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

FORM 10-K

(Mark One)

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

For the fiscal year ended December 31, 2021

or

o **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 001-40502

Lyell Immunopharma, Inc.

(Exact name of registrant as specified in its charter)

Delaware	**83-1300510**
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)
201 Haskins Way **South San Francisco, California**	**94080**
(Address of Principal Executive Offices)	(Zip Code)

(650) 695-0677

Registrant's telephone number, including area code

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, $0.0001 par value per share	LYEL	NASDAQ Global Select Market

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

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act.

Yes o No x

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes o No x

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 x No o

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate web site, if any, every Interactive Data File required to be submitted and posted 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 and post such files).Yes x No o

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

Large accelerated filer	o	Accelerated filer	o
Non-accelerated filer	x	Smaller reporting company	o
		Emerging growth company	x

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. o

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

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Act). Yes o No x

The aggregate market value of the common stock held by non-affiliates of the registrant on June 30, 2021, the last business day of the registrant's most recently completed second fiscal quarter was approximately $2,741,432,000 based on the closing price reported for such date on the NASDAQ Global Select Market.

Shares of common stock beneficially owned by each executive officer, director, and holder of more than 10% of our common stock have been excluded in that such persons may be deemed to be affiliates. This determination of affiliate status is not necessarily a conclusive determination for other purposes.

The registrant had outstanding 245,388,050 shares of common stock as of March 25, 2022.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's Proxy Statement for the 2022 Annual Meeting of Stockholders are incorporated herein by reference in Part III of this Annual Report on Form 10-K to the extent stated herein. Such proxy statement will be filed with the Securities and Exchange Commission within 120 days of the registrant's fiscal year ended December 31, 2021.

Lvell Immunopharma, Inc.
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SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This Annual Report on Form 10-K contains forward-looking statements. All statements other than statements of historical facts contained in this Annual Report on Form 10-K, including statements regarding our future results of operations and financial position, business strategy, product candidates, planned nonclinical studies and clinical trials, results of nonclinical studies, clinical trials, research and development costs, planned regulatory submissions, regulatory approvals, timing and likelihood of success, as well as plans and objectives of management for future operations, are forward-looking statements. These statements involve known and unknown risks, uncertainties and other important factors that are in some cases beyond our control and may cause our actual results, performance or achievements to be materially different from any future results, performance or achievements expressed or implied by the forward-looking statements.

In some cases, you can identify forward-looking statements by terms such as "may," "will," "should," "would," "expect," "plan," "anticipate," "could," "intend," "target," "project," "believe," "estimate," "predict," "potential," or "continue" or the negative of these terms or other similar expressions. Forward-looking statements contained in this Annual Report on Form 10-K include, but are not limited to, statements about:

- the sufficiency of our existing cash to fund our future operating expenses and capital expenditure requirements;
- the accuracy of our estimates regarding expenses, revenue opportunities, capital requirements and needs for additional financing;
- the scope, progress, results and costs of developing LYL797, LYL845 or any other product candidates we may develop, and conducting nonclinical studies and clinical trials, including for LYL797 and LYL845;
- the timing and costs involved in obtaining and maintaining regulatory approval of LYL797, LYL845 or any other product candidates we may develop, and the timing or likelihood of regulatory filings and approvals, including our expectation to seek special designations for our product candidates for various diseases;
- our expectations regarding GlaxoSmithKline's (GSK) plans for the NY-ESO-1 programs;
- our plans relating to commercializing LYL797, LYL845 or any other product candidates we may develop, if approved, including the geographic areas of focus and our ability to grow a sales force;
- the size of the market opportunity for LYL797, LYL845 or any other product candidates we may develop in each of the diseases we target;
- our reliance on third parties to conduct nonclinical research activities for LYL797, LYL845 or any other product candidates we may develop;
- the characteristics, safety, efficacy and therapeutic effects of LYL797, LYL845 or any other product candidates we may develop;
- our estimates of the number of patients in the United States who suffer from the diseases we target and the number of subjects that will enroll in our clinical trials;
- the progress and focus of our and GSK's current and planned clinical trials of our product candidates, and the reporting of data from those trials, including the timing thereof;
- the ability of our clinical trials to demonstrate the safety and efficacy of LYL797, LYL845 or any other product candidates we may develop, and other positive results;
- the success of competing therapies that are, or may become, available;
- developments relating to our competitors and our industry, including competing product candidates and therapies;
- our plans relating to the further development and manufacturing of LYL797, LYL845 or any other product candidates we may develop, including additional indications that we may pursue;
- existing regulations and regulatory developments in the United States and other jurisdictions;
- our potential and ability to successfully manufacture and supply LYL797, LYL845 or any other product candidates we may develop for clinical trials and for commercial use, if approved;
- the rate and degree of market acceptance of LYL797, LYL845 or any other product candidates we may develop, as well as the pricing and reimbursement of LYL797, LYL845 or any other product candidates we may develop, if approved;

