landlord in executing this Lease does so in reliance upon Tenant's representations, warranties, acknowledgments and agreements contained herein.

3.**Rent**.

(a)**Base Rent**. Base Rent for the month in which the Rent Commencement Date occurs and the Security Deposit shall be due and payable on delivery of an executed copy of this Lease to Landlord. Tenant shall pay to Landlord in advance, without demand, abatement, deduction or set-off (except for any abatement, reduction or set-off as may be expressly provided in this Lease), monthly installments of Base Rent on or before the first day of each calendar month during the Term hereof after the Rent Commencement Date, in lawful money of the United States of America, at the office of Landlord for payment of Rent set forth above, or to such other person or at such other place as Landlord may from time to time designate in writing. Payments of Base Rent for any fractional calendar month shall be prorated. The obligation of Tenant to pay Base Rent and other sums to Landlord and the obligations of Landlord under this Lease are independent obligations. Tenant shall have no right at any time to abate, reduce, or set-off any Rent (as defined in Section 5) due hereunder except for any abatement, reduction or set-off as may be expressly provided in this Lease.

(b)**Additional Rent**. In addition to Base Rent, Tenant agrees to pay to Landlord as additional rent ("**Additional Rent**"): (i) commencing on the Commencement Date, Tenant's Share of "Operating Expenses" (as defined in Section 5), and (ii) any and all other amounts Tenant assumes or agrees to pay under the provisions of this Lease, including, without limitation, any and all other sums that may become due by reason of any default of Tenant or failure to comply with the agreements, terms, covenants and conditions of this Lease to be performed by Tenant, after any applicable notice and cure period.

4.**Base Rent Adjustments**.

(a)**Annual Adjustments**. Base Rent shall be increased on each annual anniversary of the Commencement Date (or, if the Commencement Date occurs on a date other than the first day of a calendar month, then on each annual anniversary of the first day of the full calendar month immediately following the Commencement Date) (each an "**Adjustment Date**") by multiplying the Base Rent payable immediately before such Adjustment Date by the Rent Adjustment Percentage and adding the resulting amount to the Base Rent payable immediately before such Adjustment Date. Base Rent, as so adjusted, shall thereafter be due as provided herein. Base Rent adjustments for any fractional calendar month shall be prorated.

(b)**Additional TI Allowance**. In addition to the Tenant Improvement Allowance (as defined in the Work Letter), Landlord shall, subject to the terms of the Work Letter, make available to Tenant the Additional Tenant Improvement Allowance (as defined in the Work Letter). Commencing on the Rent Commencement Date and continuing thereafter on the first day of each month during the Base Term, Tenant shall pay the amount necessary to fully amortize the portion of the Additional Tenant Improvement Allowance actually funded by Landlord, if any, in equal monthly payments with interest at a rate of 8% per annum over the Base Term, which interest shall begin to accrue on the date that Landlord first disburses such Additional Tenant Improvement Allowance or any portion(s) thereof ("**TI Rent**"). TI Rent shall not be subject to increases applicable to Base Rent. Any TI Rent (including applicable interest) remaining unpaid as of the expiration or earlier termination of this Lease shall be paid to Landlord in a lump sum at the expiration or earlier termination of this Lease.

5.**Operating Expense Payments**. Following the Commencement Date, Landlord shall, prior to the beginning of each calendar year, deliver to Tenant a written estimate of Operating Expenses for each calendar year during the Term (the "**Annual Estimate**"), which may be revised by Landlord from time to time during such calendar year. Commencing on the Commencement Date and continuing thereafter on the first day of each month during the Term, Tenant shall pay Landlord an amount equal to

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1/12th of Tenant's Share of the Annual Estimate. Payments for any fractional calendar month shall be prorated.

The term "**Operating Expenses**" means all costs and expenses of any kind or description whatsoever incurred or accrued each calendar year by Landlord with respect to the Building (including the Building's Share of Project of all costs and expenses of any kind or description incurred or accrued by Landlord with respect to the Project which are not specific to the Building) (including, without duplication, (u) Taxes (as defined in Section 9), (v) the cost of upgrades to the Building or Project or enhanced services provided at the Building and/or Project which are intended to promote and protect health and physical well-being (collectively, "**Infectious Conditions**"), (w) Permitted Capital Improvements (as defined below) amortized over the useful life of such Permitted Capital Improvements as reasonably determined by Landlord taking into account all relevant factors, including the 24x7 operation of the Building, (x) the actual costs and expenses incurred by Landlord (including, without limitation, any subsidies which Landlord may provide in connection with the common area amenities (the "**Common Area Amenities**")) of the Common Area Amenities now or hereafter located at the Project, (y) the costs related to any parking structure or parking areas serving the Project and costs for transportation services (including costs associated with Landlord's operation of or participation in a shuttle service), and (z) the costs of Landlord's third party property manager (not to exceed 3% of the then-current Base Rent) or, if there is no third party property manager, administration rent in the amount of 3% of the then-current Base Rent (provided that during the Abatement Period, Tenant shall nonetheless be required to pay administration rent each month equal to the amount of the administration rent that Tenant would have been required to pay in the absence of there being an Abatement Period)), excluding only:

(a)the original construction costs of the Project (including the Building) and renovation prior to the Commencement Date and costs of correcting defects in such original construction or renovation;

(b)capital expenditures other than those capital repairs improvements and replacements that: (1) are required in order to comply with Legal Requirements (other than compliance with those Legal Requirements for which Landlord is, at Landlord's sole cost and expense, responsible for compliance with

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pursuant the provisions of the first sentence of the second paragraph of Section 7 below); (2) actually reduce Operating Expenses, (3) maintain or improve the utility, efficiency or capacity of the Building, any Building Systems or the Common Areas of the Project, (4) are incurred in connection with repairs that extend the life of any capital items and/or (5) are triggered by Tenant's particular use of the Premises or Tenant's Alterations (collectively, "**Permitted Capital Improvements**"); provided, that, notwithstanding the foregoing with respect to those Permitted Capital Improvements incurred by Landlord which are solely intended to reduce Operating Expenses, Landlord shall be limited to passing through as part of Operating Expenses each year no more than the annual savings reasonably anticipated in connection with such Permitted Capital Improvements;

(c)interest, principal payments of Mortgage (as defined in Section 27) debts of Landlord, financing costs and amortization of funds borrowed by Landlord, whether secured or unsecured, and all payments of base rent (but not taxes or operating expenses) under any ground lease or other underlying lease of all or any portion of the Project;

(d)depreciation of the Project (except for capital improvements, the cost of which are includable in Operating Expenses);

(e)advertising, legal and space planning expenses and leasing commissions and other costs and expenses incurred in procuring and leasing space to tenants for the Project, including any leasing office maintained in the Project, free rent and construction allowances for tenants;

(f)legal and other expenses incurred in the negotiation or enforcement of leases;

(g)completing, fixturing, improving, renovating, painting, redecorating or other work, which Landlord pays for or performs for other tenants within their premises, and costs of correcting defects in such work;

(h)costs to be reimbursed by other tenants of the Project or Taxes to be paid directly by Tenant or other tenants of the Project, whether or not actually paid;

(i)salaries, wages, benefits and other compensation paid to (i) personnel of Landlord or its agents or contractors above the position of the person, regardless of title, who has day-to-day management responsibility for the Project or (ii) officers and employees of Landlord or its affiliates who are not assigned in whole or in part to the operation, management, maintenance or repair of the Project; provided, however, that with respect to any such person who does not devote substantially all of his or her employed time to the Project, the salaries, wages, benefits and other compensation of such person shall be prorated to reflect time spent on matters related to operating, managing, maintaining or repairing the Project in comparison to the time spent on matters unrelated to operating, managing, maintaining or repairing the Project;

(j)general organizational, administrative and overhead costs relating to maintaining Landlord's existence, either as a corporation, partnership, or other entity, including general corporate, legal and accounting expenses;

(k)costs (including reasonable attorneys' fees and costs of settlement, judgments and payments in lieu thereof) incurred in connection with disputes with tenants, other occupants, or prospective tenants, and costs and expenses, including legal fees, incurred in connection with negotiations or disputes with employees, consultants, management agents, leasing agents, purchasers or mortgagees of the Building;

(l)costs incurred by Landlord due to the violation by Landlord, its employees, agents or contractors or any tenant of the terms and conditions of any lease of space in the Project or any Legal Requirement (as defined in Section 7);

(m)penalties, fines or interest incurred as a result of Landlord's inability or failure to make payment of Taxes and/or to file any tax or informational returns when due, or from Landlord's failure to make any payment of Taxes required to be made by Landlord hereunder before delinquency;

(n)overhead and profit increment paid to Landlord or to subsidiaries or affiliates of Landlord for goods and/or services in or to the Project to the extent the same exceeds the costs of such goods and/or services rendered by unaffiliated third parties on a competitive basis;

(o)costs of Landlord's charitable or political contributions, or of fine art maintained at the Project;

(p)costs in connection with services (including electricity), items or other benefits of a type which are not standard for the Project and which are not available to Tenant without specific charges therefor, but which are provided to another tenant or occupant of the Project, whether or not such other tenant or occupant is specifically charged therefor by Landlord;

(q)costs incurred in the sale or refinancing of the Project;

(r)net income taxes of Landlord or the owner of any interest in the Project, franchise, capital stock, gift, estate or inheritance taxes or any federal, state or local documentary taxes imposed against the Project or any portion thereof or interest therein;

(s)costs of repairs or other work necessitated by fire, windstorm or other casualty; provided such costs of repairs or other work shall be paid by the parties in accordance with the provisions of Section 18;

(t)costs or expenses occasioned by condemnation;

(u)costs which are covered by and reimbursed under any contractor, manufacturer or supplier warranty (not including the reasonable, out-of-pocket costs of enforcement of such warranties);

(v)any expenses otherwise includable within Operating Expenses to the extent actually reimbursed by persons other than tenants of the Project under leases for space in the Project;

(w)any reserves (other than reserves for Taxes for the then-current year);

(x)(i) insurance deductibles in excess of deductibles that Tenant can demonstrate are in excess of customary deductible amounts carried by institutional owners of Class A laboratory/office buildings in the San Carlos area and (ii) the cost of any uninsured casualty to the extent Tenant's Share thereof exceeds $750,000 provided, however, Tenant's Share of any insurance deductible or uninsured casualty which Landlord is permitted to include as part of Operating Expenses exceeding $100,000 shall be amortized over a period of 10 years (with interest not to exceed 8% per annum); and

(y)any costs incurred to remove, study, test or remediate, or otherwise related to the presence of Hazardous Materials in or about the Building or the Project for which Tenant is not responsible under this Lease.

Within 90 days after the end of each calendar year (or such longer period as may be reasonably required), Landlord shall furnish to Tenant a statement (an "**Annual Statement**") showing in reasonable detail: (a) the total and Tenant's Share of actual Operating Expenses for the previous calendar year, and (b) the total of Tenant's payments in respect of Operating Expenses for such year. If Tenant's Share of actual Operating Expenses for such year exceeds Tenant's payments of Operating Expenses for such year, the excess shall be due and payable by Tenant as Rent within 30 days after delivery of such Annual Statement to Tenant. If Tenant's payments of Operating Expenses for such year exceed Tenant's Share of actual Operating Expenses for such year Landlord shall pay the excess to Tenant within 30 days after delivery of such Annual Statement, except that after the expiration, or earlier termination of the Term or if Tenant is delinquent in its obligation to pay Rent, Landlord shall pay the excess to Tenant after deducting all other amounts due Landlord. Landlord's and Tenant's obligations to pay any overpayments or deficiencies due pursuant to this paragraph shall survive the expiration or earlier termination of this Lease.

The Annual Statement shall be final and binding upon Tenant unless Tenant, within 120 days after Tenant's receipt thereof, shall contest any item therein by giving written notice to Landlord, specifying each item contested and the reason therefor. If, during such 120 day period, Tenant reasonably and in good faith questions or contests the accuracy of Landlord's statement of Tenant's Share of Operating Expenses, Landlord will provide Tenant with access to Landlord's books and records relating to the operation of the Project (the "**Expense Information**"). If after Tenant's review of such Expense Information, Landlord and Tenant cannot agree upon the amount of Tenant's Share of Operating Expenses, then Tenant shall have the right to have an independent regionally or nationally recognized public accounting firm selected by Tenant and approved by Landlord (which approval shall not be unreasonably withheld, conditioned or delayed), working pursuant to a fee arrangement other than a contingent fee (at Tenant's sole cost and expense except as expressly provided below), audit and/or review the Expense Information for the year in question (the "**Independent Review**"). The results of any such Independent Review shall be binding on Landlord and Tenant. If the Independent Review shows that the payments actually made by Tenant with respect to Operating Expenses for the calendar year in question exceeded Tenant's Share of Operating Expenses for such calendar year, Landlord shall at

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Landlord's option either (i) credit the excess amount to the next succeeding installments of estimated Operating Expenses or (ii) pay the excess to Tenant within 30 days after delivery of such statement, except that after the expiration or earlier termination of this Lease or if Tenant is delinquent in its obligation to pay Rent, Landlord shall pay the excess to Tenant after deducting all other amounts due Landlord. If the Independent Review shows that Tenant's payments with respect to Operating Expenses for such calendar year were less than Tenant's Share of Operating Expenses for the calendar year, Tenant shall pay the deficiency to Landlord within 30 days after delivery of such statement. If the Independent Review shows that Tenant has overpaid with respect to Operating Expenses by more than 5% then Landlord shall reimburse Tenant for all costs incurred by Tenant for the Independent Review. Operating Expenses for the calendar years in which Tenant's obligation to share therein begins and ends shall be prorated. Notwithstanding anything set forth herein to the contrary, if the Project is not at least 95% occupied on average during any year of the Term, Tenant's Share of Operating Expenses for such year shall be computed as though the Project had been 95% occupied on average during such year.

"**Tenant's Share**" shall be the percentage set forth on the first page of this Lease as Tenant's Share as reasonably adjusted by Landlord for changes in the physical size of the Premises or the Project occurring thereafter. Landlord and Tenant hereby stipulate to the rentable square footage of the Premises set forth on page 1 of this Lease for all purposes and the same shall not be subject to re-measurement. Landlord may equitably increase Tenant's Share for any item of expense or cost reimbursable by Tenant that relates to a repair, replacement, or service that benefits only the Premises or only a portion of the Project that includes the Premises or that varies with occupancy or use. Base Rent, Tenant's Share of Operating Expenses and all other amounts payable by Tenant to Landlord hereunder are collectively referred to herein as "**Rent**."

6.**Security Deposit**. Tenant shall deposit with Landlord, upon delivery of an executed copy of this Lease to Landlord, a security deposit (the "**Security Deposit**") for the performance of all of Tenant's obligations hereunder in the amount set forth on page 1 of this Lease, which Security Deposit, subject to the immediately following paragraph, shall be in the form of an unconditional and irrevocable letter of credit (the "**Letter of Credit**"): (i) in form and substance reasonably satisfactory to Landlord, (ii) naming Landlord as beneficiary, (iii) expressly allowing Landlord to draw upon it at any time from time to time by delivering to the issuer notice that Landlord is entitled to draw thereunder, (iv) issued by an FDIC-insured financial institution reasonably satisfactory to Landlord, and (v) redeemable by presentation of a sight draft in the State of California. If Tenant does not provide Landlord with a substitute Letter of Credit complying with all of the requirements hereof at least 10 days before the stated expiration date of any then current Letter of Credit, Landlord shall have the right to draw the full amount of the current Letter of Credit and hold the funds drawn in cash without obligation for interest thereon as the Security Deposit. The Security Deposit shall be held by Landlord as security for the performance of Tenant's obligations under this Lease. The Security Deposit is not an advance rental deposit or a measure of Landlord's damages in case of Tenant's default. Upon each occurrence of a Default (as defined in Section 20), Landlord may use all or any part of the Security Deposit to pay delinquent payments due under this Lease, future rent damages under California Civil Code Section 1951.2, and the cost of any damage, injury, expense or liability caused by such Default, without prejudice to any other remedy provided herein or provided by law. Landlord's right to use the Security Deposit under this Section 6 includes the right to use the Security Deposit to pay future rent damages following the termination of this Lease pursuant to Section 21(c) below. Upon any use of all or any portion of the Security Deposit, Tenant shall pay Landlord on demand the amount that will restore the Security Deposit to the amount set forth on Page 1 of this Lease. Tenant hereby waives the provisions of any law, now or hereafter in force, including, without limitation, California Civil Code Section 1950.7, which provide that Landlord may claim from a security deposit only those sums reasonably necessary to remedy defaults in the payment of Rent, to repair damage caused by Tenant or to clean the Premises, it being agreed that Landlord may, in addition, claim those sums reasonably necessary to compensate Landlord for any other loss or damage, foreseeable or unforeseeable, caused by the act or omission of Tenant or any officer, employee, agent or invitee of Tenant. Upon bankruptcy or other debtor-creditor proceedings against Tenant, the Security Deposit shall be deemed to be applied first to the payment of Rent and other charges due Landlord for periods prior to

the filing of such proceedings. If Tenant shall fully perform every provision of this Lease to be performed by Tenant, the Security Deposit, or any balance thereof (i.e., after deducting therefrom all amounts to which Landlord is entitled under the provisions of this Lease), shall be returned to Tenant (or, at Landlord's option, to the last assignee of Tenant's interest hereunder) within 90 days after the expiration or earlier termination of this Lease.

Tenant has advised Landlord that Tenant requires additional time to obtain the Letter of Credit. The parties hereto agree that Tenant shall deposit the sum of $415,696.48 in cash with Landlord as the Security Deposit under the Lease until such time as Tenant delivers to Landlord the Letter of Credit, in a form approved by Landlord, which shall be no later than the date that is 10 days after the date of the Lease. Promptly upon delivery of the approved and effective Letter of Credit to Landlord, Landlord shall return the cash security deposit to Tenant. Tenant's failure to deliver such Letter of Credit to Landlord pursuant to the terms of this paragraph shall constitute a Default under Section 20 of the Lease.

If Landlord transfers its interest in the Project or this Lease, Landlord shall either (a) transfer any Security Deposit then held by Landlord to a person or entity assuming Landlord's obligations under this Section 6, or (b) return to Tenant any Security Deposit then held by Landlord and remaining after the deductions permitted herein. Upon such transfer to such transferee or the return of the Security Deposit to Tenant, Landlord shall have no further obligation with respect to the Security Deposit, and Tenant's right to the return of the Security Deposit shall apply solely against Landlord's transferee. The Security Deposit is not an advance rental deposit or a measure of Landlord's damages in case of Tenant's default. Landlord's obligation respecting the Security Deposit is that of a debtor, not a trustee, and no interest shall accrue thereon.

If, as of the expiration of the 12th month of the Base Term, Tenant satisfies the requirements listed below (collectively, the "**Reduction Requirements**"), then the Security Deposit shall be reduced to an amount equal to 1 month's then applicable monthly Base Rent (the "**Reduced Security Deposit**"). The Reduction Requirements are: (i) Tenant is not then in default under the Lease, (ii) Tenant has not previously defaulted under the Lease and (iii) either (x) Tenant's stock shall be listed on either the New York Stock Exchange or the NASDAQ stock market, and Tenant shall have a net worth of at least $300,000,000; or (y) Tenant's revenues exceed $175,000,000 during the immediately preceding fiscal year, and the amount of Tenant's Liquid Assets (as defined below) equals or exceeds its anticipated expenses for the shorter of (A) the next ensuing 30 months, or (B) the greater of 12 months or the remaining Term of this Lease assuming the exercise of all options to extend the Term of this Lease, unless such options have been waived or are otherwise no longer exercisable, as such net revenues are certified by a nationally recognized, independent public accounting firm or as demonstrated in annual audited financial statements. For purposes of this provision, "**Liquid Assets**" means all cash, cash equivalent investments and liquid short term investments. If Tenant provides Landlord with written evidence reasonably satisfactory to Landlord Tenant has met the Reduction Requirements, then Landlord shall return the unapplied portion of the Security Deposit then held by Landlord, less the Reduced Security Deposit, to Tenant within 60 days of Tenant's delivery of such written evidence. If Landlord returns to Tenant any portion of the Security Deposit in accordance with this Section, then from and after the date such monies are returned to Tenant, the "**Security Deposit**" shall be deemed to be the Reduced Security Deposit for all purposes of this Lease.

The Reduced Security Deposit shall be increased in accordance with the terms of this Section if (i) Tenant is in Default hereunder, or (ii) Tenant fails at any time after reduction of the Security Deposit to continue to meet the Reduction Requirements. Landlord shall have the right (not to be exercised more than 2 times per calendar year) to request written evidence from Tenant that Tenant continues to meet the Reduction Requirements. If Tenant is in Default under this Lease or fails to continue to meet the Reduction Requirements, the Security Deposit shall be increased to an amount equal to 2 times the then applicable monthly Base Rent. Such increased Security Deposit shall be paid to Landlord within 10 days of Landlord's written demand, in the case of Tenant's Default under this Lease, or within 10 days of Landlord's written demand, in the case of Tenant's failure to meet the Reduction

Requirements. If Tenant is required to increase the Reduced Security Deposit in accordance with this Section, then from and after the date such monies are deposited with Landlord, the "**Security Deposit**" shall be deemed to be the amount then held by Landlord hereunder.

7.**Use**. The Premises shall be used solely for the Permitted Use set forth in the basic lease provisions on page 1 of this Lease, and in compliance with all laws, orders, judgments, ordinances, regulations, codes, directives, permits, licenses, covenants and restrictions now or hereafter applicable to the Premises, and to the use and occupancy thereof, including, without limitation, the Americans With Disabilities Act, 42 U.S.C. § 12101, et seq. (together with the regulations promulgated pursuant thereto, "**ADA**") (collectively, "**Legal Requirements**" and each, a "**Legal Requirement**"). Tenant shall, upon 7 days' written notice from Landlord, discontinue any use of the Premises which is declared by any Governmental Authority (as defined in Section 9) having jurisdiction to be a violation of a Legal Requirement. Tenant will not use or permit the Premises to be used for any purpose or in any manner that would void Tenant's or Landlord's insurance, increase the insurance risk, or cause the disallowance of any sprinkler or other credits. The Permitted Use as defined in this Lease will not result in the voidance of or an increased insurance risk or cause the disallowance of any sprinkler or other credits with respect to the insurance currently being maintained by Landlord. Tenant shall not permit any part of the Premises to be used as a "place of public accommodation", as defined in the ADA or any similar legal requirement. Tenant shall reimburse Landlord promptly upon written demand for any additional premium charged for any such insurance policy by reason of Tenant's failure to comply with the provisions of this Section or otherwise caused by Tenant's use and/or occupancy of the Premises. Tenant will use the Premises in a careful, safe and proper manner and will not commit or permit waste, overload the floor or structure of the Premises, subject the Premises to use that would damage the Premises or obstruct or interfere with the rights of Landlord or other tenants or occupants of the Project, including conducting or giving notice of any auction, liquidation, or going out of business sale on the Premises, or using or allowing the Premises to be used for any unlawful purpose. Tenant shall cause any equipment or machinery to be installed in the Premises so as to reasonably prevent sounds or vibrations from the Premises from extending into Common Areas, or other space in the Project. Tenant shall not place any machinery or equipment which would overload the floor in or upon the Premises or transport or move such items through the Common Areas of the Project or in the Project elevators without the prior written consent of Landlord, which consent shall not be unreasonably withheld, conditioned or delayed. Except as may be provided under the Work Letter, Tenant shall not, without the prior written consent of Landlord (which consent shall not be unreasonably withheld, conditioned or delayed), use the Premises in any manner which will require ventilation, air exchange, heating, gas, steam, electricity or water beyond the existing capacity of the Project as proportionately allocated to the Premises based upon Tenant's Share as usually furnished for the Permitted Use.

Landlord shall (a) subject to the terms of the Work Letter, be responsible for the compliance of the Premises with Legal Requirements as of the Commencement Date, and, (b) at no cost or expense to Tenant, be responsible for the compliance of the Common Areas of the Project with Legal Requirements as of the Commencement Date. Following the Commencement Date, Landlord shall, as an Operating Expense (to the extent such Legal Requirement is generally applicable to similar buildings in the area in which the Project is located) or at Tenant's expense (to the extent such Legal Requirement is triggered by reason of Tenant's, as compared to other tenants of the Project, particular use of the Premises or Tenant's Alterations) make any alterations or modifications to the Common Areas or the exterior of the Building that are required by Legal Requirements. Except as provided in the 2 immediately preceding sentences, Tenant, at its sole expense, shall make any alterations or modifications to the interior or the exterior of the Premises or the Project that are required by Legal Requirements (including, without limitation, compliance of the Premises with the ADA) related to Tenant's particular use of the Premises. Notwithstanding any other provision herein to the contrary, Tenant shall be responsible for any and all demands, claims, liabilities, losses, costs, expenses, actions, causes of action, damages or judgments, and all reasonable expenses incurred in investigating or resisting the same (including, without limitation, reasonable attorneys' fees, charges and disbursements and costs of suit) (collectively, "**Claims**") arising out of or in connection with Legal Requirements related to Tenant's particular use of the Premises or Tenant's

Alterations, and Tenant shall indemnify, defend, hold and save Landlord harmless from and against any and all Claims arising out of or in connection with any failure of the Premises to comply with any Legal Requirement related to Tenant's particular use of the Premises or Tenant's Alterations.

Tenant acknowledges that Landlord may, but shall not be obligated to, seek to obtain Leadership in Energy and Environmental Design (LEED), WELL Building Standard, or other similar "green" certification with respect to the Project and/or the Premises, and Tenant agrees, at no material cost to Tenant, to reasonably cooperate with Landlord, and to provide such information and/or documentation as Landlord may reasonably request, in connection therewith.

8.**Holding Over**. If, with Landlord's express written consent, Tenant retains possession of the Premises after the termination of the Term, (i) unless otherwise agreed in such written consent, such possession shall be subject to immediate termination by Landlord at any time, (ii) all of the other terms and provisions of this Lease (including, without limitation, the adjustment of Base Rent pursuant to Section 4 hereof) shall remain in full force and effect (excluding any expansion or renewal option or other similar right or option) during such holdover period, (iii) Tenant shall continue to pay Base Rent in the amount payable upon the date of the expiration or earlier termination of this Lease or such other amount as may be agreed upon by Landlord and Tenant in such written consent, and (iv) all other payments shall continue under the terms of this Lease. If Tenant remains in possession of the Premises after the expiration or earlier termination of the Term without the express written consent of Landlord, (A) Tenant shall become a tenant at sufferance upon the terms of this Lease except that the monthly rental shall be equal to 150% of Base Rent in effect during the last 30 days of the Term, plus Operating Expenses and all other amounts due under this Lease, and (B) Tenant shall be responsible for all damages suffered by Landlord resulting from or occasioned by Tenant's holding over, including consequential damages; provided, however, that if Tenant delivers a written inquiry to Landlord within 30 days prior to the expiration or earlier termination of the Term, Landlord will notify Tenant whether the potential exists for consequential damages. No holding over by Tenant, whether with or without consent of Landlord, shall operate to extend this Lease except as otherwise expressly provided, and this Section 8 shall not be construed as consent for Tenant to retain possession of the Premises. Acceptance by Landlord of Rent after the expiration of the Term or earlier termination of this Lease shall not result in a renewal or reinstatement of this Lease.

9.**Taxes**. Landlord shall pay, as part of Operating Expenses, all taxes, levies, fees, assessments and governmental charges of any kind, existing as of the Commencement Date or thereafter enacted (collectively referred to as "**Taxes**"), imposed by any federal, state, regional, municipal, local or other governmental authority or agency, including, without limitation, quasi-public agencies (collectively, "**Governmental Authority**") during the Term, including, without limitation, all Taxes: (i) imposed on or measured by or based, in whole or in part, on rent payable to (or gross receipts received by) Landlord under this Lease and/or from the rental by Landlord of the Project or any portion thereof, or (ii) based on the square footage, assessed value or other measure or evaluation of any kind of the Premises or the Project, or (iii) assessed or imposed by or on the operation or maintenance of any portion of the Premises or the Project, including parking, or (iv) assessed or imposed by, or at the direction of, or resulting from Legal Requirements, or interpretations thereof, promulgated by any Governmental Authority, or (v) imposed as a license or other fee, charge, tax, or assessment on Landlord's business or occupation of leasing space in the Project. Landlord may contest by appropriate legal proceedings the amount, validity, or application of any Taxes or liens securing Taxes. Notwithstanding anything to the contrary herein, Landlord shall only charge Tenant for assessments as if those assessments were paid by Landlord over the longest possible term which Landlord is permitted to pay for the applicable assessments without additional charge other

than interest, if any, provided under the terms of the underlying assessments. Taxes shall not include any net income taxes imposed on Landlord except to the extent such net income taxes are in substitution for any Taxes payable hereunder. If any such Tax is levied or assessed directly against Tenant, then Tenant shall be responsible for and shall pay the same at such times and in such manner as the taxing authority shall require. Tenant shall pay, prior to delinquency, any and all Taxes levied or assessed against any personal property or trade fixtures placed

by Tenant in the Premises, whether levied or assessed against Landlord or Tenant. If any Taxes on Tenant's personal property or trade fixtures are levied against Landlord or Landlord's property, or if the assessed valuation of the Project is increased by a value attributable to improvements in or alterations to the Premises, whether owned by Landlord or Tenant and whether or not affixed to the real property so as to become a part thereof, higher than the base valuation on which Landlord from time-to-time allocates Taxes to all tenants in the Project, Landlord shall have the right, but not the obligation, to pay such Taxes. Landlord's determination of any excess assessed valuation shall be binding and conclusive, absent manifest error. The amount of any such payment by Landlord shall constitute Additional Rent due from Tenant to Landlord immediately upon demand.

10.**Parking**. Subject to all applicable Legal Requirements, Force Majeure, a Taking (as defined in Section 19 below) and the exercise by Landlord of its rights hereunder, Tenant shall have the right, at no additional cost during the Term (including any Extension Term), in common with other tenants of the Project pro rata in accordance with the rentable area of the Premises and the rentable areas of the Project occupied by such other tenants, to park in those areas designated for non-reserved parking, subject in each case to Landlord's rules and regulations. Subject to the immediately preceding sentence, Tenant's pro rata share of parking space shall be equal to 2.8 parking spaces per 1,000 rentable square feet of the Premises. Landlord may allocate parking spaces among Tenant and other tenants in the Project pro rata as described above if Landlord determines that such parking facilities are becoming crowded. Landlord shall not oversubscribe parking among tenants leasing space at the Project. Landlord shall not be responsible for enforcing Tenant's parking rights against any third parties, including other tenants of the Project.

If applicable to the Project, Tenant shall comply with the requirements of any TDMP (as defined below) which may be required by the City of San Carlos or other Governmental Authority with respect to the parking areas at the Project which are binding on tenants in the Project or tenants using the parking lots or structures available at the Project. A copy of any TDMP in effect from time to time during the Term shall be made available to Tenant. Notwithstanding anything to the contrary contained in this Lease, if applicable to the Project, Tenant shall be required to comply with the requirements of (and Operating Expenses shall expressly include any costs incurred by Landlord to comply with) any transportation demand management plan ("**TDMP**") and any other permit conditions (e.g. rider sharing and carpooling initiatives) imposed by the City of San Carlos or other Governmental Authority.

11.**Utilities, Services**. Landlord shall provide, subject to the terms of this Section 11, potable water, electricity, HVAC, light, power, sewer, and other utilities (including gas and fire sprinklers to the extent the Project is plumbed for such services), and, with respect to the Common Areas only, refuse and trash collection and janitorial services (collectively, "**Utilities**"). Landlord shall pay, as Operating Expenses or subject to Tenant's reimbursement obligation, for all Utilities used on the Premises, all maintenance charges for Utilities, and any storm sewer charges or other similar charges for Utilities imposed by any Governmental Authority or Utility provider, and any taxes, penalties, surcharges or similar charges thereon. Landlord may cause, at Landlord's expense (except to the extent necessary as a result of Tenant's disproportionate usage

of Utilities), any Utilities not otherwise separately metered as part of the Tenant Improvements to be separately metered or charged directly to Tenant by the provider. Tenant shall pay directly to the Utility provider, prior to delinquency, any separately metered Utilities and services which may be furnished to Tenant or the Premises during the Term. Tenant shall pay, as part of Operating Expenses, its share of all charges for jointly metered Utilities based upon consumption, as reasonably determined by Landlord. Landlord's charge(s) for utilities shall not include any markup thereon. No interruption or failure of Utilities, from any cause whatsoever other than Landlord's willful misconduct, shall result in eviction or constructive eviction of Tenant, termination of this Lease or, except as provided in the immediately following paragraph, the abatement of Rent. Tenant agrees to limit use of water and sewer with respect to Common Areas to normal restroom use. Tenant shall be responsible during the Term for obtaining and paying for its own janitorial services for the Premises. Utilities shall be available to the Premises 24 hours per day, 7 days per week, except in the case of emergencies, as the result of Legal Requirements, the failure of any Utility provider to provide such Utilities, the performance by

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Landlord or any Utility provider of any installation, maintenance or repairs, or any other temporary interruptions.

Notwithstanding anything to the contrary set forth herein, if (i) a stoppage of an Essential Service (as defined below) to the Premises shall occur and such stoppage is due solely to the gross negligence or willful misconduct of Landlord and not due in any part to any act or omission on the part of Tenant or any Tenant Party or any matter beyond Landlord's reasonable control (any such stoppage of an Essential Service being hereinafter referred to as a "**Service Interruption**"), and (ii) such Service Interruption continues for more than 5 consecutive business days after Landlord shall have received written notice thereof from Tenant, and (iii) as a result of such Service Interruption, the conduct of Tenant's normal operations in the Premises are materially and adversely affected, then there shall be an abatement of one day's Base Rent for each day during which such Service Interruption continues after such 5 business day period; provided, however, that if any part of the Premises is reasonably useable for Tenant's normal business operations or if Tenant conducts all or any part of its operations in any portion of the Premises notwithstanding such Service Interruption, then the amount of each daily abatement of Base Rent shall only be proportionate to the nature and extent of the interruption of Tenant's normal operations or ability to use the Premises. The rights granted to Tenant under this paragraph shall be Tenant's sole and exclusive remedy resulting from a failure of Landlord to provide services, and Landlord shall not otherwise be liable for any loss or damage suffered or sustained by Tenant resulting from any failure or cessation of services. For purposes hereof, the term "**Essential Services**" shall mean the following services: HVAC service, water, sewer and electricity, but in each case only to the extent that Landlord has an obligation to provide same to Tenant under this Lease.

Landlord's sole obligation for either providing an emergency generator or providing emergency back-up power to Tenant shall be: (i) to provide Tenant with its pro rata share of power available to tenants of the Project of the emergency generator serving the Project as of the Commencement Date (which is designed to have a capacity of 1.25 mW), and (ii) to contract with a third party to maintain the emergency generator as per the manufacturer's standard maintenance guidelines. Except as provided in the immediately preceding sentence, Landlord shall have no obligation to provide Tenant with operational an emergency generator or back-up power or to supervise, oversee or confirm that the third party maintaining the emergency generator is maintaining the generator as per the manufacturer's standard guidelines or otherwise. Notwithstanding anything to the contrary contained herein, Landlord shall, on a weekly basis, as part of the maintenance of the Building, run the emergency generator for a period reasonably determined by Landlord for the purpose of determining whether it operates when started. Landlord shall, upon written

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request from Tenant (not more frequently than once per calendar year), make available for Tenant's inspection the maintenance contracts (including contracts regarding provision of fuel for the emergency generator) and maintenance records for the emergency generators for the 12 month period immediately preceding Landlord's receipt of Tenant's written request. During any period of replacement, repair or maintenance of the emergency generators when the emergency generators are not operational, including any delays thereto due to the inability to obtain parts or replacement equipment, Landlord shall have no obligation to provide Tenant with an alternative back-up generator or generators or alternative sources of back-up power. Tenant expressly acknowledges and agrees that Landlord does not guaranty that such emergency generators will be operational at all times or that emergency power will be available to the Premises when needed.

Tenant agrees to provide Landlord with access to Tenant's water and/or energy usage data on a monthly basis, either by providing Tenant's applicable utility login credentials to Landlord's Measurabl online portal, or by another delivery method reasonably agreed to by Landlord and Tenant. The costs and expenses incurred by Landlord in connection with receiving and analyzing such water and/or energy usage data (including, without limitation, as may be required pursuant to applicable Legal Requirements) shall be included as part of Operating Expenses.

12.**Alterations and Tenant's Property**. Any alterations, additions, or improvements made to the Premises by or on behalf of Tenant, including additional locks or bolts of any kind or nature upon

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any doors or windows in the Premises, but excluding installation, removal or realignment of furniture systems (other than removal of furniture systems owned or paid for by Landlord) not involving any modifications to the structure or connections (other than by ordinary plugs or jacks) to Building Systems (as defined in Section 13) ("**Alterations**") shall be subject to Landlord's prior written consent, which may be given or withheld in Landlord's sole discretion if any such Alteration affects the structure or Building Systems and shall not be otherwise unreasonably withheld or delayed. Tenant may construct nonstructural Alterations in the Premises without Landlord's prior approval if the cost of the applicable Alteration project exceed $100,000 (a "**Notice-Only Alteration**"), provided Tenant notifies Landlord in writing of such intended Notice-Only Alteration, and such notice shall be accompanied by plans, specifications, work contracts and such other information concerning the nature and cost of the Notice-Only Alteration as may be reasonably requested by Landlord, which notice and accompanying materials shall be delivered to Landlord not less than 10 business days in advance of any proposed construction. If Landlord approves any Alterations, Landlord may impose reasonable conditions on Tenant in connection with the commencement, performance and completion of such Alterations as Landlord may deem appropriate in Landlord's reasonable discretion. Any request for approval shall be in writing, delivered not less than 15 business days in advance of any proposed construction, and accompanied by plans, specifications, bid proposals, work contracts and such other information concerning the nature and cost of the alterations as may be reasonably requested by Landlord, including the identities and mailing addresses of all persons performing work or supplying materials. Landlord's right to review plans and specifications and to monitor construction shall be solely for its own benefit, and Landlord shall have no duty to ensure that such plans and specifications or construction comply with applicable Legal Requirements. Tenant shall cause, at its sole cost and expense, all Alterations to comply with insurance requirements and with Legal Requirements and shall implement at its sole cost and expense any alteration or modification required by Legal Requirements as a result of any Alterations. Tenant shall pay to Landlord, as Additional Rent, on demand, an amount equal to the reasonable third party out-of-pocket costs incurred by Landlord to review Tenant's plans with respect to each Alteration, not to exceed 3% of the charges incurred by Tenant or its contractors

or agents in connection such Alteration. Before Tenant begins any Alteration, Landlord may post on and about the Premises notices of non-responsibility pursuant to applicable law. Tenant shall reimburse Landlord for, and indemnify and hold Landlord harmless from, any expense incurred by Landlord by reason of faulty work done by Tenant or its contractors, delays caused by such work, or inadequate cleanup.

Tenant shall complete all Alterations work free and clear of liens, and shall provide (and cause each contractor or subcontractor to provide) certificates of insurance for workers' compensation and other coverage in amounts and from an insurance company satisfactory to Landlord protecting Landlord against liability for personal injury or property damage during construction. Upon completion of any Alterations, Tenant shall deliver to Landlord: (i) sworn statements setting forth the names of all contractors and subcontractors who did the work and final lien waivers from all such contractors and subcontractors; and (ii) "as built" plans for any such Alteration.

Except for Removable Installations (as hereinafter defined), all Installations (as hereinafter defined) shall be and shall remain the property of Landlord during the Term and following the expiration or earlier termination of the Term, shall not be removed by Tenant at any time during the Term, and shall remain upon and be surrendered with the Premises as a part thereof. Notwithstanding the foregoing, Landlord shall, if requested by Tenant in writing at the time Landlord's approval of any such Installation is requested or at the time it receives notice of a Notice-Only Alteration, notify Tenant at such time whether Landlord requires that Tenant remove such Installation upon the expiration or earlier termination of the Term, in which event Tenant shall remove such Installation in accordance with the immediately succeeding sentence. Upon the expiration or earlier termination of the Term, Tenant shall remove (i) if required by applicable Legal Requirements, all wires, cables or similar equipment which Tenant has installed in the Premises or in the risers or plenums of the Building, (ii) any Installations for which Landlord has given Tenant notice of removal in accordance with the immediately preceding sentence, and (iii) all of Tenant's Property (as hereinafter defined), and Tenant shall restore and repair any damage caused by or occasioned as a result of such removal, including, without limitation, capping off all such

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connections behind the walls of the Premises and repairing any holes. During any restoration period beyond the expiration or earlier termination of the Term, Tenant shall pay Rent to Landlord as provided herein as if said space were otherwise occupied by Tenant. If Landlord is requested by Tenant or any lender, lessor or other person or entity claiming an interest in any of Tenant's Property to waive any lien Landlord may have against any of Tenant's Property, and Landlord consents to such waiver, then Landlord shall be entitled to be paid as administrative rent a fee of $1,000 per occurrence for its time and effort in preparing and negotiating such a waiver of lien.

Notwithstanding anything to the contrary contained herein, Tenant shall not be required to remove or restore the Tenant Improvements at the expiration or earlier termination of the Term, nor shall Tenant have the right to remove any of the Tenant Improvements at any time during the Term or upon the expiration or earlier termination of the Term.

For purposes of this Lease, (x) "**Removable Installations**" means any items listed on **Exhibit F** attached hereto and any items agreed by Landlord in writing to be included on **Exhibit F** in the future, (y) "**Tenant's Property**" means Removable Installations and, other than Installations, any personal property or equipment of Tenant that may be removed without material damage to the Premises, and (z) "**Installations**" means all property of any kind paid for with the TI Fund, all Alterations, all fixtures, and all partitions, hardware, built-in machinery, built-in casework and cabinets and other similar additions, equipment, property and

improvements built into the Premises so as to become an integral part of the Premises, including, without limitation, fume hoods which penetrate the roof or plenum area, built-in cold rooms, built-in warm rooms, walk-in cold rooms, walk-in warm rooms, deionized water systems, glass washing equipment, autoclaves, chillers, built-in plumbing, electrical and mechanical equipment and systems, and any power generator and transfer switch.

Landlord hereby approves of Tenant's installation within the Premises, at Tenant's sole cost and expense, of a boiler for purposes of steam generation for cleaning and sterilizing Tenant's laboratory equipment. Such boiler installation shall constitute an Alteration subject to the terms of this Section 12.

13.**Landlord's Repairs**. Landlord, as an Operating Expense (except to the extent the cost thereof is excluded from Operating Expenses pursuant to Section 5 hereof), shall maintain all of the structural, exterior, parking and other Common Areas of the Project, including HVAC, electrical, plumbing, fire sprinklers, elevators and all other building systems serving the Premises and other portions of the Project ("**Building Systems**"), in good repair, reasonable wear and tear and uninsured losses and damages caused by Tenant, or by any of Tenant, or by any of Tenant's assignees, sublessees, licensees, agents, servants, employees, invitees and contractors (or any of Tenant's assignees, sublessees and/or licensees respective agents, servants, employees, invitees and contractors) (collectively, "**Tenant Parties**") excluded. Losses and damages caused by Tenant or any Tenant Party shall be repaired by Landlord, to the extent not covered by insurance, at Tenant's sole cost and expense. Landlord reserves the right to stop Building Systems services when necessary (i) by reason of accident or emergency, or (ii) for planned repairs, alterations or improvements, which are, in the reasonable judgment of Landlord, desirable or necessary to be made, until said repairs, alterations or improvements shall have been completed. Landlord shall have no responsibility or liability for failure to supply Building Systems services during any such period of interruption; provided, however, that Landlord shall, except in case of emergency, give Tenant 48 hours advance notice of any planned stoppage of Building Systems services for routine maintenance, repairs, alterations or improvements. Tenant shall promptly give Landlord written notice of any repair required by Landlord pursuant to this Section, after which Landlord shall make a commercially reasonable effort to effect such repair. Landlord shall not be liable for any failure to make any repairs or to perform any maintenance unless such failure shall persist for an unreasonable time after Tenant's written notice of the need for such repairs or maintenance. Tenant waives its rights under any state or local law to terminate this Lease or, except as otherwise expressly provided in Section 31 below, to make such repairs at Landlord's expense and agrees that the parties' respective rights with respect to such matters shall be solely as set forth herein. Repairs required as the result of fire, earthquake, flood, vandalism, war, or similar cause of damage or destruction shall be controlled by Section 18.

14.**Tenant's Repairs**. Subject to Section 13 hereof, Tenant, at its expense, shall repair, replace and maintain in good condition all interior, non-structural portions of the Premises, including, without limitation, entries, doors, ceilings, interior windows, interior walls, and the interior side of demising walls. Should Tenant fail to make any such repair or replacement or fail to maintain the Premises, Landlord shall give Tenant notice of such failure. If Tenant fails to commence cure of such failure within 30 days of Landlord's notice, and thereafter diligently prosecute such cure to completion, Landlord may perform such work and shall be reimbursed by Tenant within 30 days after demand therefor; provided, however, that if such failure by Tenant creates or could create an emergency, Landlord may immediately commence cure of such failure and shall thereafter be entitled to recover the costs of such cure from Tenant. Subject to Sections 17 and 18, Tenant shall bear the full uninsured cost of any repair or replacement to any part of the Project that results from damage caused by Tenant or any Tenant Party.