- our continued reliance on third parties to conduct additional clinical trials of LYL797, LYL845 or any other product candidates we may develop, and for the manufacture of our product candidates;
- the scope of protection we are able to establish and maintain for intellectual property rights, including LYL797, LYL845 or any other product candidates we may develop;
- our ability to retain the continued service of our key personnel and to identify, hire and then retain additional qualified personnel;
- our expectations regarding the impact of the COVID-19 pandemic on our business and operations, including clinical trials, manufacturing suppliers, collaborators, use of contract research organizations (CROs) and employees;
- our expectations regarding the period during which we will qualify as an emerging growth company under the Jumpstart Our Business Startups Act of 2012 (the JOBS Act); and
- our anticipated use of our existing cash, cash equivalents and marketable securities.

We have based these forward-looking statements largely on our current expectations and projections about our business, the industry in which we operate and financial trends that we believe may affect our business, financial condition, results of operations and prospects and these forward-looking statements are not guarantees of future performance or development. These forward-looking statements speak only as of the date of this Annual Report on Form 10-K and are subject to a number of risks, uncertainties and assumptions described in the section titled “Risk Factors” and elsewhere in this Annual Report on Form 10-K. Because forward-looking statements are inherently subject to risks and uncertainties, some of which cannot be predicted or quantified, you should not rely on these forward-looking statements as predictions of future events. The events and circumstances reflected in our forward-looking statements may not be achieved or occur and actual results could differ materially from those projected in these forward-looking statements. Except as required by applicable law, we undertake no obligation to update or supplement any forward-looking statements publicly, or to update or supplement the reasons that actual results could differ materially from those projected in these forward-looking statements, even if new information becomes available in the future.

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

SUMMARY OF RISK FACTORS

Below is a summary of material factors that make an investment in our securities speculative or risky. Importantly, this summary does not address all of the risks and uncertainties that we face. Additional discussion of the risks and uncertainties summarized in this risk factor summary, as well as other risks and uncertainties that we face, can be found under "Risk Factors" in Part I, Item 1A of this Annual Report on Form 10-K. This summary is qualified in its entirety by that more complete discussion of such risks and uncertainties. You should carefully consider the risks and uncertainties described under "Risk Factors" in Part I, Item 1A of this Annual Report on Form 10-K as part of your evaluation of an investment in our common stock.

- We are an early clinical stage biopharmaceutical company and have incurred substantial losses since our inception and anticipate that we will continue to incur substantial and increasing net losses for the foreseeable future.
- We operate in a rapidly evolving field and have a limited operating history, which may make it difficult to evaluate the success of our business to date and to assess our future viability.
- We will require substantial additional capital to achieve our goals, and a failure to obtain this necessary capital when needed could force us to delay, limit, reduce or terminate our product development or commercialization efforts.
- We are early in our research and development efforts and just beginning clinical development of our product candidates with the recent initiation of our Phase 1 clinical trial of LYL797. Besides LYL797, all of our other proprietary product candidates are currently in preclinical development. If we are unable to successfully develop and commercialize product candidates or experience significant delays in doing so, our business may be harmed.
- Our product candidates and technology platforms are based on novel technologies that are unproven and may not result in approvable or marketable products, which exposes us to unforeseen risks and makes it difficult for us to predict the time and cost of product development and potential for regulatory approval and we may not be successful in our efforts to use and expand our technology platforms to build a pipeline of product candidates.
- Our cellular therapy product candidates represent new therapeutic approaches that could result in heightened regulatory scrutiny, delays in clinical development or delays in or our inability to achieve regulatory approval, commercialization or payor coverage of our product candidates.
- The results of research, preclinical studies or earlier clinical trials are not necessarily predictive of future results. Any product candidate we advance into clinical trials may not have favorable results in later clinical trials or receive regulatory approval.
- Clinical development involves a lengthy and expensive process with an uncertain outcome.
- We intend to manufacture at least a portion of our product candidates ourselves. Delays in commissioning and receiving regulatory approvals for our manufacturing facility could delay our development plans and thereby limit our ability to generate product revenues.
- The manufacturing of cellular therapies is very complex. We are subject to a multitude of manufacturing risks, any of which could substantially increase our costs, delay our programs or limit supply of our product candidates.
- We have entered into a collaboration with GSK and may form or seek collaborations or 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 face substantial competition, which may result in others discovering, developing or commercializing products before or more successfully than we do.
- Our business could continue to be adversely affected by the effects of health epidemics, including the COVID-19 pandemic, 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.
- If we are unable to obtain and maintain sufficient intellectual property protection for our product candidates, or if the scope of the intellectual property protection is not sufficiently broad, our ability to commercialize our product candidates successfully and to compete effectively may be adversely affected.