15.**Mechanic's Liens**. Tenant shall discharge, by bond or otherwise, any mechanic's lien filed against the Premises or against the Project for work claimed to have been done for, or materials claimed to have been furnished to, Tenant within 10 days after Tenant receives written notice of the filing thereof, at Tenant's sole cost and shall otherwise keep the Premises and the Project free from any liens arising out of work performed, materials furnished or obligations incurred by Tenant. Should Tenant fail to discharge any lien described herein, Landlord shall have the right, but not the obligation, to pay such claim or post a bond or otherwise provide security to eliminate the lien as a claim against title to the Project and the cost thereof shall be due from Tenant within 30 days after demand therefor as Additional Rent. If Tenant shall lease or finance the acquisition of office equipment, furnishings, or other personal property of a removable nature utilized by Tenant in the operation of Tenant's business, Tenant warrants that any Uniform Commercial Code Financing Statement filed as a matter of public record by any lessor or creditor of Tenant will upon its face or by exhibit thereto indicate that such Financing Statement is applicable only to removable personal property of Tenant located within the Premises. In no event shall the address of the Project be furnished on the statement without qualifying language as to applicability of the lien only to removable personal property, located in an identified suite held by Tenant.

16.**Indemnification**. Tenant hereby indemnifies and agrees to defend, save and hold Landlord, its officers, directors, employees, managers, agents, sub-agents, constituent entities and lease signators (collectively, "**Landlord Indemnified Parties**") harmless from and against any and all Claims for injury or death to persons or damage to property occurring within or about the Premises or the Project arising directly or indirectly out of the use or occupancy of the Premises or the Project by Tenant or any Tenant Parties (including, without limitation, any act, omission or neglect by Tenant or any Tenant's Parties in or about the Premises or at the Project) or the a breach or default by Tenant in the performance of any of its obligations hereunder, except to the extent caused by the willful misconduct or negligence of Landlord Indemnified Parties. Landlord shall not be liable to Tenant for, and Tenant assumes all risk of damage to, personal property (including, without limitation, loss of records kept within the Premises). Tenant further waives any and all Claims for injury to Tenant's business or loss of income relating to any such damage or destruction of personal property (including, without limitation, any loss of records). Landlord Indemnified Parties shall not be liable for any damages arising from any act, omission or neglect of any tenant in the Project or of any other third party or Tenant Parties.

17.**Insurance**. Landlord shall maintain all risk property and sprinkler damage insurance covering the full replacement cost of the Project. Landlord shall further procure and maintain commercial general liability insurance with a single loss limit of not less than $2,000,000 for bodily injury and property damage with respect to the Project. Landlord may, but is not obligated to, maintain such other insurance and additional coverages as it may deem necessary, including, but not limited to, flood, environmental hazard and earthquake, loss or failure of building equipment, errors and omissions, rental loss during the period of repair or rebuilding, workers' compensation insurance and fidelity bonds for employees employed to perform services and insurance for any improvements installed by Tenant or which are in addition to the standard improvements customarily furnished by Landlord without regard to whether or not such are made a part of the Project. All such insurance shall be included as part of the Operating Expenses. The Project may be included in a blanket policy (in which case the cost of such insurance

allocable to the Project will be determined by Landlord based upon the insurer's cost calculations). Tenant shall also reimburse Landlord for any increased premiums or additional insurance which Landlord reasonably deems necessary as a result of Tenant's use of the Premises.

Tenant, at its sole cost and expense, shall maintain during the Term: all risk property insurance with business interruption and extra expense coverage, covering the full replacement cost of all property and improvements installed or placed in the Premises by Tenant at Tenant's expense; workers' compensation insurance with no less than the minimum limits required by law; employer's liability insurance with employers liability limits of $1,000,000 bodily injury by accident - each accident, $1,000,000 bodily injury by disease - policy limit, and $1,000,000 bodily injury by disease - each employee; and commercial general liability insurance, with a minimum limit of not less than $2,000,000 per occurrence for bodily injury and property damage with respect to the Premises; provided, however, such coverage may be satisfied by a combination of primary and umbrella insurance. The commercial general liability insurance maintained by Tenant shall include Alexandria Real Estate Equities, Inc., and Landlord, its officers, directors, employees, managers, agents, sub-agents, constituent entities and lease signators (collectively, "**Landlord Insured Parties**"), as additional insureds; insure on an occurrence and not a claims-made basis; be issued by insurance companies which have a rating of not less than policyholder rating of A- and financial category rating of at least Class IX in "Best's Insurance Guide"; not contain a hostile fire exclusion; contain a contractual liability endorsement; and provide primary coverage to Landlord Insured Parties (any policy issued to Landlord Insured Parties providing duplicate or similar coverage shall be deemed excess over Tenant's policies, regardless of limits). Tenant shall (i) provide Landlord with 30 days advance written notice of cancellation of such commercial general liability policy, and (ii) request Tenant's insurer to endeavor to provide 30 days advance written notice to Landlord of cancellation of such commercial general liability policy (or 10 days in the event of a cancellation due to non-payment of premium). Certificates of insurance showing the limits of coverage required hereunder and showing Landlord as an additional insured, along with reasonable evidence of the payment of premiums for the applicable period, shall be delivered to Landlord by Tenant (i) concurrent with Tenant's delivery of an executed copy of this Lease to Landlord, and (ii) each renewal of said insurance. Tenant's policy may be a "blanket policy" with an aggregate per location endorsement which specifically provides that the amount of insurance shall not be prejudiced by other losses covered by the policy. Tenant shall, at least 5 days prior to the expiration of such policies, furnish Landlord with renewal certificates.

In each instance where insurance is to name Landlord as an additional insured, Tenant shall upon written request of Landlord also designate and furnish certificates so evidencing Landlord as additional insured to: (i) any lender of Landlord holding a security interest in the Project or any portion thereof, (ii) the landlord under any lease wherein Landlord is tenant of the real property on which the Project is located, if the interest of Landlord is or shall become that of a tenant under a ground or other underlying lease rather than that of a fee owner, and/or (iii) any management company retained by Landlord to manage the Project.

The property insurance obtained by Landlord and Tenant shall include a waiver of subrogation by the insurers and all rights based upon an assignment from its insured, against Landlord or Tenant, and their respective officers, directors, employees, managers, agents, invitees and contractors ("**Related Parties**"), in connection with any loss or damage thereby insured against. Neither party nor its respective Related Parties shall be liable to the other for loss or damage caused by any risk insured against under property insurance required to be maintained hereunder, and each party waives any claims against the other party, and its respective Related Parties, for such loss or damage. The failure of a party to insure its property shall not void this waiver. Landlord and its respective Related Parties shall not be liable for, and Tenant hereby waives all claims against such parties for, business interruption and losses occasioned thereby sustained by Tenant or any person claiming through Tenant resulting from any accident or occurrence in or upon the Premises or the Project from any cause whatsoever. If the foregoing waivers shall contravene any law with respect to exculpatory agreements, the liability of Landlord or Tenant shall be deemed not released but shall be secondary to the other's insurer.

Landlord may require insurance policy limits to be raised to conform with requirements of Landlord's lender and/or to bring coverage limits to levels then being generally required of new tenants within the Project; provided, however, that the increased amount of coverage is reasonably consistent with coverage amounts then being required by Landlord and/or its Affiliates at other projects in the geographical area in which the Project is located.

18.**Restoration**. If, at any time during the Term, the Project or the Premises are damaged or destroyed by a fire or other casualty, Landlord shall notify Tenant within 60 days after discovery of such damage as to the amount of time Landlord reasonably estimates it will take to restore the Project or the Premises, as applicable (the "**Restoration Period**"). If the Restoration Period is estimated to exceed 12 months (the "**Maximum Restoration Period**"), Landlord may, in such notice, elect to terminate this Lease as of the date that is 75 days after the date of discovery of such damage or destruction; provided, however, that notwithstanding Landlord's election to restore, Tenant may elect to terminate this Lease by written notice to Landlord delivered within 10 business days of receipt of a notice from Landlord estimating a Restoration Period for the Premises longer than the Maximum Restoration Period. Unless either Landlord or Tenant so elects to terminate this Lease, Landlord shall, subject to receipt of sufficient insurance proceeds (with any deductible to be treated as a current Operating Expense subject to the terms of Section 5 above), promptly restore the Premises (including the Tenant Improvements, but excluding any other improvements installed by Tenant or by Landlord and paid for by Tenant), subject to delays arising from the collection of insurance proceeds, from Force Majeure events or as needed to obtain any license, clearance or other authorization of any kind required to enter into and restore the Premises issued by any Governmental Authority having jurisdiction over the use, storage, handling, treatment, generation, release, disposal, removal or remediation of Hazardous Materials (as defined in Section 30) in, on or about the Premises (collectively referred to herein as "**Hazardous Materials Clearances**"); provided, however, that if repair or restoration of the Premises is not substantially complete as of the end of the Maximum Restoration Period or, if longer, the Restoration Period, Landlord may, in its sole and absolute discretion, elect not to proceed with such repair and restoration, or Tenant may by written notice to Landlord delivered within 5 business days of the expiration of the Maximum Restoration Period or, if longer, the Restoration Period, elect to terminate this Lease, in which event Landlord shall be relieved of its obligation to make such repairs or restoration and this Lease shall terminate as of the date that is 75 days after the later of: (i) discovery of such damage or destruction, or (ii) the date all required Hazardous Materials Clearances are obtained, but Landlord shall retain any Rent paid and the right to any Rent payable by Tenant prior to such election by Landlord or Tenant.

Promptly following the date that Landlord makes the Premises available to Tenant for Tenant's repairs and restoration, Tenant, at its expense, shall promptly perform, subject to delays arising from the collection of insurance proceeds, from Force Majeure (as defined in Section 34) events or to obtain Hazardous Material Clearances, shall make all repairs or restoration to the improvements in the Premises installed by Tenant or by Landlord paid for by Tenant. Notwithstanding the foregoing, either Landlord or Tenant may terminate this Lease upon written notice to the other if the Premises are damaged during the last year of the Term and Landlord reasonably estimates that it will take more than 2 months to repair such damage; provided, however, that such notice is delivered within 10 business days after the date that Landlord provides Tenant with written notice of the estimated Restoration Period. Notwithstanding anything to the contrary contained herein, Landlord shall also have the right to terminate this Lease if insurance proceeds are not available for such restoration. Rent shall be abated from the date all required Hazardous Material Clearances are obtained until the Premises are repaired and restored, in the proportion which the area of the Premises, if any, which is not usable by Tenant bears to the total area of the Premises, unless Landlord provides Tenant with other space during the period of repair that is suitable for the temporary conduct of Tenant's business. In the event that no Hazardous Material Clearances are required to be obtained by Tenant with respect to the Premises, rent abatement shall commence on the date of discovery of the damage or destruction. Such abatement shall be the sole remedy of Tenant, and except as provided in this Section 18, Tenant waives any right to terminate this Lease by reason of damage or casualty loss.

The provisions of this Lease, including this Section 18, constitute an express agreement between Landlord and Tenant with respect to any and all damage to, or destruction of, all or any part of the Premises, or any other portion of the Project, and any statute or regulation which is now or may hereafter be in effect shall have no application to this Lease or any damage or destruction to all or any part of the Premises or any other portion of the Project, the parties hereto expressly agreeing that this Section 18 sets forth their entire understanding and agreement with respect to such matters.

19.**Condemnation**. If the whole or any material part of the Premises or the Project is taken for any public or quasi-public use under governmental law, ordinance, or regulation, or by right of eminent domain, or by private purchase in lieu thereof (a "**Taking**" or "**Taken**"), and the Taking would in Landlord's reasonable judgment materially interfere with or impair Landlord's ownership or operation of the Building or Property, or would in the reasonable judgment of Landlord and Tenant either prevent or materially interfere with Tenant's use of the Premises (as resolved, if the parties are unable to agree, by arbitration by a single arbitrator with the qualifications and experience appropriate to resolve the matter and appointed pursuant to and acting in accordance with the rules of the American Arbitration Association), then upon written notice by Landlord or Tenant to the other this Lease shall terminate and Rent shall be apportioned as of said date. If part of the Premises shall be Taken, and this Lease is not terminated as provided above, Landlord shall promptly restore the Premises and the Project as nearly as is commercially reasonable under the circumstances to their condition prior to such partial Taking and the rentable square footage of the Building, the rentable square footage of the Premises, Tenant's Share of Operating Expenses and the Rent payable hereunder during the unexpired Term shall be reduced to such extent as may be fair and reasonable under the circumstances. Upon any such Taking, Landlord shall be entitled to receive the entire price or award from any such Taking without any payment to Tenant, and Tenant hereby assigns to Landlord Tenant's interest, if any, in such award. Tenant shall have the right, to the extent that same shall not diminish Landlord's award, to make a separate claim against the condemning authority (but not Landlord) for such compensation as may be separately awarded or recoverable by Tenant for moving expenses and damage to improvements paid for by Tenant and Tenant's trade fixtures, if a separate award for such items is made to Tenant. Tenant hereby waives any and all rights it might otherwise have pursuant to any provision of state law to terminate this Lease upon a partial Taking of the Premises or the Project.

20.**Events of Default**. Each of the following events shall be a default ("**Default**") by Tenant under this Lease:

(a)**Payment Defaults**. Tenant shall fail to pay any installment of Rent or any other payment hereunder when due; provided, however, that Landlord will give Tenant notice and an opportunity to cure any failure to pay Rent within 5 business days of any such notice not more than twice in any 12 month period and Tenant agrees that such notice shall be in lieu of and not in addition to, or shall be deemed to be, any notice required by law.

(b)**Insurance**. Any insurance required to be maintained by Tenant pursuant to this Lease shall be canceled or terminated or shall expire or shall be reduced or materially changed, or Landlord shall receive a notice of nonrenewal of any such insurance and Tenant shall fail to obtain replacement insurance at least 5 days before the expiration of the current coverage.

(c)**Abandonment**. Tenant shall abandon the Premises.

(d)**Improper Transfer**. Tenant shall assign, sublease or otherwise transfer or attempt to transfer all or any portion of Tenant's interest in this Lease or the Premises except as expressly permitted herein, or Tenant's interest in this Lease shall be attached, executed upon, or otherwise judicially seized and such action is not released within 90 days of the action.

(e)**Liens**. Tenant shall fail to discharge or otherwise obtain the release of any lien placed upon the Premises in violation of this Lease within 10 days after Tenant receives written notice that any such lien has been filed against the Premises.

(f)**Insolvency Events**. Tenant or any guarantor or surety of Tenant's obligations hereunder shall: (A) make a general assignment for the benefit of creditors; (B) commence any case, proceeding or other action seeking to have an order for relief entered on its behalf as a debtor or to adjudicate it a bankrupt or insolvent, or seeking reorganization, arrangement, adjustment, liquidation, dissolution or composition of it or its debts or seeking appointment of a receiver, trustee, custodian or other similar official for it or for all or of any substantial part of its property (collectively a "**Proceeding for Relief**"); (C) become the subject of any Proceeding for Relief which is not dismissed within 90 days of its filing or entry; or (D) die or suffer a legal disability (if Tenant, guarantor, or surety is an individual) or be dissolved or otherwise fail to maintain its legal existence (if Tenant, guarantor or surety is a corporation, partnership or other entity).

(g)**Estoppel Certificate or Subordination Agreement**. Tenant fails to execute any document required from Tenant under Sections 23 or 27 within 5 business days after a second notice requesting such document (which second notice may in no event be delivered prior to the expiration of the time period provided in the applicable initial notice to Tenant requesting such documentation).

(h)**Other Defaults**. Tenant shall fail to comply with any provision of this Lease other than those specifically referred to in this Section 20, and, except as otherwise expressly provided herein, such failure shall continue for a period of 30 days after written notice thereof from Landlord to Tenant.

Any notice given under Section 20(h) hereof shall: (i) specify the alleged default, (ii) demand that Tenant cure such default, (iii) be in lieu of, and not in addition to, or shall be deemed to be, any notice required under any provision of applicable law, and (iv) not be deemed a forfeiture or a termination of this Lease unless Landlord elects otherwise in such notice; provided that if the nature of Tenant's default pursuant to Section 20(h) is such that it cannot be cured by the payment of money and reasonably requires more than 30 days to cure, then Tenant shall not be deemed to be in default if Tenant commences such cure within said 30 day period and thereafter diligently prosecutes the same to completion; provided, however, that such cure shall be completed no later than 90 days from the date of Landlord's notice.

21.**Landlord's Remedies**.

(a)**Payment By Landlord; Interest**. Upon a Default by Tenant hereunder, Landlord may, without waiving or releasing any obligation of Tenant hereunder, make such payment or perform such act. All sums so paid or incurred by Landlord, together with interest thereon, from the date such sums were paid or incurred, at the annual rate equal to 12% per annum or the highest rate permitted by law (the "**Default Rate**"), whichever is less, shall be payable to Landlord on demand as Additional Rent. Nothing herein shall be construed to create or impose a duty on Landlord to mitigate any damages resulting from Tenant's Default hereunder.

(b)**Late Payment Rent**. Late payment by Tenant to Landlord of Rent and other sums due will cause Landlord to incur costs not contemplated by this Lease, the exact amount of which will be extremely difficult and impracticable to ascertain. Such costs include, but are not limited to, processing and accounting charges and late charges which may be imposed on Landlord under any Mortgage covering the Premises. Therefore, if any installment of Rent due from Tenant is not received by Landlord within 5 business days after the date such payment is due, Tenant shall pay to Landlord an additional sum equal to 6% of the overdue Rent as a late charge. Notwithstanding the foregoing, before assessing a late charge the first time in any calendar year, Landlord shall provide Tenant written notice of the delinquency and will waive the right if Tenant pays such delinquency within 5 business days thereafter. The parties agree that this late charge represents a fair and reasonable estimate of the costs Landlord will incur by

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reason of late payment by Tenant. In addition to the late charge, Rent not paid when due shall bear interest at the Default Rate from the 5th day after the date due until paid.

(c)**Remedies**. Upon the occurrence of a Default, Landlord, at its option, without further notice or demand to Tenant, shall have in addition to all other rights and remedies provided in this Lease, at law or in equity, the option to pursue any one or more of the following remedies, each and all of which shall be cumulative and nonexclusive, without any notice or demand whatsoever.

(i)Terminate this Lease, or at Landlord's option, Tenant's right to possession only, in which event Tenant shall immediately surrender the Premises to Landlord, and if Tenant fails to do so, Landlord may, without prejudice to any other remedy which it may have for possession or arrearages in rent, enter upon and take possession of the Premises and expel or remove Tenant and any other person who may be occupying the Premises or any part thereof, without being liable for prosecution or any claim or damages therefor;

(ii)Upon any termination of this Lease, whether pursuant to the foregoing Section 21(c)(i) or otherwise, Landlord may recover from Tenant the following:

(1)The worth at the time of award of any unpaid rent which has been earned at the time of such termination; plus

(2)The worth at the time of award of the amount by which the unpaid rent which would have been earned after termination until the time of award exceeds the amount of such rental loss that Tenant proves could have been reasonably avoided; plus

(3)The worth at the time of award of the amount by which the unpaid rent for the balance of the Term after the time of award exceeds the amount of such rental loss that Tenant proves could have been reasonably avoided; plus

(4)Any other amount reasonably necessary to compensate Landlord for all the detriment proximately caused by Tenant's failure to perform its obligations under this Lease or which in the ordinary course of things would be likely to result therefrom, specifically including, but not limited to, brokerage commissions and advertising expenses incurred, expenses of remodeling the Premises or any portion thereof for a new tenant, whether for the same or a different use, and any special commercially reasonable concessions made to obtain a new tenant; and

(5)At Landlord's election, such other amounts in addition to or in lieu of the foregoing as may be permitted from time to time by applicable law.

The term "**rent**" as used in this Section 21 shall be deemed to be and to mean all sums of every nature required to be paid by Tenant pursuant to the terms of this Lease, whether to Landlord or to others. As used in Sections 21(c)(ii)(A) and (B), above, the "**worth at the time of award**" shall be computed by allowing interest at the Default Rate. As used in Section 21(c)(ii)(C) above, the "**worth at the time of award**" shall be computed by discounting such amount at the discount rate of the Federal Reserve Bank of San Francisco at the time of award plus 1%.

(iii)Landlord may continue this Lease in effect after Tenant's Default and recover rent as it becomes due (Landlord and Tenant hereby agreeing that Tenant has the right to sublet or assign hereunder, subject only to reasonable limitations). Accordingly, if Landlord does not elect to terminate this Lease following a Default by Tenant, Landlord may, from time to time, without terminating this Lease, enforce all of its rights and remedies hereunder, including the right to recover all Rent as it becomes due.

(iv)Whether or not Landlord elects to terminate this Lease following a Default by Tenant, Landlord shall have the right to terminate any and all subleases, licenses, concessions or other consensual arrangements for possession entered into by Tenant and affecting the Premises or may, in Landlord's sole discretion, succeed to Tenant's interest in such subleases, licenses, concessions or arrangements. Upon Landlord's election to succeed to Tenant's interest in any such subleases, licenses, concessions or arrangements, Tenant shall, as of the date of notice by Landlord of such election, have no further right to or interest in the rent or other consideration receivable thereunder.

(v)Independent of the exercise of any other remedy of Landlord hereunder or under applicable law, Landlord may conduct an environmental test of the Premises as generally described in Section 30(d) hereof, at Tenant's expense.

(d)**Effect of Exercise**. Exercise by Landlord of any remedies hereunder or otherwise available shall not be deemed to be an acceptance of surrender of the Premises and/or a termination of this Lease by Landlord, it being understood that such surrender and/or termination can be effected only by the express written agreement of Landlord and Tenant. Any law, usage, or custom to the contrary notwithstanding, Landlord shall have the right at all times to enforce the provisions of this Lease in strict accordance with the terms hereof; and the failure of Landlord at any time to enforce its rights under this Lease strictly in accordance with same shall not be construed as having created a custom in any way or manner contrary to the specific terms, provisions, and covenants of this Lease or as having modified the same and shall not be deemed a waiver of Landlord's right to enforce one or more of its rights in connection with any subsequent default. A receipt by Landlord of Rent or other payment with knowledge of the breach of any covenant hereof shall not be deemed a waiver of such breach, and no waiver by Landlord of any provision of this Lease shall be deemed to have been made unless expressed in writing and signed by Landlord. To the greatest extent permitted by law, Tenant waives the service of notice of Landlord's intention to re-enter, re-take or otherwise obtain possession of the Premises as provided in any statute, or to institute legal proceedings to that end, and also waives all right of redemption in case Tenant shall be dispossessed by a judgment or by warrant of any court or judge. Any reletting of the Premises or any portion thereof shall be on such terms and conditions as Landlord in its sole discretion may determine. Landlord shall not be liable

for, nor shall Tenant's obligations hereunder be diminished because of, Landlord's failure to relet the Premises or collect rent due in respect of such reletting or otherwise to mitigate any damages arising by reason of Tenant's Default.

22.**Assignment and Subletting**.

(a)**General Prohibition**. Without Landlord's prior written consent subject to and on the conditions described in this Section 22 (including, without limitation, the second sentence of Section 22(b) below), Tenant shall not, directly or indirectly, voluntarily or by operation of law, assign this Lease or sublease the Premises or any part thereof or mortgage, pledge, or hypothecate its leasehold interest or grant any concession or license within the Premises, and any attempt to do any of the foregoing shall be void and of no effect. If Tenant is a corporation, partnership or limited liability company, the shares or other ownership interests thereof which are not actively traded upon a stock exchange or in the over-the-counter market, a transfer or series of transfers whereby 50% or more of the issued and outstanding shares or other ownership interests of such corporation are, or voting control is, transferred (but excepting transfers upon deaths of individual owners) from a person or persons or entity or entities which were owners thereof at time of execution of this Lease to persons or entities who were not owners of shares or other ownership interests of the corporation, partnership or limited liability company at time of execution of this Lease, shall be deemed an assignment of this Lease requiring the consent of Landlord as provided in this Section 22.

(b)**Permitted Transfers**. If Tenant desires to assign, sublease, hypothecate or otherwise transfer this Lease or sublet the Premises, then at least 15 business days, but not more than 120 days, before the date Tenant desires the assignment or sublease to be effective (the "**Assignment Date**"),

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Tenant shall give Landlord a notice (the "**Assignment Notice**") containing such information about the proposed assignee or sublessee, including the proposed use of the Premises and any Hazardous Materials proposed to be used, stored handled, treated, generated in or released or disposed of from the Premises, the Assignment Date, any relationship between Tenant and the proposed assignee or sublessee, and all material terms and conditions of the proposed assignment or sublease, including a copy of any proposed assignment or sublease in its final form, and such other information as Landlord may deem reasonably necessary or appropriate to its consideration whether to grant its consent. Landlord may, by giving written notice to Tenant within 15 business days after receipt of the Assignment Notice: (i) grant such consent (provided that Landlord shall further have the right to review and approve or disapprove the proposed form of sublease prior to the effective date of any such subletting), (ii) refuse such consent (provided that Landlord shall not unreasonably withhold, condition or delay such consent); or (iii) with respect to any proposed assignment of this Lease, or with respect to any proposed subletting for substantially the remainder of the Term of more than 50% of the Premises, terminate this Lease with respect to the space described in the Assignment Notice as of the Assignment Date (an "**Assignment Termination**"). Among other reasons, it shall be reasonable for Landlord to withhold its consent in any of these instances: (1) the proposed assignee or subtenant is a governmental agency; (2) in Landlord's reasonable judgment, the use of the Premises by the proposed assignee or subtenant would entail any alterations that would materially lessen the value of the leasehold improvements in the Premises, or would require materially increased services by Landlord; (3) in Landlord's reasonable judgment, the proposed assignee or subtenant is engaged in areas of scientific research or other business concerns that are controversial such that they may (i) attract or cause negative publicity for or about the Building or the Project, (ii) negatively affect the reputation of the Building, the Project or Landlord, (iii) attract protestors to the Building or the Project, or (iv) lessen the attractiveness of the Building or the Project to any tenants or prospective tenants, purchasers or

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lenders; (4) in Landlord's reasonable judgment, the proposed assignee or subtenant lacks the creditworthiness to support the financial obligations it will incur under the proposed assignment or sublease; (5) in Landlord's reasonable judgment, the character, reputation, or business of the proposed assignee or subtenant is inconsistent with the desired tenant-mix or the quality of other tenancies in the Project or is inconsistent with the type and quality of the nature of the Building; (6) intentionally omitted; (7) Landlord has experienced previous defaults by or is in litigation with the proposed assignee or subtenant; (8) the use of the Premises by the proposed assignee or subtenant will violate any applicable Legal Requirement; (9) intentionally omitted; or (10) the proposed assignee or subtenant is an entity with whom Landlord is then-currently negotiating to lease space in the Project. If Landlord delivers notice of its election to exercise an Assignment Termination, Tenant shall have the right to withdraw such Assignment Notice by written notice to Landlord of such election within 5 business days after Landlord's notice electing to exercise the Assignment Termination. If Tenant withdraws such Assignment Notice, this Lease shall continue in full force and effect. If Tenant does not withdraw such Assignment Notice, this Lease, and the term and estate herein granted, shall terminate as of the Assignment Date with respect to the space described in such Assignment Notice. No failure of Landlord to exercise any such option to terminate this Lease, or to deliver a timely notice in response to the Assignment Notice, shall be deemed to be Landlord's consent to the proposed assignment, sublease or other transfer. Tenant shall pay to Landlord a fee equal to Two Thousand Five Hundred Dollars ($2,500) in connection with its consideration of any Assignment Notice and/or its preparation or review of any consent documents. Notwithstanding the foregoing, Landlord's consent to an assignment of this Lease or a subletting of any portion of the Premises to any entity controlling, controlled by or under common control with Tenant (a "**Control Permitted Assignment**") shall not be required, provided that Landlord shall have the right to approve the form of any such sublease or assignment, in its reasonable discretion. In addition, Tenant shall have the right to assign this Lease, upon 10 days prior written notice to Landlord ((x) unless Tenant is prohibited from providing such notice by applicable Legal Requirements in which case Tenant shall notify Landlord promptly thereafter, and (y) if the transaction is subject to confidentiality requirements, Tenant's advance notification shall be subject to Landlord's execution of a non-disclosure agreement reasonably acceptable to Landlord and Tenant) but without obtaining Landlord's prior written consent, to a corporation or other entity which is a successor-in-interest to Tenant, by way of merger, consolidation or corporate reorganization, or by the purchase of all or substantially all of the assets or the ownership interests of Tenant provided that (i) such merger or consolidation, or such

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acquisition or assumption, as the case may be, is for a good business purpose and not principally for the purpose of transferring the Lease, and (ii) the net worth (as determined in accordance with generally accepted accounting principles ("**GAAP**")) of the assignee (or a guarantor of the Lease that agrees to guaranty the Lease following the date of the assignment or, to the extent Tenant remains the tenant under this Lease following such Corporate Permitted Assignment, Tenant) is not less than the net worth (as determined in accordance with GAAP) of Tenant as of the date of Tenant's most current quarterly or annual financial statements, and (iii) such assignee shall agree in writing to assume all of the terms, covenants and conditions of this Lease (a "**Corporate Permitted Assignment**"). Control Permitted Assignments and Corporate Permitted Assignments are hereinafter referred to as "**Permitted Assignments**."

(c)**Additional Conditions**. As a condition to any such assignment or subletting, whether or not Landlord's consent is required, Landlord may require:

(i)that any assignee or subtenant agree, in writing at the time of such assignment or subletting, that if Landlord gives such party notice that Tenant is in default under this Lease, such

party shall thereafter make all payments otherwise due Tenant directly to Landlord, which payments will be received by Landlord without any liability except to credit such payment against those due under this Lease, and any such third party shall agree to attorn to Landlord or its successors and assigns should this Lease be terminated for any reason; provided, however, in no event shall Landlord or its successors or assigns be obligated to accept such attornment; and

(ii)A list of Hazardous Materials, certified by the proposed assignee or sublessee to be true and correct, which the proposed assignee or sublessee intends to use, store, handle, treat, generate in or release or dispose of from the Premises, together with copies of all documents relating to such use, storage, handling, treatment, generation, release or disposal of Hazardous Materials by the proposed assignee or subtenant in the Premises or on the Project, prior to the proposed assignment or subletting, including, without limitation: permits; approvals; reports and correspondence; storage and management plans; plans relating to the installation of any storage tanks to be installed in or under the Project (provided, said installation of tanks shall only be permitted after Landlord has given its written consent to do so, which consent may be withheld in Landlord's sole and absolute discretion); and all closure plans or any other documents required by any and all federal, state and local Governmental Authorities for any storage tanks installed in, on or under the Project for the closure of any such tanks. Neither Tenant nor any such proposed assignee or subtenant is required, however, to provide Landlord with any portion(s) of the such documents containing information of a proprietary nature which, in and of themselves, do not contain a reference to any Hazardous Materials or hazardous activities.

(d)**No Release of Tenant, Sharing of Excess Rents**. Notwithstanding any assignment or subletting, Tenant and any guarantor or surety of Tenant's obligations under this Lease shall at all times remain fully and primarily responsible and liable for the payment of Rent and for compliance with all of Tenant's other obligations under this Lease. Other than in connection with an assignment constituting a Permitted Assignment, if the Rent due and payable by a sublessee or assignee (or a combination of the rental payable under such sublease or assignment plus any bonus or other consideration therefor or incident thereto in any form, excluding consideration for services or furniture, fixtures and equipment paid for exclusively by Tenant, to the extent such consideration does not exceed fair market value for such items) exceeds the sum of the rental payable under this Lease, (excluding however, any Rent payable under this Section) and actual and reasonable brokerage fees, legal costs, reasonable free rent periods and other market financial concessions, any design or construction fees or tenant improvements allowances directly related to and required pursuant to the terms of any such sublease, and the unamortized cost of any Alterations or other improvements paid for by Tenant ("**Excess Rent**"), then Tenant shall be bound and obligated to pay Landlord as Additional Rent hereunder 50% of such Excess Rent within 30 days following receipt thereof by Tenant. If Tenant shall sublet the Premises or any part thereof, Tenant hereby immediately and irrevocably assigns to Landlord, as security for Tenant's

obligations under this Lease, all rent from any such subletting, and Landlord or a receiver for Tenant appointed on Landlord's application, may collect such rent and apply it toward Tenant's obligations under this Lease; except that, until the occurrence of a Default, Tenant shall have the right to collect such rent.

(e)**No Waiver**. The consent by Landlord to an assignment or subletting shall not relieve Tenant or any assignees of this Lease or any sublessees of the Premises from obtaining the consent of Landlord to any further assignment or subletting nor shall it release Tenant or any assignee or sublessee of Tenant from full and primary liability under this Lease. The acceptance of Rent hereunder, or the acceptance of

performance of any other term, covenant, or condition thereof, from any other person or entity shall not be deemed to be a waiver of any of the provisions of this Lease or a consent to any subletting, assignment or other transfer of the Premises.

(f)**Prior Conduct of Proposed Transferee**. Notwithstanding any other provision of this Section 22, if (i) the proposed assignee or sublessee of Tenant has been required by any prior landlord, lender or Governmental Authority to take remedial action in connection with Hazardous Materials contaminating a property, where the contamination resulted from such party's action or use of the property in question, (ii) the proposed assignee or sublessee is subject to an enforcement order issued by any Governmental Authority in connection with the use, storage, handling, treatment, generation, release or disposal of Hazardous Materials (including, without limitation, any order related to the failure to make a required reporting to any Governmental Authority), or (iii) because of the existence of a pre-existing environmental condition in the vicinity of or underlying the Project, the risk that Landlord would be targeted as a responsible party in connection with the remediation of such pre-existing environmental condition would be materially increased or exacerbated by the proposed use of Hazardous Materials by such proposed assignee or sublessee, Landlord shall have the absolute right to refuse to consent to any assignment or subletting to any such party. This Section 22(f) shall not apply to any Corporate Permitted Assignment.

23.**Estoppel Certificate**. Tenant shall, within 10 business days of written notice from Landlord, execute, acknowledge and deliver a statement in writing in any form reasonably requested by a proposed lender or purchaser, (i) certifying that this Lease is unmodified and in full force and effect (or, if modified, stating the nature of such modification and certifying that this Lease as so modified is in full force and effect) and the dates to which the rental and other charges are paid in advance, if any, (ii) acknowledging that, to Tenant's knowledge, there are not any uncured defaults on the part of Landlord hereunder, or specifying such defaults if any are claimed, and (iii) setting forth such further information with respect to the status of this Lease or the Premises as may be requested thereon. Any such statement may be relied upon by any prospective purchaser or encumbrancer of all or any portion of the real property of which the Premises are a part. Tenant's failure to deliver such statement within 5 business days after a second notice requesting such document is delivered after Tenant's failure to deliver such statement within the initial 10 business day period above, at the option of Landlord, constitute a Default under this Lease, and, in any event, shall be conclusive upon Tenant that the Lease is in full force and effect and without modification except as may be represented by Landlord in any certificate prepared by Landlord and delivered to Tenant for execution.

24.**Quiet Enjoyment**. So long as Tenant is not in Default under this Lease, Tenant shall, subject to the terms of this Lease, at all times during the Term, have peaceful and quiet enjoyment of the Premises against any person claiming by, through or under Landlord.

25.**Prorations**. All prorations required or permitted to be made hereunder shall be made on the basis of a 360 day year and 30 day months.

26.**Rules and Regulations**. Tenant shall, at all times during the Term and any extension thereof, comply with all reasonable rules and regulations at any time or from time to time established by Landlord covering use of the Premises and the Project. Such rules and regulations may include, without limitation, rules and regulations relating to the use of the Common Area Amenities and/or rules and

regulations which are intended to promote and protect health and physical well-being within the Building and the Project. The current rules and regulations are attached hereto as **Exhibit E**. If there is any conflict

between said rules and regulations and other provisions of this Lease, the terms and provisions of this Lease shall control. Landlord shall not have any liability or obligation for the breach of any rules or regulations by other tenants in the Project and shall not enforce such rules and regulations in a discriminatory manner.

27.**Subordination**. This Lease and Tenant's interest and rights hereunder are hereby made and shall be subject and subordinate at all times to the lien of any Mortgage now existing or hereafter created on or against the Project or the Premises, and all amendments, restatements, renewals, modifications, consolidations, refinancing, assignments and extensions thereof, without the necessity of any further instrument or act on the part of Tenant; provided, however that so long as there is no Default hereunder, Tenant's right to possession of the Premises and rights under this Lease shall not be disturbed by the Holder of any such Mortgage. Tenant agrees, at the election of the Holder of any such Mortgage, to attorn to any such Holder. Tenant agrees upon demand to execute, acknowledge and deliver such instruments, confirming such subordination, and such instruments of attornment as shall be requested by any such Holder, provided any such instruments contain appropriate non-disturbance provisions assuring Tenant's quiet enjoyment of the Premises as set forth in Section 24 hereof. Notwithstanding the foregoing, any such Holder may at any time subordinate its Mortgage to this Lease, without Tenant's consent, by notice in writing to Tenant, and thereupon this Lease shall be deemed prior to such Mortgage without regard to their respective dates of execution, delivery or recording and in that event such Holder shall have the same rights with respect to this Lease as though this Lease had been executed prior to the execution, delivery and recording of such Mortgage and had been assigned to such Holder. The term "**Mortgage**" whenever used in this Lease shall be deemed to include deeds of trust, security assignments and any other encumbrances, and any reference to the "**Holder**" of a Mortgage shall be deemed to include the beneficiary under a deed of trust.

As of the date of this Lease, there is no existing Mortgage encumbering the Project. Upon written request from Tenant, Landlord agrees to use reasonable efforts to cause the Holder of any future Mortgage to enter into a subordination, non-disturbance and attornment agreement ("**SNDA**") with Tenant with respect to this Lease. The SNDA shall be on the form reasonably proscribed by the Holder and Tenant shall pay the Holder's fees and costs in connection with obtaining such SNDA; provided, however, that Landlord shall request that Holder make any changes to the SNDA requested by Tenant. Landlord's failure to cause the Holder to enter into the SNDA with Tenant (or make any of the changes requested by Tenant) despite such efforts shall not be a default by Landlord under this Lease.

28.**Surrender**. Upon the expiration of the Term or earlier termination of Tenant's right of possession, Tenant shall surrender the Premises to Landlord in the same condition as received, subject to any Alterations or Installations permitted under this Lease to remain in the Premises, free of Hazardous Materials brought upon, kept, used, stored, handled, treated, generated in, or released or disposed of from, the Premises by any person other than a Landlord Party (collectively, "**Tenant HazMat Operations**") and released of all Hazardous Materials Clearances, broom clean, ordinary wear and tear and casualty loss and condemnation covered by Sections 18 and 19 excepted. At least 3 months prior to the surrender of the Premises or such earlier date as Tenant may elect to cease operations at the Premises, Tenant shall deliver to Landlord a narrative description of the actions proposed (or required by any Governmental Authority) to be taken by Tenant in order to surrender the Premises (including any Installations permitted by Landlord to remain in the Premises) at the expiration or earlier termination of the Term, free from any residual impact from the Tenant HazMat Operations and otherwise released for unrestricted use and occupancy (the "**Decommissioning and HazMat Closure Plan**"). Such Decommissioning and HazMat Closure Plan shall be accompanied by a current listing of (i) all Hazardous Materials licenses and permits held by or on behalf of any Tenant Party with respect to the Premises, and (ii) all Hazardous Materials used, stored, handled, treated, generated, released or disposed of from the Premises, and shall be subject to the review and approval of Landlord's environmental consultant, such approval not to be unreasonably withheld or delayed. In connection with the review and approval of the

Decommissioning and HazMat Closure Plan, upon the request of Landlord, Tenant shall deliver to Landlord or its consultant such additional non-proprietary information concerning Tenant HazMat Operations as Landlord may reasonably request. On or before such surrender, Tenant shall deliver to Landlord evidence that the approved Decommissioning and HazMat Closure Plan shall have been satisfactorily completed and Landlord shall have the right, subject to reimbursement at Tenant's expense as set forth below, to cause Landlord's environmental consultant to inspect the Premises and perform such additional procedures as may be deemed reasonably necessary to confirm that the Premises are, as of the effective date of such surrender or early termination of the Lease, free from any residual impact from Tenant HazMat Operations. Tenant shall reimburse Landlord, as Additional Rent, for the actual, reasonable out-of-pocket expense incurred by Landlord for Landlord's environmental consultant to review and approve the Decommissioning and HazMat Closure Plan and to visit the Premises and verify satisfactory completion of the same, which cost shall not exceed $2,500. Landlord may not deliver such Decommissioning and HazMat Closure Plan to any third party with the exception of Landlord's environmental consultants, and any prospective purchaser, any prospective tenant, any prospective lender or lender.

If Tenant shall fail to prepare or submit a Decommissioning and HazMat Closure Plan reasonably approved by Landlord, or if Tenant shall fail to complete the approved Decommissioning and HazMat Closure Plan, or if such Decommissioning and HazMat Closure Plan, whether or not approved by Landlord, shall fail to adequately address any residual effect of Tenant HazMat Operations in, on or about the Premises, Landlord shall have the right to take such actions as Landlord may reasonably deem reasonable or appropriate to assure that the Premises and the Project are surrendered free from any residual impact from Tenant HazMat Operations, the cost of which actions shall be reimbursed by Tenant as Additional Rent, without regard to the limitation set forth in the first paragraph of this Section 28.

Tenant shall immediately return to Landlord all keys and/or access cards to parking, the Project, restrooms or all or any portion of the Premises furnished to or otherwise procured by Tenant. If any such access card or key is lost, Tenant shall pay to Landlord, the cost of replacing such lost access card or key. Any Tenant's Property, Alterations and property not so removed by Tenant as permitted or required herein shall be deemed abandoned and may be stored, removed, and disposed of by Landlord at Tenant's expense, and Tenant waives all claims against Landlord for any damages resulting from Landlord's retention and/or disposition of such property. All obligations of Tenant hereunder not fully performed as of the termination of the Term, including the obligations of Tenant under Section 30 hereof, shall survive the expiration or earlier termination of the Term, including, without limitation, indemnity obligations, payment obligations with respect to Rent and obligations concerning the condition and repair of the Premises.

29.**Waiver of Jury Trial**. TO THE EXTENT PERMITTED BY LAW, TENANT AND LANDLORD WAIVE ANY RIGHT TO TRIAL BY JURY OR TO HAVE A JURY PARTICIPATE IN RESOLVING ANY DISPUTE, WHETHER SOUNDING IN CONTRACT, TORT, OR OTHERWISE, BETWEEN LANDLORD AND TENANT ARISING OUT OF THIS LEASE OR ANY OTHER INSTRUMENT, DOCUMENT, OR AGREEMENT EXECUTED OR DELIVERED IN CONNECTION HEREWITH OR THE TRANSACTIONS RELATED HERETO.

30.**Environmental Requirements**.

(a)**Prohibition/Compliance/Indemnity**. Tenant shall not cause or permit any Hazardous Materials (as hereinafter defined) to be brought upon, kept, used, stored, handled, treated, generated in or about, or released or disposed of from, the Premises or the Project in violation of applicable Environmental

Requirements (as hereinafter defined) by Tenant or any Tenant Party. If Tenant breaches the obligation stated in the preceding sentence, or if the presence of Hazardous Materials in the Premises during the Term or any holding over results in contamination of the Premises, the Project or any adjacent property or if contamination of the Premises, the Project or any adjacent property by Hazardous Materials brought into, kept, used, stored, handled, treated, generated in or about, or released or disposed of from, the Premises by anyone other than Landlord and Landlord's employees, agents and contractors

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otherwise occurs during the Term or any holding over, Tenant hereby indemnifies and shall defend and hold Landlord, its officers, directors, employees, agents and contractors harmless from any and all actions (including, without limitation, remedial or enforcement actions of any kind, administrative or judicial proceedings, and orders or judgments arising out of or resulting therefrom), costs, claims, damages (including, without limitation, punitive damages and damages based upon diminution in value of the Premises or the Project, or the loss of, or restriction on, use of the Premises or any portion of the Project), expenses (including, without limitation, reasonable attorneys', consultants' and experts' fees, court costs and amounts paid in settlement of any claims or actions), fines, forfeitures or other civil, administrative or criminal penalties, injunctive or other relief (whether or not based upon personal injury, property damage, or contamination of, or adverse effects upon, the environment, water tables or natural resources), liabilities or losses (collectively, "**Environmental Claims**") which arise during or after the Term as a result of such contamination. This indemnification of Landlord by Tenant includes, without limitation, costs incurred in connection with any investigation of site conditions or any cleanup, treatment, remedial, removal, or restoration work required by any federal, state or local Governmental Authority because of Hazardous Materials present in the air, soil or ground water above, on, or under the Premises. Without limiting the foregoing, if the presence of any Hazardous Materials on the Premises, the Project or any adjacent property caused or permitted by Tenant or any Tenant Party results in any contamination of the Premises, the Project or any adjacent property, Tenant shall promptly take all actions at its sole expense and in accordance with applicable Environmental Requirements as are necessary to return the Premises, the Project or any adjacent property to the condition existing prior to the time of such contamination, provided that Landlord's approval of such action shall first be obtained, which approval shall not unreasonably be withheld, conditioned or delayed so long as such actions would not potentially have any material adverse long-term or short-term effect on the Premises or the Project. Notwithstanding anything to the contrary contained in Section 28 or this Section 30, Tenant shall not be responsible for, and the indemnification and hold harmless obligations set forth in this paragraph shall not apply to (i) contamination in the Premises which Tenant can reasonably prove existed in the Premises prior to the Commencement Date, (ii) the presence of any Hazardous Materials in the Premises which Tenant can reasonably prove migrated from outside the Premises into the Premises, or (iii) contamination caused by Landlord or any Landlord's employees, agents and contractors, except to the extent in any case, the presence of such Hazardous Materials (x) is the result of a breach by Tenant of any of its obligations under this Lease, or (y) was caused, contributed to or exacerbated by Tenant or any Tenant Party.