PART I

Item 1. Business

Overview

We are a T-cell reprogramming company dedicated to the mastery of T cells to cure patients with solid tumors. We believe the key to effective cell therapy is the deep and profound understanding of the identity, fate and function of cells to create living medicines. We take a systematic, interrogative, cell biology-driven approach to overcome what we view as the two major barriers to successful Adoptive Cell Therapy (ACT) – (1) T-cell exhaustion and (2) lack of durable stemness – through the application of our proprietary *ex vivo* genetic and epigenetic reprogramming technologies, Gen-R™ and Epi-R™. Our technologies are designed to be applied in a target and modality agnostic manner to chimeric antigen receptor (CAR), tumor-infiltrating lymphocytes (TIL) and T-cell receptor (TCR) therapies to fundamentally improve the properties of T cells needed to eradicate solid tumors. We believe our autologous T-cell therapies will generate improved, durable clinical outcomes that are potentially curative for patients with solid tumors. We are building a multi-modality product pipeline across several solid tumor indications with high unmet needs.

We are advancing a product pipeline of promising living cell product candidates across multiple ACT modalities that incorporate our Gen-R and Epi-R technology platforms. Each of our programs provide opportunities to expand into additional indications beyond the patient populations we are initially targeting. Our lead product candidates are summarized in the table below:

	TECHNOLOGY	TARGET	COMMERCIAL RIGHTS	INDICATION	PRECLINICAL	PHASE 1	PHASE 2	PHASE 3	NEXT MILESTONE
CAR	Gen-R & Epi-R	ROR-1 (LYL797)	Lyell	• TNBC • NSCLC • Other solid tumors					Begin screening by end of Q1 Initial data expected in 2023
TIL	Epi-R	Polyclonal (LYL845)	Lyell	• Multiple solid tumor histologies					Submit IND in 2H 2022
TCR	Epi-R	NY-ESO-1*	gsk	• Synovial sarcoma • Other solid tumors					Generation of clinical data (GSK run trial)
TCR	Gen-R								Submit IND in late 2022 – early 2023

* Our collaborator, GlaxoSmithKline (GSK), is developing an NY-ESO-1 TCR T cell product candidate, currently in pivotal development. While we are currently evaluating Gen-R and Epi-R in separate programs for this product candidate, together these programs could represent a single future product opportunity for GSK utilizing one or both of our technology platforms.

Our Strategy

Our goal is to utilize our proprietary technology platforms to develop curative ACT for patients with solid tumors.

Key components of our business strategy to achieve this goal include:

- ***Leverage our proprietary, cell reprogramming technology platforms to fundamentally improve T-cell efficacy and eradicate solid tumors.*** — We seek to develop T-cell therapies that eradicate solid tumors by addressing the major barriers to ACT efficacy, including overcoming exhaustion of T cells and creating T cells with properties of durable stemness. Our pipeline of therapeutic candidates includes four programs designed to outlast and eradicate solid tumors utilizing our two lead proprietary T-cell reprogramming technologies: Gen-R and Epi-R.
- ***Rapidly advance our deep multi-modality pipeline of product candidates.*** — Our technology platforms are designed to be applied in a target and modality agnostic manner to CAR, TIL and TCR cell therapies. We believe our autologous T-cell therapies will generate improved, durable clinical outcomes that are potentially curative for

patients with solid tumors. Two INDs for our product candidates have been cleared by the U.S. Food and Drug Administration (FDA), and we anticipate filing two additional INDs by the end of 2022/early 2023.

- ***Continually innovate to develop and advance disruptive, next generation platform technologies for cell-based therapy.*** — We are committed to continuing to discover, develop and advance disruptive technologies that have the potential to revolutionize ACT and its promise to cure patients with solid tumors. For example, we believe our T-cell rejuvenation platform technology may represent the next frontier of epigenetic reprogramming for cell-based therapy.
- ***Maintain proprietary state of the art manufacturing infrastructure and capabilities to control all aspects of cell product preparations.*** — We have and will continue to invest in manufacturing to mitigate the risks the field has seen, including challenges in managing production, supply chain, patient specimen chain of custody and quality control. Controlling manufacturing also enables us to protect proprietary aspects of Gen-R and Epi-R, and rapidly incorporate new innovations. LyFE™, our multi-product manufacturing facility, which can produce plasmid, lentivirus and cells, has been commissioned and qualified in compliance with U.S. Food and Drug Administration's Current Good Manufacturing Practices (cGMP).
- ***Implement digital technologies and cloud solutions to accelerate and enhance our science and operations.*** — High-performance cloud computing, scalable cloud storage, robotic and artificial intelligence, coupled with our collaboration with Amazon Web Services (AWS), enable real time monitoring of our manufacturing process and ability to incorporate deep insights into our research, manufacturing and clinical development efforts. This approach is being leveraged to inform our next generation cell therapies.
- ***Aggressively generate, secure and defend intellectual property on our differentiated technology platforms and product candidates.*** — We have developed and secured intellectual property, including know-how, through our internal research efforts, licensing agreements and collaborations. We rigorously analyze, file and protect our intellectual property.

Our Technology Platforms

ACT has demonstrated profound results in some patients suffering from hematologic tumors, but solid tumors are more complex and have evolved multiple mechanisms to evade and ultimately overcome the immune system. This has limited the use of ACTs in non-hematologic settings. We believe T-cell exhaustion and lack of durable stemness are the two primary barriers limiting the efficacy of ACT in solid tumors.

We have developed two proprietary reprogramming technology platforms to address these two major barriers. Gen-R is designed to overcome loss of T-cell function attributable to an exhausted state, and Epi-R is designed to create T-cell populations with properties of durable stemness. T cells with properties of durable stemness are able to proliferate, persist and self-renew, as well as generate differentiated effector cell progenies to provide durable anti-tumor functionality.

Gen-R *for Overcoming T-Cell Exhaustion.* Gen-R is our proprietary *ex vivo* genetic reprogramming technology to overcome T-cell exhaustion, which results from transcriptional and epigenetic changes that occur as T cells differentiate into a dysfunctional state. Our scientific co-founders discovered T-cell exhaustion occurs more frequently in solid tumors than in hematologic cancers where CAR T cells have demonstrated efficacy. The discovery of Gen-R came from the realization that chronic antigen stimulation, or when the T cell is always "on," combined with an immunosuppressive solid tumor microenvironment (TME), likely promotes the development of T-cell exhaustion. Our scientific co-founder Dr. Crystal Mackall identified a strategy to prevent T cells from becoming exhausted utilizing *ex vivo* genetic reprogramming to overcome the problem of T-cell exhaustion.

Dr. Mackall developed a GD2-targeted CAR T cell that is always turned on and quickly exhausts. This model system drove the CAR T cells to have the hallmark phenotypic, functional, transcriptomic and epigenetic abnormalities described in cancer and chronic viral infections where T cells become exhausted. Compared to normal CD19-targeted CAR T cells that are not always "on," the GD2 CAR T cells demonstrated elevated expression of cell surface exhaustion-associated markers such as PD-1, TIM-3, LAG3 and CD39, and these T cells had decreased function as measured by secretion of IL-2 compared with T cells expressing the CD19 CAR.

All T cell differentiation states, including exhaustion, are characterized by distinct chromatin structure (open versus closed). Generally, open chromatin structures allow for transcription factor binding while closed structures inhibit transcription factor binding. To determine if the GD2 model could enable the understanding of the biology of exhaustion, the GD2 and CD19 CAR T cells were examined for their chromatin structure to evaluate which transcription factor binding sites were accessible in the functional versus the exhausted states. The exhausted GD2 CAR T cells had a genome-wide restructuring of chromatin accessibility compared to the CD19 CAR T cells, and the greatest change was the increased