(b)**Business**. Landlord acknowledges that it is not the intent of this Section 30 to prohibit Tenant from using the Premises for the Permitted Use. Tenant may operate its business according to prudent industry practices so long as the use or presence of Hazardous Materials is strictly and properly monitored according to all then applicable Environmental Requirements. As a material inducement to Landlord to allow Tenant to use Hazardous Materials in connection with its business, Tenant agrees to deliver to Landlord prior to the Commencement Date a list identifying each type of Hazardous Materials expected to be brought upon, kept, used, stored, handled, treated, generated on, or released or disposed of from, the Premises and setting forth any and all governmental approvals or permits required in connection with the presence,

use, storage, handling, treatment, generation, release or disposal of such Hazardous Materials on or from the Premises ("**Hazardous Materials List**"). Upon Landlord's request (not to be requested more frequently than annually), or any time that Tenant is required to deliver a Hazardous Materials List to any Governmental Authority (e.g., the fire department) in connection with Tenant's use or occupancy of the Premises, Tenant shall deliver to Landlord a copy of such Hazardous Materials List. Tenant shall deliver to Landlord true and correct copies of the following documents (the "**Haz Mat Documents**") relating to the use, storage, handling, treatment, generation, release or disposal of Hazardous Materials prior to the Commencement Date, or if unavailable at that time, concurrent with the receipt from or submission to a Governmental Authority: permits; approvals; reports and correspondence; storage and management plans, notice of violations of any Legal Requirements; plans relating to the installation of any storage tanks to be installed in or under the Project (provided, said installation of tanks shall only be permitted after Landlord has given Tenant its written consent to do so, which consent may be withheld in Landlord's sole and absolute discretion); all closure plans or any other documents required by any and all federal, state and local Governmental Authorities for any storage tanks

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installed in, on or under the Project for the closure of any such tanks; and a Decommissioning and HazMat Closure Plan (to the extent surrender in accordance with Section 28 cannot be accomplished in 3 months). Tenant is not required, however, to provide Landlord with any portion(s) of the Haz Mat Documents containing information of a proprietary nature which, in and of themselves, do not contain a reference to any Hazardous Materials or hazardous activities. It is not the intent of this Section to provide Landlord with information which could be detrimental to Tenant's business should such information become possessed by Tenant's competitors.

(c)**Tenant Representation and Warranty**. Tenant hereby represents and warrants to Landlord that (i) neither Tenant nor any of its legal predecessors has been required by any prior landlord, lender or Governmental Authority at any time to take remedial action in connection with Hazardous Materials contaminating a property which contamination was permitted by Tenant of such predecessor or resulted from Tenant's or such predecessor's action or use of the property in question, and (ii) except for the order that is attached hereto as **Exhibit G** (the "**Order**"), Tenant is not subject to any enforcement order issued by any Governmental Authority in connection with the use, storage, handling, treatment, generation, release or disposal of Hazardous Materials (including, without limitation, any order related to the failure to make a required reporting to any Governmental Authority). Tenant hereby represents and warrants that it has fully complied with, and has timely paid all amounts due under, the Order and any related proceedings and that no further action is required or contemplated to be taken thereunder. If Landlord determines that the foregoing representations and warranties were not true as of the date of this lease, Landlord shall have the right to terminate this Lease in Landlord's sole and absolute discretion.

(d)**Testing**. Landlord shall have the right to conduct annual tests of the Premises to determine whether any contamination of the Premises or the Project has occurred as a result of Tenant's use. Tenant shall be required to pay the cost of such annual test of the Premises if there is violation of this Section 30 or if contamination for which Tenant is responsible under this Section 30 is identified; provided, however, that if Tenant conducts its own tests of the Premises using third party contractors and test procedures reasonably acceptable to Landlord which tests are certified to Landlord, Landlord shall accept such tests in lieu of the annual tests. In addition, at any time, and from time to time, prior to the expiration or earlier termination of the Term, Landlord shall have the right to conduct appropriate tests of the Premises and the Project to determine if contamination has occurred as a result of Tenant's use of the Premises. In connection with such testing, upon the request of Landlord, Tenant shall deliver to Landlord or its consultant

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such non-proprietary information concerning the use of Hazardous Materials in or about the Premises by Tenant or any Tenant Party. If contamination has occurred for which Tenant is liable under this Section 30, Tenant shall pay all costs to conduct such tests. If no such contamination is found, Landlord shall pay the costs of such tests (which shall not constitute an Operating Expense). Landlord shall provide Tenant with a copy of all third party, non-confidential reports and tests of the Premises made by or on behalf of Landlord during the Term without representation or warranty and subject to a confidentiality agreement. Tenant shall, at its sole cost and expense, promptly and satisfactorily remediate any environmental conditions identified by such testing for which Tenant or any Tenant Party is responsible under this Lease in accordance with all Environmental Requirements. Landlord's receipt of or satisfaction with any environmental assessment in no way waives any rights which Landlord may have against Tenant.

(e)**Control Areas**. Tenant shall be allowed to utilize up to its pro rata share of the Hazardous Materials inventory within any control area or zone (located within the Premises), as designated by the applicable building code, for chemical use or storage. As used in the preceding sentence, Tenant's pro rata share of any control areas or zones located within the Premises shall be determined based on the rentable square footage that Tenant leases within the applicable control area or zone. For purposes of example only, if a control area or zone contains 10,000 rentable square feet and 2,000 rentable square feet of a tenant's premises are located within such control area or zone (while such premises as a whole contains 5,000 rentable square feet), the applicable tenant's pro rata share of such control area would be 20%.

(f)**Underground Tanks**. Tenant shall have no right to use or install any underground or other storage tanks at the Project.

(g)**Tenant's Obligations**. Tenant's obligations under this Section 30 shall survive the expiration or earlier termination of this Lease. During any period of time after the expiration or earlier termination of this Lease required by Tenant or Landlord to complete the removal from the Premises of any Hazardous Materials for which Tenant is responsible pursuant to this Section 30 (including, without limitation, the release and termination of any licenses or permits restricting the use of the Premises and the completion of the approved Decommissioning and HazMat Closure Plan), Tenant shall continue to pay the full Rent in accordance with this Lease for any portion of the Premises not relet by Landlord in Landlord's reasonable discretion, which Rent shall be prorated daily.

(h)**Definitions**. As used herein, the term "**Environmental Requirements**" means all applicable present and future statutes, regulations, ordinances, rules, codes, judgments, orders or other similar enactments of any Governmental Authority regulating or relating to health, safety, or environmental conditions on, under, or about the Premises or the Project, or the environment, including without limitation, the following: the Comprehensive Environmental Response, Compensation and Liability Act; the Resource Conservation and Recovery Act; and all state and local counterparts thereto, and any regulations or policies promulgated or issued thereunder. As used herein, the term "**Hazardous Materials**" means and includes any substance, material, waste, pollutant, or contaminant listed or defined as hazardous or toxic, or regulated by reason of its impact or potential impact on humans, animals and/or the environment under any Environmental Requirements, asbestos and petroleum, including crude oil or any fraction thereof, natural gas liquids, liquefied natural gas, or synthetic gas usable for fuel (or mixtures of natural gas and such synthetic gas). As defined in Environmental Requirements, Tenant is and shall be deemed to be the "**operator**" of Tenant's "**facility**" and the "**owner**" of all Hazardous Materials brought on the Premises by Tenant or any Tenant Party, and the wastes, by-products, or residues generated, resulting, or produced therefrom.

31.**Tenant's Remedies/Limitation of Liability**. Landlord shall not be in default hereunder unless Landlord fails to perform any of its obligations hereunder within 30 days after written notice from Tenant specifying such failure (unless such performance will, due to the nature of the obligation, require a period of time in excess of 30 days, then after such period of time as is reasonably necessary). Upon any default by Landlord, Tenant shall give notice by registered or certified mail to any Holder of a Mortgage covering the Premises and to any landlord of any lease of property in or on which the Premises are located and Tenant shall offer such Holder and/or landlord a reasonable opportunity to cure the default, including time to obtain possession of the Project by power of sale or a judicial action if such should prove necessary to effect a cure; provided Landlord shall have furnished to Tenant in writing the names and addresses of all such persons who are to receive such notices. All obligations of Landlord hereunder shall be construed as covenants, not conditions; and, except as may be otherwise expressly provided in this Lease, Tenant may not terminate this Lease for breach of Landlord's obligations hereunder.

All obligations of Landlord under this Lease will be binding upon Landlord only during the period of its ownership of the Premises and not thereafter. The term "**Landlord**" in this Lease shall mean only the owner for the time being of the Premises. Upon the transfer by such owner of its interest in the Premises, such owner shall thereupon be released and discharged from all obligations of Landlord thereafter accruing, but such obligations shall be binding during the Term upon each new owner for the duration of such owner's ownership.

32.**Inspection and Access**. Landlord and its agents, representatives, and contractors may enter the Premises at any reasonable time to inspect the Premises and to make such repairs as may be required or permitted pursuant to this Lease and for any other business purpose. Landlord and Landlord's representatives may enter the Premises during business hours on not less than 48 hours advance written notice (except in the case of emergencies in which case no such notice shall be required and such entry may be at any time) for the purpose of effecting any such repairs, inspecting the

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Premises, showing the Premises to prospective purchasers and, during the last 12 months of the Term, to prospective tenants. Landlord shall use reasonable efforts to minimize interference with Tenant's operations in the Premises during any entry into the Premises by Landlord pursuant to this Section 32. Landlord may erect a suitable sign on the Premises stating the Premises are available to let or that the Project is available for sale. Landlord may grant easements, make public dedications, designate Common Areas and create restrictions on or about the Premises, provided that no such easement, dedication, designation or restriction materially, adversely affects Tenant's use or occupancy of the Premises for the Permitted Use. Subject to the immediately preceding sentence, at Landlord's request, Tenant shall execute such commercially reasonable instruments as may be reasonably necessary for such easements, dedications or restrictions. Tenant shall at all times, except in the case of emergencies, have the right to escort Landlord or its agents, representatives, contractors or guests while the same are in the Premises, provided such escort does not materially and adversely affect Landlord's access rights hereunder. Landlord shall use reasonable efforts to comply with Tenant's reasonable security, confidentiality and safety requirements with respect to entering restricted portions of the Premises; provided, however, that Tenant has notified Landlord of such security, confidentiality and safety requirements reasonably prior to Landlord's entry into the Premises and provided further that in no event shall Tenant bar or prohibit access by Landlord or its employees, agents and contractors for the performance of the obligations of Landlord or the exercise of the rights of Landlord under this Lease.

33.**Security**. Tenant acknowledges and agrees that security devices and services, if any, while intended to deter crime may not in given instances prevent theft or other criminal acts and that Landlord is not providing any security services with respect to the Premises. Tenant agrees that Landlord shall not be liable to Tenant for, and Tenant waives any claim against Landlord with respect to, any loss by theft or any other damage suffered or incurred by Tenant in connection with any unauthorized entry into the Premises or any other breach of security with respect to the Premises. Tenant shall be solely responsible for the personal safety of Tenant's officers, employees, agents, contractors, guests and invitees while any such person is in, on or about the Premises and/or the Project. Tenant shall at Tenant's cost obtain insurance coverage to the extent Tenant desires protection against such criminal acts.

Subject to the terms of this Lease, including, without limitation, Tenant's compliance with the Section 12, Tenant, at Tenant's sole cost and expense, shall have the right to install and maintain a Building access control system for the Premises, or security system serving the Premises ("**Tenant's Security System**"), subject to the following conditions: (i) Tenant's plans and specifications for the proposed location of Tenant's Security System and Tenant's protocol for the operation of Tenant's Security System shall be subject to Landlord's prior written approval, which approval will not be unreasonably withheld, conditioned or delayed; provided, however, that Tenant shall coordinate the installation and operation of Tenant's Security System with Landlord to assure that Tenant's Security System may be compatible with the Building's systems and equipment and Tenant does not violate the reasonable privacy rights of any other occupants of the Project; (ii) Landlord shall be provided codes and/or access cards, as applicable, and means of immediate access to fully exercise all of its entry rights under the Lease with respect to the Premises; and (iii) Tenant shall be solely responsible, at Tenant's sole cost and expense, for the monitoring, operation and removal of Tenant's Security System. Upon the expiration or earlier termination of this Lease, unless otherwise approved by Landlord, Tenant shall remove Tenant's Security System. All costs and expenses associated with the removal of Tenant's Security System and the repair of any damage to the Premises and the Building resulting from the installation and/or removal of same shall be borne solely by Tenant.

34.**Force Majeure**. Except for the payment of Rent, neither Landlord nor Tenant shall be responsible or liable for delays in the performance of its obligations hereunder when caused by, related to, or arising out of acts of God, sinkholes or subsidence, strikes, lockouts, or other labor disputes, embargoes, quarantines, weather, national, regional, or local disasters, calamities, or catastrophes, inability to obtain labor or materials (or reasonable substitutes therefor) at reasonable costs or failure of, or inability to obtain, utilities necessary for performance, governmental restrictions, orders, limitations, regulations, or controls, national emergencies, delay in issuance or revocation of permits, enemy or

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hostile governmental action, terrorism, insurrection, riots, civil disturbance or commotion, fire or other casualty, local, regional or national pandemic or epidemic, and other causes or events beyond their reasonable control ("**Force Majeure**").

35.**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 this transaction and that no Broker brought about this transaction, other than Jones Lang LaSalle and Newmark Knight Frank. Landlord and Tenant each hereby agree to indemnify and hold the other harmless from and against any claims by any Broker, other than Jones Lang LaSalle and Newmark Knight Frank, claiming a commission or other form of compensation by virtue of having dealt with Tenant or Landlord, as applicable, with regard to this leasing transaction. Landlord shall be responsible for all commissions due to Newmark Knight Frank and Jones

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Lang LaSalle arising out of the execution of this Lease in accordance with the terms of a separate written agreement between Jones Lang LaSalle and Newmark Knight Frank, on the one hand, and Landlord, on the other hand.

36.**Limitation on Landlord's Liability**. NOTWITHSTANDING ANYTHING SET FORTH HEREIN OR IN ANY OTHER AGREEMENT BETWEEN LANDLORD AND TENANT TO THE CONTRARY: (A) LANDLORD SHALL NOT BE LIABLE TO TENANT OR ANY OTHER PERSON FOR (AND TENANT AND EACH SUCH OTHER PERSON ASSUME ALL RISK OF) LOSS, DAMAGE OR INJURY, WHETHER ACTUAL OR CONSEQUENTIAL TO: TENANT'S PERSONAL PROPERTY OF EVERY KIND AND DESCRIPTION, INCLUDING, WITHOUT LIMITATION TRADE FIXTURES, EQUIPMENT, INVENTORY, SCIENTIFIC RESEARCH, SCIENTIFIC EXPERIMENTS, LABORATORY ANIMALS, PRODUCT, SPECIMENS, SAMPLES, AND/OR SCIENTIFIC, BUSINESS, ACCOUNTING AND OTHER RECORDS OF EVERY KIND AND DESCRIPTION KEPT AT THE PREMISES AND ANY AND ALL INCOME DERIVED OR DERIVABLE THEREFROM; (B) THERE SHALL BE NO PERSONAL RECOURSE TO LANDLORD FOR ANY ACT OR OCCURRENCE IN, ON OR ABOUT THE PREMISES OR ARISING IN ANY WAY UNDER THIS LEASE OR ANY OTHER AGREEMENT BETWEEN LANDLORD AND TENANT WITH RESPECT TO THE SUBJECT MATTER HEREOF AND ANY LIABILITY OF LANDLORD HEREUNDER SHALL BE STRICTLY LIMITED SOLELY TO LANDLORD'S INTEREST IN THE PROJECT OR ANY PROCEEDS FROM SALE OR CONDEMNATION THEREOF AND ANY INSURANCE PROCEEDS PAYABLE IN RESPECT OF LANDLORD'S INTEREST IN THE PROJECT OR IN CONNECTION WITH ANY SUCH LOSS; AND (C) IN NO EVENT SHALL ANY PERSONAL LIABILITY BE ASSERTED AGAINST LANDLORD IN CONNECTION WITH THIS LEASE NOR SHALL ANY RECOURSE BE HAD TO ANY OTHER PROPERTY OR ASSETS OF LANDLORD OR ANY OF LANDLORD'S OFFICERS, DIRECTORS, EMPLOYEES, AGENTS OR CONTRACTORS. UNDER NO CIRCUMSTANCES SHALL LANDLORD OR ANY OF LANDLORD'S OFFICERS, DIRECTORS, EMPLOYEES, AGENTS OR CONTRACTORS BE LIABLE FOR INJURY TO TENANT'S BUSINESS OR FOR ANY LOSS OF INCOME OR PROFIT THEREFROM.

37.**Severability**. If any clause or provision of this Lease is illegal, invalid or unenforceable under present or future laws, then and in that event, it is the intention of the parties hereto that the remainder of this Lease shall not be affected thereby. It is also the intention of the parties to this Lease that in lieu of each clause or provision of this Lease that is illegal, invalid or unenforceable, there be added, as a part of this Lease, a clause or provision as similar in effect to such illegal, invalid or unenforceable clause or provision as shall be legal, valid and enforceable.

38.**Signs; Exterior Appearance**. Tenant shall not, without the prior written consent of Landlord, which may be granted or withheld in Landlord's reasonable discretion: (i) attach any awnings, exterior lights, decorations, balloons, flags, pennants, banners, painting or other projection to any outside wall of the Project, (ii) use any curtains, blinds, shades or screens other than Landlord's standard window coverings, (iii) coat or otherwise sunscreen the interior or exterior of any windows, (iv) place any bottles, parcels, or other articles on the window sills, (v) place any equipment, furniture or other items of personal property on any exterior balcony, or (vi) paint, affix or exhibit on any part of the Premises or the Project any signs, notices, window or door lettering, placards, decorations, or advertising media of any type which

can be viewed from the exterior of the Premises. Suite entry signage, and the inclusion of Tenant's name and suite numbers on the Building lobby directory and Tenant's name on directional signage at the Project (in locations reasonably determined by Landlord) shall be inscribed, painted or affixed for Tenant by

Landlord at the sole cost and expense of Landlord, and shall be of a size, color and type reasonably acceptable to Landlord. Nothing may be placed on the exterior of corridor walls or corridor doors other than Landlord's standard lettering. The directory tablet shall be provided exclusively for the display of the name and location of tenants.

39.**Right to Expand**.

(a)**Expansion in the Building**. Subject to the terms of this Section 39(a), Tenant shall have the [***] right during the Base Term, but not the obligation, to expand the Premises (the "**Expansion Right**") to include the Expansion Space upon the terms and conditions in this Section 39. For purposes of this Section 39(a), "**Expansion Space**" shall mean [***]. If [***] the Expansion Space becomes available, Landlord shall deliver to Tenant written notice (the "**Expansion Notice**") of the availability of such Expansion Space, together with [***]. For the avoidance of doubt, Tenant may only exercise its rights under this Section 39(a) with respect to all of the space (as opposed to only part of the space) described in the Expansion Notice ("**Identified Expansion Space**"). The term of this Lease with respect to the Identified Expansion Space [***]. Tenant shall have [***] following receipt of the Expansion Notice to deliver to Landlord written notification of Tenant's exercise of the Expansion Right ("**Exercise Notice**") with respect to the Identified Expansion Space. If Tenant does not deliver an Exercise Notice to Landlord within such [***] period, then Tenant shall be deemed to have waived its rights under this Section 39(a) with respect to the Identified Expansion Space, and Landlord shall have the right to lease the Identified Expansion Space to any third party on any terms and conditions acceptable to Landlord. Notwithstanding anything to the contrary contained in this Section 39(a), if Tenant does not exercise its Expansion Right with respect to the Identified Expansion Space and Landlord intends to lease the Expansion Space to a third party for [***] less than [***] of the rental rate set forth in the Expansion Notice, as reasonably determined by Landlord, then Tenant's Right of First Offer with respect to the Identified Expansion Space shall be restored.

(b)**Amended Lease**. If: (i) Tenant fails to timely deliver the Exercise Notice, or (ii) after the expiration of a period of 30 days after Landlord's delivery to Tenant of a lease amendment for Tenant's lease of the Identified Space, no lease amendment for the Identified Space acceptable to both parties each in their reasonable discretion after using diligent good faith efforts negotiate the same, has been executed, Tenant shall, notwithstanding anything to the contrary contained herein, be deemed to have forever waived its right to lease such Identified Space.

(c)**Exceptions**. Notwithstanding the above, the Expansion Right shall, at Landlord's option, not be in effect and may not be exercised by Tenant:

(i)during any period of time that Tenant is in Default under any provision of this Lease; or

(ii)if Tenant has been in Default under any provision of this Lease 3 or more times, whether or not the Defaults are cured, during the 12 month period prior to the date on which Tenant seeks to exercise the Expansion Right.

(d)**Termination**. The Expansion Right shall, at Landlord's option, terminate and be of no further force or effect even after Tenant's due and timely exercise of the Expansion Right, if, after such exercise, but prior to the commencement date of the lease of such Expansion Space, (i) Tenant fails to cure any default by Tenant under this Lease within the applicable notice and cure period; or (ii) Tenant has Defaulted 3 or more times during the period from the date of the exercise of the Expansion Right to the date of the commencement of the lease of the Expansion Space, whether or not such Defaults are cured.

(e)**Rights Personal**. Expansion Rights are personal to Tenant and are not assignable without Landlord's consent, which may be granted or withheld in Landlord's sole discretion separate and apart from any consent by Landlord to an assignment of Tenant's interest in this Lease, except that they may be assigned in connection with any Permitted Assignment of this Lease.