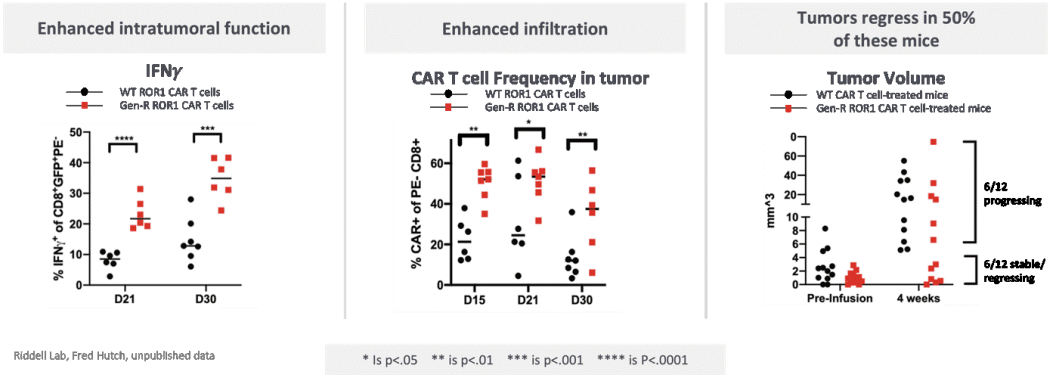
availability of binding sites to the AP-1/ bZIP family and IRF4 transcription factors. These transcription factors include JUNB, JUND, BATF, BATF3, FOSL1, FOSL2 and IRF4.

It is notable that c-JUN, a protein which, when dysregulated, has been shown to play a crucial role in T-cell exhaustion, can bind directly to inhibitory bZIP members, potentially limiting its availability for binding to FOS, which is the necessary AP-1 complex for T-cell effector function. Dr. Mackall evaluated the levels of each of these transcription factors to see whether there were differences between CD19 and GD2 CAR T cells. What was seen was an increase in the level of several of these proteins including JUNB, BATF3 and IRF4 in GD2 CAR T cells compared to CD19 CAR T cells. Furthermore, in the GD2 CAR T cells c-JUN was shown to be complexed with inhibitory factors such as JUNB, IRF4, BATF and BATF3. We believe these data are suggestive of reduced availability of c-JUN to bind to FOS (its activating partner) which is required for T-cell activation.

Dr. Mackall then hypothesized that overexpression of c-JUN in the GD2 CAR T cell, would enable the reconstitution of activating c-JUN/FOS heterodimers and shift the balance to activating versus suppressive protein complexes, and prevent the T cells from becoming exhausted. Indeed, overexpression of c-JUN in the GD2 CAR T cells led to tumor eradication *in vivo* in preclinical models as compared to the mice treated with GD2 CAR T cells that did not overexpress c-JUN.

Our scientific co-founder Dr. Stanley Riddell further tested the hypothesis in a rigorous solid tumor model of non-small cell lung cancer (NSCLC) (Figure 1). He utilized a mouse model that recapitulates the oncogenic driver mutations and immunosuppressive TME of human NSCLC. It has been difficult if not impossible to treat the tumors in these mice with chemotherapy or immunotherapy and this "model" is highly representative of human NSCLC. This model was further designed so that the tumors express ROR1 and, perhaps not surprisingly proved to be resistant to therapy with ROR1 CAR T cells, just as was observed in treating human NSCLC with ROR1 CAR T cells. In contrast, tumor-bearing mice treated with ROR1 CAR T cells that overexpressed c-JUN (Gen-R ROR1 CAR T cells) demonstrated greater infiltration by the T cells into the tumor, enhanced function of those T cells and tumor regression in 50% of the mice, further confirming the results obtained by Dr. Mackall in HER2 and other cancer models. These results are in contrast to the 100% tumor progression observed in mice treated with ROR1 CAR without overexpression of c-JUN. Once again, this model illustrated that when T cells enter solid tumors, they exhaust and become ineffective unless the T cells resist exhaustion with Gen-R.

Figure 1: ROR1 CAR T cell overexpressing c-JUN (Gen-R ROR1 CAR T cells) demonstrated efficacy in mice with NSCLC



Epi-R - ***Reprogramming Cells to Create Durable Stemness.*** Epi-R is our proprietary *ex vivo* epigenetic reprogramming technology to create a novel population of T cells with durable stemness. T cells with properties of durable stemness are able to proliferate, persist and self-renew, as well as generate differentiated effector cell progenies to provide durable anti-tumor functionality.

Emerging research has made clear that effective cellular immunotherapy requires T-cell populations with stem-like characteristics that are capable of both self-renewal and generation of differentiated effector cell progenies to produce clinical responses. The presence of T-cell populations with these attributes correlates with responses to cancer immunotherapy, including TIL ACT and immune checkpoint blockade (ICB) therapy.