(f)**No Extensions**. The period of time within which any Expansion Rights may be exercised shall not be extended or enlarged by reason of Tenant's inability to exercise the Expansion Rights.

40.**Right to Extend Term**. Tenant shall have the right to extend the Term of this Lease upon the following terms and conditions:

(a)**Extension Right**. Tenant shall have 1 right (the "**Extension Right**") to extend the term of this Lease for 5 years (the "**Extension Term**") on the same terms and conditions as this Lease (other than with respect to Base Rent and the Work Letter) by giving Landlord written notice of its election to exercise the Extension Right at least 10 months prior to the expiration of the Base Term of this Lease.

Upon the commencement of the Extension Term, Base Rent shall be payable at the Market Rate (as defined below). Base Rent shall thereafter be adjusted on each annual anniversary of the commencement of the Extension Term agreed upon by Landlord and agreed to by Tenant at the time the Market Rate is determined. As used herein, "**Market Rate**" shall mean the rate that comparable landlords of comparable buildings have accepted in current transactions from non-equity (i.e., not being offered equity in the buildings) and nonaffiliated tenants of similar financial strength for space of comparable size, quality (including all Tenant Improvements, Common Area Amenities, Alterations and other improvements) and floor height in Class A laboratory/office buildings in the vicinity of the Project for a comparable term, with the determination of the Market Rate to take into account all relevant factors, including tenant inducements, views, parking costs, leasing commissions, allowances or concessions, if any.

If, on or before the date which is 180 days prior to the expiration of the Base Term of this Lease, Tenant has not agreed with Landlord's determination of the Market Rate and the rent escalations during the Extension Term after negotiating in good faith, Tenant shall be deemed to have elected arbitration as described in Section 40(b). Tenant acknowledges and agrees that, if Tenant has elected to exercise the Extension Right by delivering notice to Landlord as required in this Section 40(a), Tenant shall have no right thereafter to rescind or elect not to extend the term of this Lease for the Extension Term.

(b)**Arbitration**.

(i)Within 10 days of Tenant's notice to Landlord of its election (or deemed election) to arbitrate Market Rate and escalations, each party shall deliver to the other a proposal containing the Market Rate and escalations that the submitting party believes to be correct ("**Extension Proposal**"). If either party fails to timely submit an Extension Proposal, the other party's submitted proposal shall determine the Base Rent and escalations for the Extension Term. If both parties submit Extension Proposals, then Landlord and Tenant shall meet within 7 days after delivery of the last Extension Proposal and make a good faith attempt to mutually appoint a single Arbitrator (and defined below) to determine the Market Rate and escalations. If Landlord and Tenant are unable to agree upon a single Arbitrator, then each shall, by written notice delivered to the other within 10 days after the meeting, select an Arbitrator. If either party fails to timely give notice of its selection for an Arbitrator, the other party's submitted proposal shall determine the Base Rent for the Extension Term. The 2 Arbitrators so appointed shall, within 5 business days after their appointment, appoint a third Arbitrator. If the 2 Arbitrators so selected cannot agree on the selection of the third Arbitrator within the time above specified, then either party, on behalf of both parties, may request such appointment of such third Arbitrator by application to any state court of general jurisdiction in the jurisdiction in which the Premises are located, upon 10 days prior written notice to the other party of such intent.

(ii)The decision of the Arbitrator(s) shall be made within 30 days after the appointment of a single Arbitrator or the third Arbitrator, as applicable. The decision of the single Arbitrator shall be final and binding upon the parties. The average of the two closest Arbitrators in a three Arbitrator panel shall be final and binding upon the parties. Each party shall pay the fees and expenses of the Arbitrator appointed by or on behalf of such party and the fees and expenses of the third Arbitrator shall be borne equally by both parties. If the Market Rate and escalations are not determined by the first day of the Extension Term, then Tenant shall pay Landlord Base Rent in an amount equal to the Base Rent in effect immediately prior to the Extension Term and increased by the Rent Adjustment Percentage until such determination is made. After the determination of the Market Rate and escalations, the parties shall make any necessary adjustments to such payments made by Tenant. Landlord and Tenant shall then execute an amendment recognizing the Market Rate and escalations for the Extension Term.

(iii)An "**Arbitrator**" shall be any person appointed by or on behalf of either party or appointed pursuant to the provisions hereof and: (i) shall be (A) a member of the American Institute of Real Estate Appraisers with not less than 10 years of experience in the appraisal of improved office and high tech industrial real estate in the San Francisco peninsula area, or (B) a licensed commercial real estate broker with not less than 15 years' experience representing landlords and/or tenants in the leasing of high tech or life sciences space in the San Francisco peninsula area, (ii) devoting substantially all of their time to professional appraisal or brokerage work, as applicable, at the time of appointment and (iii) be in all respects impartial and disinterested.

(c)**Rights Personal**. The Extension Right is personal to Tenant and is not assignable without Landlord's consent, which may be granted or withheld in Landlord's sole discretion separate and apart from any consent by Landlord to an assignment of Tenant's interest in this Lease, except that it may be assigned in connection with any Permitted Assignment of this Lease.

(d)**Exceptions**. Notwithstanding anything set forth above to the contrary, the Extension Right shall, at Landlord's option, not be in effect and Tenant may not exercise the Extension Right:

(i)during any period of time that Tenant is in Default under any provision of this Lease; or

(ii)if Tenant has been in Default under any provision of this Lease 3 or more times, whether or not the Defaults are cured, during the 12 month period immediately prior to the date that Tenant intends to exercise the Extension Right, whether or not the Defaults are cured.

(e)**No Extensions**. The period of time within which the Extension Right may be exercised shall not be extended or enlarged by reason of Tenant's inability to exercise the Extension Right.

(f)**Termination**. The Extension Right shall, at Landlord's option, terminate and be of no further force or effect even after Tenant's due and timely exercise of the Extension Right, if, after such exercise, but prior to the commencement date of the Extension Term, (i) Tenant fails to cure any default by Tenant under this Lease within the applicable notice and cure period; or (ii) Tenant has Defaulted 3 or more times during the period from the date of the exercise of the Extension Right to the date of the commencement of the Extension Term, whether or not such Defaults are cured.

41.**Miscellaneous**.

(a)**Notices**. All notices or other communications between the parties shall be in writing and shall be deemed duly given upon delivery or refusal to accept delivery by the addressee thereof if delivered in person, or upon actual receipt if delivered by reputable overnight guaranty courier, addressed and sent to the parties at their addresses set forth above. Landlord and Tenant may from time to time by written notice to the other designate another address for receipt of future notices.

(b)**Joint and Several Liability**. If and when included within the term "**Tenant**," as used in this instrument, there is more than one person or entity, each shall be jointly and severally liable for the obligations of Tenant.

(c)**Financial Information**. Tenant shall furnish Landlord with true and complete copies of (i) upon Landlord's written request, Tenant's most recent audited annual and/or quarterly financial statements, (ii) upon Landlord's written request from time to time, updated business plans, including cash flow projections and/or pro forma balance sheets and income statements, and (iii) upon Landlord's written request from time to time, any other financial information or summaries that Tenant typically provides to its lenders or shareholders, all of which financial statements and information shall be treated by Landlord as confidential information belonging to Tenant. In no event shall Tenant be required to provide any of the foregoing more than one time in any calendar year. Notwithstanding anything to the contrary contained in this Lease, Landlord's written request for financial information pursuant to this Section 41(c) may delivered to Tenant via email. So long as Tenant is a "public company" and its financial information is publicly available, then this Section 41(c) and the delivery requirements herein shall not apply.

(d)**Recordation**. Neither this Lease nor a memorandum of lease shall be filed by or on behalf of Tenant in any public record. Landlord may prepare and file, and upon request by Landlord Tenant will execute, a memorandum of lease. Nothing contained in this Lease is intended to prohibit Tenant from filing this Lease with the Securities and Exchange Commission ("**SEC**") to the extent that Tenant is required to do so pursuant to applicable SEC requirements.

(e)**Interpretation**. The normal rule of construction to the effect that any ambiguities are to be resolved against the drafting party shall not be employed in the interpretation of this Lease or any exhibits or amendments hereto. Words of any gender used in this Lease shall be held and construed to include any other gender, and words in the singular number shall be held to include the plural, unless the context otherwise requires. The captions inserted in this Lease are for convenience only and in no way define, limit or otherwise describe the scope or intent of this Lease, or any provision hereof, or in any way affect the interpretation of this Lease.

(f)**Not Binding Until Executed**. The submission by Landlord to Tenant of this Lease shall have no binding force or effect, shall not constitute an option for the leasing of the Premises, nor confer any right or impose any obligations upon either party until execution of this Lease by both parties.

(g)**Limitations on Interest**. It is expressly the intent of Landlord and Tenant at all times to comply with applicable law governing the maximum rate or amount of any interest payable on or in connection with this Lease. If applicable law is ever judicially interpreted so as to render usurious any interest called for under this Lease, or contracted for, charged, taken, reserved, or received with respect to this Lease, then it is Landlord's and Tenant's express intent that all excess amounts theretofore collected by Landlord be credited on the applicable obligation (or, if the obligation has been or would thereby be paid in full, refunded to Tenant), and the provisions of this Lease immediately shall be deemed reformed and the amounts

thereafter collectible hereunder reduced, without the necessity of the execution of any new document, so as to comply with the applicable law, but so as to permit the recovery of the fullest amount otherwise called for hereunder.

(h)**Choice of Law**. Construction and interpretation of this Lease shall be governed by the internal laws of the state in which the Premises are located, excluding any principles of conflicts of laws.

(i)**Time**. Time is of the essence as to the performance of Tenant's obligations under this Lease.

(j)**OFAC**. Tenant is currently (a) in compliance with and shall at all times during the Term of this 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

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(collectively, the "**OFAC Rules**"), (b) not listed on, and shall not during the term of this Lease be listed on, the Specially Designated Nationals and Blocked Persons List, Foreign Sanctions Evaders List, or the Sectoral Sanctions Identification 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.

(k)**Incorporation by Reference**. All exhibits and addenda attached hereto are hereby incorporated into this Lease and made a part hereof. If there is any conflict between such exhibits or addenda and the terms of this Lease, such exhibits or addenda shall control.

(l)**Entire Agreement**. This Lease, including the exhibits attached hereto, constitutes the entire agreement between Landlord and Tenant pertaining to the subject matter hereof and supersedes all prior and contemporaneous agreements, understandings, letters of intent, negotiations and discussions, whether oral or written, of the parties, and there are no warranties, representations or other agreements, express or implied, made to either party by the other party in connection with the subject matter hereof except as specifically set forth herein.

(m)**No Accord and Satisfaction**. No payment by Tenant or receipt by Landlord of a lesser amount than the monthly installment of Base Rent or any Additional Rent will be other than on account of the earliest stipulated Base Rent and Additional Rent, nor will any endorsement or statement on any check or letter accompanying a check for payment of any Base Rent or Additional Rent be an accord and satisfaction. Landlord may accept such check or payment without prejudice to Landlord's right to recover the balance of such Rent or to pursue any other remedy provided in this Lease.

(n)**Hazardous Activities**. Notwithstanding any other provision of this Lease, Landlord, for itself and its employees, agents and contractors, reserves the right to refuse to perform any repairs or services in any portion of the Premises which, pursuant to Tenant's routine safety guidelines, practices or custom or prudent industry practices, require any form of protective clothing or equipment other than safety glasses. In any such case, Tenant shall contract with parties who are acceptable to Landlord, in Landlord's reasonable discretion, for all such repairs and services, and Landlord shall, to the extent required, equitably adjust Tenant's Share of Operating Expenses in respect of such repairs or services to reflect that Landlord is not providing such repairs or services to Tenant.

(o)**EV Charging Stations**. Landlord shall not unreasonably withhold its consent to Tenant's written request to install 1 or more electric vehicle car charging stations ("**EV Stations**") in the parking area serving the Project for Tenant's exclusive use; provided, however, that Tenant complies with all reasonable requirements, standards, rules and regulations which may be imposed by Landlord, at the time Landlord's consent is granted, in connection with Tenant's installation, maintenance, repair and operation of such EV Stations, which may include, without limitation, the charge to Tenant of a reasonable monthly rental amount for the parking spaces used by Tenant for such EV Stations, Landlord's designation of the location of Tenant's EV Stations, and Tenant's payment of all costs whether incurred by Landlord or Tenant in connection with the installation, maintenance, repair and operation of each Tenant's EV Station(s). Nothing contained in this paragraph is intended to increase the number of parking spaces which Tenant is otherwise entitled to use at the Project under Section 10 of this Lease nor impose any additional obligations on Landlord with respect to Tenant's parking rights at the Project. Tenant shall have the right to use, on a non-exclusive, non-reserved basis, all unreserved EV Stations made available by Landlord to the occupants of the Project.

(p)**California Accessibility Disclosure**. For purposes of Section 1938(a) of the California Civil Code, Landlord hereby discloses to Tenant, and Tenant hereby acknowledges, that the Project has not undergone inspection by a Certified Access Specialist (CASp). In addition, the following notice is hereby provided pursuant to Section 1938(e) of the California Civil Code: "A Certified Access Specialist (CASp) can inspect the subject premises and determine whether the subject premises comply with all of

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the applicable construction-related accessibility standards under state law. Although state law does not require a CASp inspection of the subject premises, the commercial property owner or lessor may not prohibit the lessee or tenant from obtaining a CASp inspection of the subject premises for the occupancy or potential occupancy of the lessee or tenant, if requested by the lessee or tenant. The parties shall mutually agree on the arrangements for the time and manner of the CASp inspection, the payment of the fee for the CASp inspection, and the cost of making any repairs necessary to correct violations of construction-related accessibility standards within the premises." In furtherance of and in connection with such notice: (i) Tenant, having read such notice and understanding Tenant's right to request and obtain a CASp inspection, hereby elects not to obtain such CASp inspection and forever waives its rights to obtain a CASp inspection with respect to the Premises, Building and/or Project to the extent permitted by Legal Requirements; and (ii) if the waiver set forth in clause (i) hereinabove is not enforceable pursuant to Legal Requirements, then Landlord and Tenant hereby agree as follows (which constitutes the mutual agreement of the parties as to the matters described in the last sentence of the foregoing notice): (A) Tenant shall have the one-time right to request for and obtain a CASp inspection, which request must be made, if at all, in a written notice delivered by Tenant to Landlord; (B) any CASp inspection timely requested by Tenant shall be conducted (1) at a time mutually agreed to by Landlord and Tenant, (2) in a professional manner by a CASp designated by Landlord and without any testing that would damage the Premises, Building or Project in any way, and (3) at Tenant's sole cost and expense, including, without limitation, Tenant's payment of the fee for such CASp inspection, the fee for any reports prepared by the CASp in connection with such CASp inspection (collectively, the "**CASp Reports**") and all other costs and expenses in connection therewith; (C) the CASp Reports shall be delivered by the CASp simultaneously to Landlord and Tenant; (D) Tenant, at its sole cost and expense, shall be responsible for making any improvements, alterations, modifications and/or repairs to or within the Premises to correct violations of construction-related accessibility standards including, without limitation, any violations disclosed by such CASp inspection; and (E) if such CASp inspection identifies any improvements, alterations, modifications and/or repairs necessary to correct violations of construction-related accessibility standards relating to those items of the

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Building and Project located outside the Premises that are Landlord's obligation to repair as set forth in this Lease, then Landlord shall perform such improvements, alterations, modifications and/or repairs as and to the extent required by Legal Requirements to correct such violations, and Tenant shall reimburse Landlord for the cost of such improvements, alterations, modifications and/or repairs within 30 days after Tenant's receipt of an invoice therefor from Landlord. Landlord and Tenant expressly acknowledge and agree that the foregoing provisions of this Section 41(p) shall apply only in the event that Tenant elects to obtain a CASp inspection. In the event that Tenant does not elect to obtain a CASp inspection, the terms and provisions of this Section 41(p) regarding the allocation of costs for Alterations and improvements shall not be applicable.

(q)**Counterparts**. This Lease 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 Lease and all matters related thereto, with such electronic signatures having the same legal effect as original signatures.

(r)**Approvals**. Whenever this Lease requires an approval, consent, determination, selection or judgment by either Landlord or Tenant, unless another standard is expressly set forth herein, such approval, consent, determination, selection or judgment shall not be unreasonably withheld, conditioned or delayed.

[Signatures on next page]

IN WITNESS WHEREOF, Landlord and Tenant have executed this Lease as of the day and year first above written.

TENANT:

CODEXIS, INC.,
a Delaware corporation

By: /s/ John Nicols
Its: President and Chief Executive Officer

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, RE Legal Affairs

EXHIBIT A TO LEASE

DESCRIPTION OF PREMISES

Intentionally omitted pursuant to Regulation S-K, Item 601(a)(5)

EXHIBIT B TO LEASE

DESCRIPTION OF PROJECT

Intentionally omitted pursuant to Regulation S-K, Item 601(a)(5)

EXHIBIT C TO LEASE

WORK LETTER

THIS WORK LETTER (this "**Work Letter**") is incorporated into that certain Lease Agreement (the "**Lease**") dated as of January 29, 2021 by and between **ARE-SAN FRANCISCO NO. 63, LLC**, a Delaware limited liability company ("**Landlord**"), and **CODEXIS, INC.**, a Delaware corporation ("**Tenant**"), and is attached to and made a part of that certain Lease Agreement dated January 29, 2021, by and between Landlord and Tenant. Any initially capitalized terms used but not defined herein shall have the meanings given them in the Lease.

1.**General Requirements**.

i.**Tenant's Authorized Representative**. Tenant designates [***] and [***] (any such individual acting alone, "**Tenant's Representative**") as the only person authorized to act for Tenant pursuant to this Work Letter. Landlord shall not be obligated to respond to or act upon any request, approval, inquiry or other communication ("**Communication**") from or on behalf of Tenant in connection with this Work Letter unless such Communication is in writing from Tenant's Representative. Tenant may change either Tenant's Representative at any time upon not less than 5 business days advance written notice to Landlord. Neither Tenant nor Tenant's Representative shall be authorized to direct Landlord's contractors in the performance of Landlord's Work (as hereinafter defined).

ii.**Landlord's Authorized Representative**. Landlord designates [***], [***] and [***] (any such individual acting alone, "**Landlord's Representative**") as the only persons authorized to act for Landlord pursuant to this Work Letter. Tenant shall not be obligated to respond to or act upon any request, approval, inquiry or other Communication from or on behalf of Landlord in connection with this Work Letter unless such Communication is in writing from Landlord's Representative. Landlord may change either Landlord's Representative at any time upon not less than 5 business days advance written notice to Tenant. Landlord's Representative shall be the sole persons authorized to direct Landlord's contractors in the performance of Landlord's Work.

iii.**Architects, Consultants and Contractors**. Landlord and Tenant hereby acknowledge and agree that: (i) Truebeck Construction shall be the general contractor for the Tenant Improvements (the "**General Contractor**"), (ii) the architect for the Tenant Improvements shall be DGA (the "**TI Architect**"), and (iii) any subcontractors for the Tenant Improvements shall be selected by Landlord, subject to Tenant's approval, which approval shall not be unreasonably withheld, conditioned or delayed. The General Contractor shall obtain at least 3 bids from subcontractors for the work of the major trades with respect to the Tenant Improvements. The contracts for the General Contractor and subcontractors shall be engaged by Landlord, with fees, general conditions and warranties consistent with market standards. Landlord has provided to Tenant a copy of the general conditions from Landlord's contract with the General Contractor and the fee for the General Contractor shall be as set forth in the Initial Budget.

a.**Tenant Improvements**.

i.**Tenant Improvements Defined**. As used herein, "**Tenant Improvements**" shall mean all improvements to the Premises of a fixed and permanent nature as shown on the TI Construction Drawings, as defined in Section 2(c) below. Other than Landlord's Work (as defined in Section 3(a)) below, Landlord shall not have any obligation whatsoever with respect to the finishing of the Premises for Tenant's use and occupancy. The contemplated schedule for the Tenant Improvements is attached hereto as **Schedule 3** (the "**Schedule**").

ii.**Tenant's Space Plans**. Landlord and Tenant acknowledge and agree that the plan prepared by the TI Architect attached hereto as **Schedule 1** (the "**Space Plans**") has been approved by both Landlord and Tenant. Landlord and Tenant further acknowledge and agree that any changes to the Space Plans

requested by Tenant constitute a Change Request the cost of which changes shall be paid for by Tenant. Tenant shall be solely responsible for all costs incurred by Landlord to alter the Building (or Landlord's plans for the Building) as a result of Tenant's requested changes.

iii.**Working Drawings**. Landlord shall cause the TI Architect to prepare and deliver to Tenant for review and comment construction plans, specifications and drawings for the Tenant Improvements ("**TI Construction Drawings**"), which TI Construction Drawings shall be prepared substantially in accordance with the Space Plans. Tenant shall be solely responsible for ensuring that the TI Construction Drawings reflect Tenant's requirements for the Tenant Improvements. Tenant shall deliver its written comments on the TI Construction Drawings to Landlord not later than 10 business days after Tenant's receipt of the same; provided, however, that Tenant may not disapprove any matter that is consistent with the Space Plans without submitting a Change Request. Landlord and the TI Architect shall consider all such comments in good faith and shall, within 10 business days after receipt, notify Tenant how Landlord proposes to respond to such comments, but Tenant's review rights pursuant to the foregoing sentence shall not delay the design or construction schedule for the Tenant Improvements. Any disputes in connection with such comments shall be resolved in accordance with Section 2(d) hereof. Provided that the design reflected in the TI Construction Drawings is consistent with the Space Plans, Tenant shall approve the TI Construction Drawings submitted by Landlord, unless Tenant submits a Change Request. Once approved by Tenant, subject to the provisions of Section 4 below, Landlord shall not materially modify the TI Construction Drawings except as may be reasonably required in connection with the issuance of the TI Permit (as defined in Section 3(b) below).

iv.**Approval and Completion**. It is hereby acknowledged by Landlord and Tenant that the TI Construction Drawings must be completed and approved not later than March 17, 2021, in order for the Tenant Improvements to be Substantially Complete by the Target Commencement Date (as defined in the Lease). Upon any dispute regarding the design of the Tenant Improvements, which is not settled within 10 business days after notice of such dispute is delivered by one party to the other, Tenant may make the final decision regarding the design of the Tenant Improvements, provided (i) Tenant acts reasonably and such final decision is either consistent with or a compromise between Landlord's and Tenant's positions with respect to such dispute, (ii) that all costs and expenses resulting from any such decision by Tenant shall be payable out of the TI Fund (as defined in Section 5(d) below), and (iii) Tenant's decision will not affect the base Building, structural components of the Building or any Building Systems (in which case Landlord shall make the final decision). Any changes to the TI Construction Drawings following Landlord's and Tenant's approval of same requested by Tenant shall be processed as provided in Section 4 hereof.

b.**Performance of Landlord's Work**.

i.**Definition of Landlord's Work**. As used herein, "**Landlord's Work**" shall mean the work of constructing the Tenant Improvements. In addition to Landlord's Work, Landlord shall be responsible, at Landlord's cost, for the substantial completion, in accordance with applicable Legal Requirements and in a good and workmanlike manner, of the building shell and related site improvements consisting of the elements described on the Basis of Design attached hereto as **Schedule 2** under the categories of "Cold Shell" and "Full Shell Warm Up" and related site improvements marked with an "X".

Tenant shall be solely responsible for ensuring that the design and specifications for the Tenant Improvements are consistent with Tenant's requirements. Landlord shall be responsible for obtaining all permits, approvals and entitlements necessary in connection with the performance and Substantial Completion of Landlord's Work, but shall have no obligation to, and shall not, secure any permits, approvals or entitlements related to Tenant's use of the Premises or Tenant's business operations therein.

ii.**Commencement and Permitting**. Landlord shall commence construction of the Tenant Improvements upon obtaining a building permit (the "**TI Permit**") authorizing the construction of the Tenant Improvements consistent with the TI Construction Drawings approved by Tenant. The cost of

obtaining the TI Permit shall be payable from the TI Fund. Tenant shall assist Landlord in obtaining the TI Permit. If any Governmental Authority having jurisdiction over the construction of Landlord's Work or any portion thereof shall impose terms or conditions upon the construction thereof that: (i) are inconsistent with Landlord's obligations hereunder, (ii) increase the cost of constructing Landlord's Work, or (iii) will materially delay the construction of Landlord's Work, Landlord and Tenant shall reasonably and in good faith seek means by which to mitigate or eliminate any such adverse terms and conditions.

iii.**Completion of the Tenant Improvements**. Landlord shall substantially complete or cause to be substantially completed the Tenant Improvements in a good and workmanlike manner, in compliance with Legal Requirements, the TI Construction Drawings and the TI Permit subject, in each case, to Minor Variations and normal "punch list" items of a non-material nature that do not interfere with the use of the Premises and with a certificate or temporary certificate of occupancy (or an equivalent approval having been issued) for the Premises permitting lawful occupancy of the Premises (but specifically excluding any permits, licenses or other governmental approvals required to be obtained in connection with Tenant's operations in the Premises) ("**Substantial Completion**" or "**Substantially Complete**"). Upon Substantial Completion of the Tenant Improvements, Landlord shall require the TI Architect and the General Contractor to execute and deliver, for the benefit of Tenant and Landlord, a Certificate of Substantial Completion in the form of the American Institute of Architects ("**AIA**") document G704. For purposes of this Work Letter, "**Minor Variations**" shall mean any non-material modifications reasonably required: (i) to comply with all applicable Legal Requirements and/or to obtain or to comply with any required permit (including the TI Permit); (ii) to comply with any request by Tenant for modifications to the Tenant Improvements; (iii) to comport with good design, engineering, and construction practices that are not material; or (iv) to make reasonable adjustments for field deviations or conditions encountered during the construction of the Tenant Improvements. Landlord shall promptly undertake and complete, or cause to be completed, all punch list items. Tenant shall have no obligation to restore the Tenant Improvements at the expiration of the Term.

iv.**Selection of Materials**. Where more than one type of material or structure is indicated on the TI Construction Drawings approved by Landlord and Tenant, the option will be selected at Landlord's reasonable discretion. As to all building materials and equipment that Landlord is obligated to supply under this Work Letter, Landlord shall select the manufacturer thereof in its sole and absolute discretion.

v.**Delivery of the Premises**. When the Tenant Improvements are Substantially Complete, subject to the remaining terms and provisions of this Section 3(e), Tenant shall accept the Premises. Tenant's taking possession and acceptance of the Premises shall not constitute a waiver of: (i) any warranty with respect to workmanship (including installation of equipment) or material (exclusive of equipment provided directly by manufacturers), (ii) any non-compliance of the Tenant Improvements with applicable Legal Requirements, or (iii) any claim that the Tenant Improvements were not completed substantially in accordance with the TI Construction Drawings (subject to Minor Variations and such other changes as are permitted hereunder) (collectively, a "**Construction Defect**"). Tenant shall have one year after Substantial Completion within which to notify Landlord of any such Construction Defect discovered by Tenant, and Landlord shall use reasonable efforts to remedy or cause the responsible contractor to remedy any such Construction Defect within 30 days thereafter, at no expense to Tenant. Notwithstanding the foregoing, Landlord shall not be in default under the Lease if the applicable contractor, despite Landlord's reasonable

efforts, fails to remedy such Construction Defect within such 30-day period. If the contractor fails to remedy such Construction Defect within a reasonable time, Landlord shall use reasonable efforts to remedy the Construction Defect within a reasonable period.

Tenant shall be entitled to receive the benefit of all construction warranties and manufacturer's equipment warranties relating to equipment installed in the Premises. If requested by Tenant, Landlord shall attempt to obtain extended warranties from manufacturers and suppliers of such equipment, but the cost of any such extended warranties shall be borne solely out of the TI Fund.

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vi.**Commencement Date Delay**. Except as otherwise provided in the Lease, Delivery of the Premises shall occur when the Tenant Improvements have been Substantially Completed, except to the extent that completion of the Tenant Improvements shall have been actually delayed by any one or more of the following causes ("**Tenant Delay**"):

1.Tenant's Representative was not available within the time period set forth in this Work Letter (or, if no time period is set forth in this Work Letter, then within 2 business days) to give or receive any Communication or to take any other action required to be taken by Tenant hereunder;

2.Tenant's request for Change Requests (as defined in Section 4(a) below) whether or not any such Change Requests are actually performed;

3.Construction of any Change Requests;

4.Tenant's request for materials, finishes or installations are not consistent with Building standard materials, finishes or installations and require unusually long lead times, provided that promptly after Landlord learns of such long lead times, Landlord informs Tenant that the requested items will require unusually long lead times;

5.Tenant's delay in reviewing, revising or approving plans and specifications beyond the periods set forth herein;

6.Tenant's delay in providing information critical to the normal progression of the Project. Tenant shall provide such information as soon as reasonably possible, but in no event longer than one week after receipt of any request for such information from Landlord;

7.Tenant's delay in making payments to Landlord for any Excess TI Costs (as defined in Section 5(d) below) with respect to which Landlord has delivered an invoice to Tenant pursuant to Section 5(d) below;

8.Tenant's delay in the approval of the Initial Budget or any amendment thereto that results in the process for review and approval of such Initial Budget or any particular amendment, as applicable, extending for a period in excess of 3 business days after delivery of such Initial Budget or amendment to Tenant for approval; or

9.Any other act or omission by Tenant or any Tenant Party (as defined in the Lease), or persons employed by any of such persons that continues for more than 1 day after Landlord's written notice thereof to Tenant.

If Delivery is delayed for any of the foregoing reasons, then Landlord shall cause the TI Architect to certify the date on which the Tenant Improvements would have been Substantially Completed but for such Tenant Delay and such certified date shall be the date of Delivery.

c.**Changes**. Any changes requested by Tenant to the Tenant Improvements shall be requested and instituted in accordance with the provisions of this Section 4 and shall be subject to the written approval of Landlord and the TI Architect, such approval not to be unreasonably withheld, conditioned or delayed.

i.**Tenant's Request For Changes**. If Tenant shall request changes to the Tenant Improvements ("**Changes**"), Tenant shall request such Changes by notifying Landlord in writing in substantially the same form as the AIA standard change order form (a "**Change Request**"), which Change Request shall detail the nature and extent of any such Change. Such Change Request must be signed by Tenant's Representative. Landlord shall, before proceeding with any Change, use commercially reasonable efforts

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to respond to Tenant as soon as is reasonably possible with an estimate of: (i) the time it will take, and (ii) the architectural and engineering fees and costs that will be incurred, to analyze such Change Request (which costs shall be paid from the TI Fund to the extent actually incurred, whether or not such change is implemented). Landlord shall thereafter submit to Tenant in writing, within 5 business days of receipt of the Change Request (or such longer period of time as is reasonably required depending on the extent of the Change Request), an analysis of the additional cost or savings involved, including, without limitation, architectural and engineering costs and the period of time, if any, that the Change will extend the date on which the Tenant Improvements are Substantially Complete. Any such delay in the completion of the Tenant Improvements caused by a Change, including any suspension of the Tenant Improvements while any such Change is being evaluated and/or designed, shall be Tenant Delay.

ii.**Implementation of Changes**. If Tenant: (i) approves in writing the cost or savings and the estimated extension in the time for completion of the Tenant Improvements, if any, and (ii) deposits with Landlord any Excess TI Costs required in connection with such Change, Landlord shall cause the approved Change to be instituted. Notwithstanding any approval or disapproval by Tenant of any estimate of the delay caused by such proposed Change, the TI Architect's reasonable determination of the amount of Tenant Delay in connection with such Change shall be final and binding on Landlord and Tenant.

d.**Costs**.

i.**Budget For Tenant Improvements**. Before the commencement of construction of the Tenant Improvements, Landlord shall obtain a detailed breakdown by trade of the estimated costs incurred or that will be incurred in connection with the design and construction of the Tenant Improvements (the "**Initial Budget**"). Tenant shall have the right to review and approve, which approval shall not be unreasonably, withheld, conditioned or delayed, the Initial Budget and any amendments to the Initial Budget. Notwithstanding anything to the contrary contained herein, if Tenant does not deliver to Landlord written notice of Tenant's approval or disapproval of the Initial Budget or any amendments thereto within 3 business days after Landlord's delivery thereof to Tenant, the same shall constitute a Tenant Delay. Upon Tenant's approval (or deemed approval) thereof, the Initial Budget or any such amendments thereto shall be deemed the "**Budget**" for purposes of this Work Letter. The Initial Budget shall be based upon the TI Construction Drawings approved by Tenant and shall include a payment to Landlord of administrative rent ("**Administrative Rent**") equal to 3% of the TI Costs (but not to exceed $150,000 in the aggregate) for monitoring and inspecting the construction of the Tenant Improvements and Changes, which sum shall be

payable from the TI Fund (as defined in Section 5(d)). Administrative Rent shall be payable out of the TI Fund. Landlord shall make its records with respect to the Tenant Improvements available to Tenant on an "open book" basis throughout the design and construction of the Tenant Improvements.

ii. **TI Allowance**. Landlord shall provide to Tenant a tenant improvement allowance (collectively, the "**TI Allowance**") as follows:

1. a "**Tenant Improvement Allowance**" in the maximum amount of $175.00 per rentable square foot in the Premises, which is included in the Base Rent set forth in the Lease; and

2. an "**Additional Tenant Improvement Allowance**" in the maximum amount of $75.00 per rentable square foot in the Premises, to the extent used, result in TI Rent as set forth in Section 4(b) of the Lease.

Tenant shall notify Landlord prior to the commencement of construction of the Tenant Improvements how much Additional Tenant Improvement Allowance Tenant has elected to receive from Landlord. Such election shall be final and binding on Tenant, and may not thereafter be modified without Landlord's consent, which may be granted or withheld in Landlord's sole and absolute subjective discretion. The TI Allowance shall be disbursed in accordance with this Work Letter.

In addition to the TI Allowance, Landlord shall pay the reasonable cost for the TI Architect to prepare an initial test fit for the Premises and one revision.

Tenant shall have no right to the use or benefit (including any reduction to or payment of Base Rent) of any portion of the TI Allowance not required for the design, construction or management of (i) the Tenant Improvements described in the TI Construction Drawings approved pursuant to Section 2(d) or (ii) any Changes pursuant to Section 4.

i. **Costs Includable in TI Fund**. The TI Fund shall be used solely for the payment of design, permits and construction costs in connection with the construction of the Tenant Improvements, including, without limitation, the cost of electrical power and other utilities used in connection with the construction of the Tenant Improvements, the cost of preparing the Space Plans and the TI Construction Drawings, all costs set forth in the Budget, including Landlord's Administrative Rent, Landlord's out-of-pocket expenses, costs resulting from Tenant Delays and the cost of Changes (collectively, "**TI Costs**"). Notwithstanding anything to the contrary contained herein, the TI Fund shall not be used to purchase any furniture, personal property or other non-Building system materials or equipment, including, but not limited to, Tenant's voice or data cabling, non-ducted biological safety cabinets and other scientific equipment not incorporated into the Tenant Improvements. For the avoidance of doubt, TI Costs shall not include (i) the remediation of Hazardous Materials discovered in the Premises during the construction of Landlord's Work requiring remediation, (ii) attorneys' fees incurred by Landlord in connection with the negotiation of construction contracts for Landlord's Work, or attorneys' fees, experts' fees and other costs incurred in connection with disputes with third parties in connection with Landlord's Work, (iii) interest and other costs of financing to the cost of Landlord's Work, (iv) the cost of delays in the construction of Landlord's Work arising other than in connection with Changes or other Tenant Delays, or (v) the cost of repairing or restoring Landlord's Work if Landlord's Work is damaged prior to the Substantial Completion of Landlord's Work as a result of a fire or other casualty.

i.**Excess TI Costs**. Landlord shall have no obligation to bear any portion of the cost of any of the Tenant Improvements except to the extent of the TI Allowance. If at any time and from time-to-time, the remaining TI Costs under the Budget exceed the remaining unexpended TI Allowance ("**Excess TI Costs**"), the monthly disbursements of the TI Allowance shall be made in the proportion that the remaining TI Allowance bears to the outstanding TI Costs under the Budget, and Tenant, within 15 business days after Landlord's delivery to Tenant of an invoice therefor, shall fund the balance of each such monthly draw. If Tenant fails to deposit any Excess TI Costs with Landlord, Landlord shall have all of the rights and remedies set forth in the Lease for nonpayment of Rent (including, but not limited to, the right to interest at the Default Rate and the right to assess a late charge). For purposes of any litigation instituted with regard to such amounts, those amounts required to be paid by Tenant will be deemed Rent under the Lease. The TI Allowance and Excess TI Costs are herein referred to as the "**TI Fund**." Notwithstanding anything to the contrary set forth in this Section 5(d), Tenant shall be fully and solely liable for TI Costs and the cost of Minor Variations in excess of the TI Allowance.

2.**Tenant Access**.

ii.**Tenant's Access Rights**. Landlord hereby agrees to permit Tenant access, at Tenant's sole risk and expense, to the Building (i) 30 days prior to the Commencement Date to perform any work ("**Tenant's Work**") required by Tenant other than Landlord's Work, provided that such Tenant's Work is coordinated with the TI Architect and the General Contractor, complies with the Lease and all other reasonable restrictions and conditions Landlord may impose, and does not otherwise interfere with the completion of the Tenant Improvements and (ii) prior to the completion of Landlord's Work, to inspect and observe work in process; all such access shall be during normal business hours or at such other times as are reasonably designated by Landlord. Notwithstanding the foregoing, Tenant shall have no right to enter onto the Premises or the Project unless and until Tenant shall deliver to Landlord evidence reasonably satisfactory to Landlord demonstrating that any insurance reasonably required by Landlord in connection with such pre-commencement access (including, but not limited to, any insurance that Landlord may

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require pursuant to the Lease) is in full force and effect. Any entry by Tenant shall comply with all established safety practices of Landlord's contractor and Landlord until completion of Landlord's Work and acceptance thereof by Tenant.

iii.**No Interference**. Neither Tenant nor any Tenant Party (as defined in the Lease) shall interfere with the performance of Landlord's Work, nor with any inspections or issuance of final approvals by applicable Governmental Authorities, and upon any such interference, Landlord shall have the right to exclude Tenant and any Tenant Party from the Premises and the Project until Substantial Completion of Landlord's Work.

iv.**No Acceptance of Premises**. The fact that Tenant may, with Landlord's consent, enter into the Project prior to the date Landlord's Work is Substantially Complete for the purpose of performing Tenant's Work shall not be deemed an acceptance by Tenant of possession of the Premises, but in such event Tenant shall defend with counsel reasonably acceptable by Landlord, indemnify and hold Landlord harmless from and against any loss of or damage to Tenant's property, completed work, fixtures, equipment, materials or merchandise, and from liability for death of, or injury to, any person, caused by the act or omission of Tenant or any Tenant Party during such early entry.

3.**Miscellaneous**.

v.**Consents**. Whenever consent or approval of either party is required under this Work Letter, that party shall not unreasonably withhold, condition or delay such consent or approval, unless expressly set forth herein to the contrary.

vi.**Modification**. No modification, waiver or amendment of this Work Letter or of any of its conditions or provisions shall be binding upon Landlord or Tenant unless in writing signed by Landlord and Tenant.

vii.**No Default Funding**. In no event shall Landlord have any obligation to fund any portion of the TI Allowance or to perform any Landlord's Work during any period that Tenant is in Default under the Lease.

Schedule 1 to Exhibit C

Space Plans

Intentionally omitted pursuant to Regulation S-K, Item 601(a)(5)

Schedule 2 to Exhibit C

Basis of Design

Intentionally omitted pursuant to Regulation S-K, Item 601(a)(5)

Schedule 3 to Exhibit C

Schedule

Intentionally omitted pursuant to Regulation S-K, Item 601(a)(5)

EXHIBIT D TO LEASE

ACKNOWLEDGMENT OF COMMENCEMENT DATE

This **ACKNOWLEDGMENT OF COMMENCEMENT DATE** is made this _____ day of _____, ____, between **ARE-SAN FRANCISCO NO. 63, LLC**, a Delaware limited liability company ("**Landlord**"), and **CODEXIS, INC.**, a Delaware corporation ("**Tenant**"), and is attached to and made a part of the Lease dated _____, _____ (the "**Lease**"), by and between Landlord and Tenant. Any initially capitalized terms used but not defined herein shall have the meanings given them in the Lease.

Landlord and Tenant hereby acknowledge and agree, for all purposes of the Lease, that the Commencement Date of the Base Term of the Lease is _____, _____, the Rent Commencement Date is _____, _____, and the termination date of the Base Term of the Lease shall be midnight on _____, _____. In case of a conflict between the terms of the Lease and the terms of this Acknowledgment of Commencement Date, this Acknowledgment of Commencement Date shall control for all purposes.

IN WITNESS WHEREOF, Landlord and Tenant have executed this ACKNOWLEDGMENT OF COMMENCEMENT DATE to be effective on the date first above written.

TENANT:

CODEXIS, INC.,
a Delaware corporation

By:
Its:

By:
Its:

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:
Its:

EXHIBIT E TO LEASE

Rules and Regulations

Intentionally omitted pursuant to Regulation S-K, Item 601(a)(5)

EXHIBIT F TO LEASE

TENANT'S PERSONAL PROPERTY

None.

EXHIBIT G TO LEASE

ORDER

Intentionally omitted pursuant to Regulation S-K, Item 601(a)(5)

EXHIBIT B

ASSIGNMENT EFFECTIVE DATE MEMORANDUM

[***]

EXHIBIT C

CONVEYED FF&E

[***]

EXHIBIT D

SALE EQUIPMENT

[***]

CONSENT TO ASSIGNMENT
AND FIRST AMENDMENT

This Consent to Assignment and First Amendment (this "**Consent**") is made as of September 6, 2023, by **ARE-SAN FRANCISCO NO. 63, LLC**, a Delaware limited liability company ("**Landlord**"), to **CODEXIS, INC.,** a Delaware corporation ("**Tenant**"), and **VAXCYTE, INC.**, a Delaware corporation ("**Assignee**"), with reference to the following Recitals.

R E C I T A L S

A. Landlord and Tenant are parties to that certain Lease Agreement dated January 29, 2021 (the "**Lease**"). Pursuant to the Lease, Tenant leases from Landlord certain premises containing approximately 36,593 rentable square feet, consisting of (i) Suite 100A containing approximately 18,817 rentable square feet, and (ii) Suite 200B containing approximately 17,776 rentable square feet (the "**Premises**") in that certain building located at 825 Industrial Road, San Carlos, California (the "**Building**"). Capitalized terms not otherwise defined in this Consent shall have the meanings set forth in the Lease unless the context clearly indicates otherwise.

B. Tenant desires to assign its interest in the Lease and the Premises demised thereunder, to Assignee, all as more particularly described in and pursuant to the provisions of that certain ***ASSIGNMENT AND ASSUMPTION OF LEASE*** dated as of September 1, 2023 (the "**Assignment Agreement**"), a copy of which is attached hereto as **Exhibit A**.

C. Tenant and Assignee desire to obtain Landlord's consent to the assignment of the Lease to Assignee (the "**Assignment**") as contemplated in the Assignment Agreement.

D. Tenant and Assignee have requested certain other modifications to the Lease, and Landlord desires to accommodate such request, subject to the terms and conditions set forth herein.

NOW, THEREFORE, in consideration of the foregoing and the agreements contained herein, and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Landlord hereby consents to the Assignment and the amendments to the Lease contemplated herein; such consent being subject to and upon the following terms and conditions to which Tenant and Assignee hereby agree:

1. **Consent to Assignment**.

1.1. This Consent shall not be effective and the Assignment shall not be valid nor shall Assignee take possession of the Premises unless and until Landlord shall have received: (a) counterparts of this Consent executed by Tenant and Assignee, and (b) on or before the Effective Date (as defined in the Assignment Agreement)(the "**Assignment Date**") Tenant shall deliver to Landlord the then full outstanding principal balance of TI Rent remaining unpaid under the Lease as of such date of payment. Tenant and Assignee represent and warrant to Landlord that the copy of the Assignment Agreement attached hereto as **Exhibit A** is true, correct and complete. Assignee shall deliver to Landlord an insurance certificate satisfying the requirements of the Lease prior to the earlier of: (x) Assignee accessing the Premises under the Assignment Agreement, or (y) the Assignment Date.

1.2. Landlord neither approves nor disapproves the terms, conditions and agreements contained in the Assignment Agreement, all of which shall be subordinate and at all times subject to all of the covenants, agreements, terms, provisions and condi tions contained in the Lease and this Consent.

1.3. Nothing contained herein or in the Assignment Agreement shall be construed to modify, waive, impair, or affect any of the terms, covenants or conditions contained in the Lease (including Assignee's obligation to obtain any required consents for any other or future assignments or sublettings), or to waive any breach thereof, or any rights or remedies of Landlord under the Lease against any person, firm, association or corporation liable for the performance thereof, or to enlarge or increase Landlord's obligations or liabilities under the Lease, and all terms, covenants and conditions of the Lease are hereby declared by each of Landlord, Tenant and Assignee to be in full force and effect, subject to the terms of this Consent. Nothing contained herein shall release Tenant from any obligations of Tenant accruing under the Lease prior to the Assignment Date and/or any obligations that would survive the expiration or earlier termination of the Lease had the Lease terminated on the day immediately preceding the Assignment Date (collectively, the "**Tenant Surviving Obligations**"). Except for the Tenant Surviving Obligations, Landlord hereby releases Tenant from any and all obligations and liabilities under the Lease that first accrue from and after the Assignment Date.

1.4. Notwithstanding anything in the Assignment Agreement to the contrary:

a. Commencing on the Assignment Date, Assignee does hereby expressly assume and agree to be bound by the Lease and to perform and comply with, for the benefit of Landlord, each and every obligation of Tenant under the Lease accruing from and after the Assignment Date.

b. Tenant and Assignee agree to each of the terms and conditions of this Consent, and upon any conflict between the terms of the Assignment Agreement and this Consent, the terms of this Consent shall control.

1.5. The mention in this Consent of any particular remedy shall not preclude Landlord from any other remedy in law or in equity.

1.6. Concurrent with Tenant's delivery of an executed counterpart of this Consent to Landlord, Tenant shall, pursuant to the terms of Section 22(b) of the Lease, pay to Landlord a fee in the amount of $2,500 in consideration of Landlord's review of the Assignment Agreement and preparation of this Consent.

1.7. Tenant and Assignee agree that the Assignment Agreement will not be modified or amended in any way without the prior written consent of Landlord, which consent shall not be unreasonably withheld, conditioned or delayed. Any modification or amendment of the Assignment Agreement without Landlord's prior written consent shall be void and of no force or effect.

1.8. Tenant shall provide written notice to Landlord: (i) at least (5) business days prior to the Assignment Date, or (ii) within three (3) business days following Assignee's exercise of its right to terminate the Assignment pursuant to Section 3 of the Assignment Agreement.

2. **Lease Amendment**. Effective as of the Assignment Date, Landlord and Assignee hereby agree that the Lease is hereby amended as follows:

2.1. Base Rent. On or before the Assignment Date, Tenant shall deliver to Landlord Base Rent for the period commencing on the Assignment Date through the date which is 3 months after the Assignment Date (the "**Base Rent Abatement Amount**"). Notwithstanding anything to the contrary contained in the Lease, Assignee, as "Tenant" under the Lease, shall not be required to pay Base Rent for the period commencing on the Assignment Date through the date which is 3 months after the Assignment Date and Landlord shall apply the Base Rent

Abatement Amount actually delivered by Tenant to the Base Rent payable under the Lease during such period.

2.2. Security Deposit.

a. Commencing on the Assignment Date, the defined term "Security Deposit" on page 1 of the Lease shall be amended to read as follows:

"**Security Deposit**: $220,655.79"

b. As of the date hereof, Landlord holds a Letter of Credit in the amount of $415,696.48 (the "**Codexis Letter of Credit**"). Within ten (10) business days after the Assignment Date, Landlord shall execute any documentation reasonably required for the cancelation of the Codexis Letter of Credit (and, if required by the issuer thereof for cancelation, return the original thereof). On or before the Assignment Date, Assignee shall deliver to Landlord a Security Deposit in the amount of Two Hundred Twenty Thousand, Six Hundred Fifty-Five and 79/100 Dollars ($220,655.79), in the form of a Letter of Credit satisfying the requirements set forth in the Lease. Notwithstanding the foregoing, if Assignee is delayed in delivering to Landlord such Security Deposit, Landlord shall have the right to continue to hold the Codexis Letter of Credit until the date which is ten (10) business days after Assignee delivers to Landlord such Security Deposit. If Assignee has not delivered such Security Deposit within thirty (30) days after the Assignment Date, Landlord shall have the right, but not the obligation, to draw on the Codexis Letter of Credit in the amount of the Security Deposit and hold such proceeds until the date which is ten (10) business days after Assignee delivers to Landlord such Security Deposit (at which time Landlord shall return such proceeds to Tenant).

c. Notwithstanding anything to the contrary contained in Section 40 of the Lease, if Assignee exercises the Extension Right pursuant to the terms and conditions set forth in Section 40 of the Lease, Landlord may require that Assignee either (i) renew or extend the existing Letter of Credit, or (ii) provide a new Letter of Credit, pursuant to the terms and conditions set forth in Section 6 of the Lease.

2.3. Additional TI Allowance. Section 4(b) of the Lease is hereby deleted in its entirety and have no further force or effect.

2.4. Alterations. In accordance with the terms of Section 12 of the Lease, Tenant shall not be required to remove or restore the Tenant Improvements, or any other alterations or improvements existing in the Premises as of the date of this Consent, at the expiration or earlier termination of the Term, nor shall Tenant have the right to remove any of the Tenant Improvements, or any other alterations or improvements existing in the Premises as of the date of this Consent, at any time during the Term or upon the expiration or earlier termination of the Term.

2.5. Right to Expand. Section 39 of the Lease is hereby deleted in its entirety and have no further force or effect.

2.6. Extension Right. Section 40 of the Lease shall remain in full force and effect. Notwithstanding the provisions of Section 40(c) of the Lease, Landlord hereby consents to the assignment of the Extension Right to Assignee and Section 40(c) of the Lease shall remain in full force and effect.

Landlord and Assignee hereby agree that except for the Tenant Surviving Obligations, Landlord hereby releases Tenant from any and all obligations and liabilities under the Lease that accrue from and after the

Assignment Date, including, without limitation any exercise of the Extension Right, expansion of the Premises, extension of the term of the Lease or any further amendment or modification of the Lease.

3. **Condition of the Premises**. As between Landlord and Tenant, Tenant shall be required to deliver the Premises to Assignee on the Assignment Date in the same condition that Tenant would have been required to surrender the Premises to Landlord at the expiration of the Term, including, without limitation, completion of the Decommissioning and HazMat Closure Plan with respect to Tenant's lab operations in the Premises. Tenant shall not remove from the Premises any of the Tenant Improvements or any other alterations or improvements permitted by the Lease existing as of the date of this Consent.

4. **Representations and Warranties; Acknowledgment of Commencement Date.**

4.1. Tenant. Tenant hereby represents and warrants to Landlord and Assignee that, as of the date of this Consent, to Tenant's knowledge, without duty of investigation or inquiry, (i) Landlord is not in default under the Lease, (ii) no consent of any partner, shareholder, creditor, investor, judicial or administrative body, authority or other party is required of Tenant that has not been obtained in connection with the Assignment or this Consent, (iii) the individuals executing this Consent and the instruments referenced herein on behalf of Tenant and the partners, officers or trustees of Tenant, if any, have the legal power, right, and actual authority to bind Tenant to the terms and conditions hereof and thereof, and (iv) there are no modifications to the Lease except as expressly set forth in this Consent.

4.2. Assignee. Assignee hereby represents and warrants to Landlord and Tenant that, as of the date of this Consent, to Assignee's knowledge, without duty of investigation or inquiry, (i) no consent of any partner, shareholder, creditor, investor, judicial or administrative body, authority or other party is required of Assignee that has not been obtained in connection with the Assignment or this Consent, and (ii) the individuals executing this Consent and the instruments referenced herein on behalf of Assignee and the partners, officers or trustees of Assignee, if any, have the legal power, right, and actual authority to bind Assignee to the terms and conditions hereof and thereof.

4.3. Landlord. Landlord hereby represents and warrants to Tenant and Assignee that, as of the date of this Consent, to Landlord's knowledge, without duty of investigation or inquiry, (i) Tenant is not in default under the Lease, (ii) no consent of any partner, shareholder, creditor, investor, judicial or administrative body, authority or other party is required of Landlord in connection with this Consent that has not been obtained, (iii) the individuals executing this Consent and the instruments referenced herein on behalf of Landlord and the partners, officers or trustees of Landlord, if any, have the legal power, right, and actual authority to bind Landlord to the terms and conditions hereof and thereof, and (iv) there are no modifications to the Lease except as expressly set forth in this Consent.

4.4. Acknowledgment of Commencement Date. Pursuant to that certain Acknowledgement of Commencement Date dated as of December 5, 2022 executed by Landlord and Tenant, the Commencement Date of the Base Term of the Lease occurred on November 30, 2021 and the termination date of the Base Term under the Lease is November 30, 2031.

5. **Miscellaneous**.

5.1. This Consent may be executed in multiple 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 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 Consent and all matters related thereto, with such electronic signatures having the same legal effect as original signatures.

5.2. This Consent and the legal relations between the parties hereto shall be governed by and construed and enforced in accordance with the internal laws of the state in which the Premises is located, without regard to its principles of conflicts of law.

5.3. Each of Tenant and Assignee are currently (a) in compliance with and, with respect to the Assignee, 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, with respect to the Assignee, 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.

5.4. Tenant shall pay any broker commissions or fees that may be payable as a result of the Assignment pursuant to a separate agreement and Tenant hereby indemnifies and agrees to hold Landlord harmless from and against any loss or liability arising therefrom or from any other commissions or fees payable in connection with the Assignment which result from the actions of Tenant. Assignee hereby indemnifies and agrees to hold Landlord harmless from and against any loss or liability arising from any commissions or fees payable in connection with the Assignment which result from the actions of Assignee.

5.5. Section 41(p) of the Lease entitled "California Accessibility Disclosure" is hereby incorporated by reference.

5.6. Tenant and Assignee acknowledge that Landlord's business operations are proprietary to Landlord. Absent prior written consent from Landlord, Tenant and Assignee shall hold confidential and will not disclose to third parties, and shall require their respective agents, assignees, sublessees, employees, invitees and contractors, 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. Notwithstanding the foregoing, Tenant and Assignee may disclose such information (x) to Tenant's or Assignee's respective employees, board of directors, committees, lenders, investors, third parties, consultants and advisors as reasonably required in the ordinary course of Tenant's or Assignee's respective operations, provided that each of Tenant and Assignee shall request that such parties treat the information as confidential, (y) for compliance with a valid order of a court or other governmental body having jurisdiction, or any law, statute, or regulation, and (z) where required in connection with a dispute resolution proceeding between the parties.

5.7. Any notice given by Landlord to Tenant or Assignee following the Assignment Date may be delivered by (i) reputable overnight courier, or (ii) hand delivery with signature confirming receipt to the following address:

Tenant's notice address following the Assignment Date:

Codexis, Inc.
400 Penobscot Drive
Redwood City, California 94063
Attention: Chief Operating Officer

With a copy to:

Codexis, Inc.
400 Penobscot Drive
Redwood City, California 94063
Attention: General Counsel

Assignee's notice address following the Assignment Date:

Vaxcyte, Inc.
825 Industrial Road, 3rd Floor
San Carlos, California 94070
Attention: Chief Executive Officer

With a copy to:

Vaxcyte, Inc.
825 Industrial Road, 3rd Floor
San Carlos, California 94070
Attention: General Counsel

[Signature Page Follows]

IN WITNESS WHEREOF, Landlord, Tenant and Assignee have caused their duly authorized representatives to execute this Consent as of the date first above written.

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

TENANT*:* **CODEXIS, INC.**,
a Delaware corporation

By: /s/ Kevin Norrett
Name: Kevin Norrett
Its: Chief Operating Officer

I hereby certify that the signature, name, and title above are my signature, name and title.

CODEXIS, INC.,
a Delaware corporation

By: /s/ Sri Ryali
Name: Sri Ryali
Its: CFO

I hereby certify that the signature, name, and title above are my signature, name and title.

ASSIGNEE: **VAXCYTE, INC.**,
a Delaware corporation

By: /s/ Grant Pickering
Name: Grant Pickering
Its: CEO

I hereby certify that the signature, name, and title above are my signature, name and title.

Exhibit A

Copy of Assignment Agreement

[***]

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 AMENDED AND RESTATED SUTROVAX AGREEMENT

This Third Amendment ("**Amendment No. 3**") to the Amended and Restated SutroVax Agreement, dated as of October 12, 2015, as amended on May 9, 2018 and May 29, 2018 ("**Amended and Restated Agreement**"), is made as of September 28, 2023 ("**Amendment No. 3 Effective Date**") by and between Sutro Biopharma, Inc., having its principal place of business at 310 Utah Avenue, Suite 150, South San Francisco, CA 94080, USA ("**Sutro**"), and Vaxcyte, Inc., having its principal place of business at 825 Industrial Road, Suite 300, San Carlos, CA 94070 ("**Vaxcyte**"). Sutro and Vaxcyte are each referred to herein individually as a "**Party**" and collectively as the "**Parties**."

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 and Sutro have mutually agreed upon the Form Definitive Agreement to be entered into between the Parties in the event that Vaxcyte exercises the option in accordance with the terms of the Option Agreement (and an executed copy of such agreement is being held in escrow pending Vaxcyte's exercise of the option in accordance with the terms of the Option Agreement);

WHEREAS, Vaxcyte has paid, or will pay, to Sutro the remaining five million dollars ($5,000,000) portion of the Option Purchase Price (as defined in the Option Agreement) that is now payable in accordance with the terms of the Option Agreement as a result of the Parties mutually agreeing upon the Form Definitive Agreement; and

WHEREAS, the Parties wish to amend certain provisions of the Amended and Restated Agreement, including with respect to certain amendments contemplated by the Option Agreement to take effect upon the Parties' mutual agreement on the Form Definitive Agreement.

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:

1. All references in the Amended and Restated Agreement to "SutroVax" are hereby replaced with "Vaxcyte."

2. The following shall be inserted as Section 1.8A of the Amended and Restated Agreement:

1.8A [***].

3. Section 1.21 of the Amended and Restated Agreement is restated as follows:

1.21 "**Sutro Core Know-How**" means any processes, documents, materials or other Sutro Know-How owned or controlled by Sutro that relate to the manufacture or supply of Extracts (including, but not limited to, any such Sutro Know-How regarding the generation and/or use of strains from which Extract is produced).

4. Section 1.22 of the Amended and Restated Agreement is restated 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, 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. 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.

5. Section 1.25 of the Amended and Restated Agreement is restated as follows:

1.25 [**Intentionally left blank**]

6. Section 1.26 of the Amended and Restated Agreement is restated as follows:

1.26 [**Intentionally left blank**]

7. The following sentence is added to the end of Section 1.33 of the Amended and Restated Agreement (the definition of "Valid Claim"):

References to "Sutro Patents" in this Section 1.33 shall exclude any Patents included in any [***] IP or any Jointly-Owned IP.

8. Section 4.5 of the Amended and Restated Agreement is hereby restated in its entirety as follows:

4.5 **Grant-Back**. Subject to the terms and conditions of this Agreement, Vaxcyte hereby grants to Sutro and its Affiliates, and shall cause its Sublicensees to grant to Sutro and its Affiliates, an exclusive (including as to Vaxcyte, its Affiliates and Sublicensees), perpetual, royalty-free, worldwide license, with the right to sublicense through multiple tiers, to exploit any Vaxcyte Platform

Improvements [***]. For purposes of this Section 4.5, "**Vaxcyte Platform Improvements**" means [***].

9. Section 6.2 of the Amended and Restated Agreement is hereby deleted in its entirety and replaced with the following:

6.2 Royalties shall be due under Section 6.1, on a Vaccine Composition-by-Vaccine Composition basis, until the end of the Royalty Term for such Vaccine Composition, provided that the amounts set forth in Section 6.1 shall be reduced, on a country-by-country and Vaccine Composition-by-Vaccine Composition basis, by [***] during any portion of the Royalty Term in which there is not at least one Valid Claim of Sutro Patents covering the manufacture, use, sale, offer for sale or importation of the applicable Vaccine Composition in the country of sale.

10. Section 6.7 of the Amended and Restated Agreement is hereby deleted in its entirety and replaced with the following:

6.7 All amounts payable pursuant to Section 6.1 and 6.6 of this Agreement shall be due quarterly (i) within [***] following the end of each Calendar Quarter in respect of Net Sales by Vaxcyte or its Affiliate, or within [***] following Vaxcyte's receipt of royalty payments from its Sublicensee with respect to Net Sales by such Sublicensee, and (ii) within [***] after the end of each Calendar Quarter in respect of Net Sublicense Fees, received in such quarter. Each such payment shall be accompanied by a statement of Net Sales and Net Sublicense Fees for the applicable Calendar Quarter and the calculation of amounts payable hereunder, [***].

11. Section 8.6(a) of the Amended and Restated Agreement is hereby restated in its entirety as follows:

The provisions of Articles 1, 6 (with respect to payments accrued prior to the effective date of termination), 8, 10, 12, 13, 14 and 15, and Section 4.5, Section 9.1(b-1), Section 9.1(b-2), Section 9.1(b-4), Section 9.1(b-5), and Section 9.1(d), shall survive termination of this Agreement for any reason; and

12. Section 9.1(b) of the Amended and Restated Agreement is hereby restated in its entirety as follows:

(b-1) **Ownership of Intellectual Property**. Notwithstanding anything to the contrary in the Existing Agreements, as between the Parties and their respective Affiliates:

(i) 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**");

(ii) [***] 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 the [***] (such methods, including all intellectual property rights therein, the "[***] **Extract IP**");

(iii) [***] 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

(iv) 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**").

(b-2) **Certain Definitions**. For purposes of this Agreement, (I) "**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 pursuant to (A) this Agreement, (B) that certain Supply Agreement, dated May 29, 2018, as amended (the "**Supply Agreement**"), (C) that certain letter agreement [***], dated December 19, 2022 (the "[***] **Letter Agreement**"), (D) [***] or (E) otherwise, in each case of the foregoing clauses (A)-(E) by and between Vaxcyte and Sutro, and (II) [***].

(b-3) **Licensed-Back IP; Effect on Royalties**. The [***] IP shall be (and is hereby) licensed back to Vaxcyte under Section 4.1(a), in the same manner as Sutro Patents and Sutro Know-How are licensed thereunder. Each Party's interest in the Jointly-Owned IP shall be subject to the licenses granted under this Agreement, such that [***] shall have the exclusive right to exploit and freely sublicense the Jointly-Owned IP [***], and [***] shall have the exclusive right to exploit and sublicense the Jointly-Owned IP [***] in accordance with this Agreement, in each case, without the obligation to obtain any consent from (or account to) the other Party in respect thereof. Notwithstanding anything to the contrary herein, 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 to extend [***] (i.e., such ownership or ownership interest [***] in respect of the references to [***] in the definition of [***], the definition of [***] or in [***]).

(b-4) **Assignment of Intellectual Property**. If and to the extent that Vaxcyte or its Affiliates or Sublicensees 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 and Sublicensees 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 9.1(b-1)(i).

(b-5) **Patent Prosecution**.

(i) 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.

(ii) Notwithstanding anything to the contrary herein, [***] 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 9.1(b-5)(ii)(II) [***] shall reasonably consider incorporating [***] comments; [***].

(iii) [***] 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 [***].

(iv) 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 9.1(b-5)(v)). [***].

(v) 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, [***].

(vi) If, in connection with this Section 9.1(b-5), 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 XIV shall apply.

13. Section 9.1(c) of the Amended and Restated Agreement is hereby restated in its entirety as follows:

(c) [**Intentionally left blank**]

14. Section 9.1(d) of the Amended and Restated Agreement is hereby restated in its entirety as follows:

(d) Subject to ownership of the [***] IP, Jointly-Owned IP, [***] Extract IP and [***] IP, it is understood and agreed that, as between the Parties, inventions (and Patent rights therein) shall be owned by [***]. Accordingly, subject to ownership of the [***] IP, Jointly-Owned IP, [***] Extract IP and [***] IP, as between the Parties, [***].

15. Section 9.2(a) of the Amended and Restated Agreement are hereby restated in their entirety as follows:

(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 (1) initiating or prosecuting an infringement or other appropriate suit or action against such Third Party, and (2) defending any declaratory

judgment action with respect thereto (the type of action described in each of (1) and (2), 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 9.2(a)(ii) or Section 9.2(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; provided, that the Lead Enforcing Party shall cooperate and provide reasonable to the extent necessary to join the Lead Enforcing Party as a necessary or indispensable party to any such Enforcement Action (to the extent applicable).

(v) **Recoveries**. Any amounts recovered by Vaxcyte or Sutro with respect to an Enforcement Action under this Section 9.2(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).

16. Section 9.2(b) of the Amended and Restated Agreement is hereby restated in its entirety as follows:

(b) Other 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) [***].

17. Section 9.2(c) of the Amended and Restated Agreement is hereby restated in its entirety as follows:

(c) **Cooperation**. If a Party brings an Enforcement Action in accordance with this Section 9.2, 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 this Section 9.2 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 this Section 9.2 in a manner that [***].

18. Section 9.3 of the Amended and Restated Agreement is hereby restated in its entirety as follows:

9.3 **Patent Term Extensions**. Notwithstanding Section 9.1 above, but subject to the terms of the [***] In-License with respect to [***] Patents in-licensed thereunder, [***] shall have the exclusive right, itself or through a designee, to seek patent term extensions and similar supplemental protections ("**Patent Term Extensions**") as may be available with respect to [***]; provided that [***] shall not have the right to seek or obtain [***].

19. Sections 15.2(a)-(b) of the Amended and Restated Agreement are hereby restated in their entirety as follows:

15.2 In the event of a Change of Control of either Party, notwithstanding Section 15.1 above:

(a) In the event of a Change of Control of Sutro, (A) [***], and (B) [***].

(b) In the event of a Change of Control of Vaxcyte, (A) [***], and (B) [***].

20. **Effect of Amendment**. Except as expressly modified herein, all terms and conditions set forth in the Amended and Restated Agreement shall remain in full force and effect.

21. **Counterparts; Electronic or Facsimile Signatures**. This Amendment No. 3 may be executed in any number of counterparts, each of which shall be an original, but all of which together shall constitute one instrument. This Amendment No. 3 may be executed and delivered electronically or by facsimile and upon such delivery such electronic or facsimile signature will be deemed to have the same effect as if the original signature had been delivered to the other Party.

[signature page follows]

In Witness Whereof, the Parties hereto have caused this Amendment No. 3 to be executed and entered into by their duly authorized representatives as of the Amendment No. 3 Effective Date.

VAXCYTE, INC.

By: /s/ Grant E. Pickering

Name: Grant E. Pickering

Title: Chief Executive Officer

Date: September 28, 2023

SUTRO BIOPHARMA INC.

By: /s/ William J. Newell

Name: William J. Newell

Title: Chief Executive Officer

Date: September 28, 2023

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 Quarterly Report on Form 10-Q 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: November 6, 2023

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 Quarterly Report on Form 10-Q 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: November 6, 2023 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, President and Chief Financial Officer of the Company, each hereby certifies that, to the best of his or her knowledge:

1. The Company's Quarterly Report on Form 10-Q for the period ended September 30, 2023, to which this Certification is attached as Exhibit 32.1 (the "Periodic 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 Periodic Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Dated: November 6, 2023

/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-Q 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-Q), irrespective of any general incorporation language contained in such filing."