We believe *durable* stemness is required for meaningful long-term efficacy against solid tumors. Durable stemness relates to the ability of T cells to maintain their stemness until the tumor is eradicated, that is, they have the ability to proliferate, persist and self-renew, as well as generate differentiated effector cell progenies to provide durable anti-tumor

functionality, despite continued persistent signals from the tumor. We believe that as these cells proliferate, they generate progeny cells that can both differentiate into polyfunctional effector cells, and/or re-populate the population of less differentiated T cell states, thereby maintaining stemness. Epi-R is designed to intentionally and reproducibly generate populations of T cells that have this property of durable stemness. Furthermore, relating specifically to TIL, application of Epi-R has generated T cell preparations that exhibit increased polyclonality, i.e., the retention of a broad repertoire of relevant TCR clonotypes.

We believe our scientists have been able to intentionally and reproducibly produce T cell populations with durable stemness using Epi-R. The resulting Epi-R T cell populations have *in vitro* and preclinical *in vivo* properties that suggest that they are significantly more potent than those generated by standard approaches to manufacturing T cells for ACT. Standard approaches likely generate ill-defined mixes of cells in various states of differentiation, most of which lack the properties to be effective against solid tumors. To be curative, we believe T cells with durable stemness properties are needed.

Our work has built upon the groundbreaking science conducted at the National Cancer Institute (NCI) by the laboratory of Dr. Nick Restifo and then actuated at Lyell by him and his colleagues. We believe that we can reliably produce a population of T cells that have the requisite properties to be effective against tumor cells, that can be characterized by genomic, proteomic and transcriptomic features, and that may ultimately be responsible for clinical effectiveness in ACT. These T cells have enhanced proliferative capacities, as well as the ability to engraft, persist and destroy tumor masses. Our ultimate goal is to characterize, identify, optimize and consistently produce these cells through our proprietary Epi-R technology, which comprises a protocol involving proprietary media, and well-defined cell activation and expansion protocols and customized cytokine combinations. We expect to develop other versions of the protocol in the future to further advance this technology.

Epi-R triggers metabolic pathways that cause T cells to have properties of durable stemness. The origins of Epi-R came from Dr. Restifo's work at the NCI, where he demonstrated that T cells grown in media with high concentrations of potassium were more stem-like and functional. These were the first clues that it might be possible to reprogram cells to be more stem-like and functional. Cells grown with high potassium in the media were 40-100x more potent *in vivo* against established tumors compared with controls and demonstrated significantly enhanced abilities to infiltrate tumors, with tumor-infiltrating T cells exhibiting enhanced resistance to exhaustion as measured by markers such as TIM3. This work demonstrated that the high potassium resulted in changes in the epigenome of the T cells and that this epigenetic reprogramming was likely responsible for the persistence of functional changes in the T-cell population, even after return to standard media or infusion *in vivo*.

Lyell has further advanced and optimized these epigenetic reprogramming strategies to produce the Epi-R T-cell populations with the properties we seek, measured both phenotypically and functionally. We have expanded beyond the work at the NCI on hyperkalemia to execute multivariate, high dimensional experiments that improve upon what was previously published to create Epi-R protocols. Most importantly, in addition to elevated potassium, we have extensively reformulated the media, and optimized cytokines, growth factors, activation methods and other components related to cell culture, activation and expansion. These modifications were required to optimize phenotypic and *in vitro* and *in vivo* functions of the resulting T-cell populations. In addition, we have advanced these research scale efforts and developed clinical scale production capabilities for Epi-R.

Our Epi-R technology allows us to generate T-cell therapy products that retain increased characteristics of stemness that have been clinically linked with effective antitumor immunotherapies. These qualities preserve stemness while also enhancing the functional ability of our cells to recognize and destroy tumor cells, what we term durable stemness. Epi-R fine-tunes the chromatin structure of the T cells, which results in a new transcriptional profiles of T cells to yield a novel cell population that is distinct from those produced by standard expansion processes, with increased expression of a distinct population of cells expressing key genes linked with T cell engraftment, expansion, *in vivo* persistence and function. Trajectory analyses of Epi-R T-cell populations demonstrate that both stem-like and effector populations are maintained in the face of persistent activation, proliferation and multiple cycles of tumor killing, supporting a durable ability to self-renew. As predicted, clinical scale production of Epi-R cells show that they maintain all of these properties, thus addressing one of the challenges in ACT product production – how to maintain functionality of T cells during expansion. Our Epi-R T cell populations have increased durable functionality against tumors *in vitro* and *in vivo*, with increased ability to eradicate established tumors in realistic animal models of human cancer. Applying Epi-R to TIL expansion, we have been able to generate TIL products that exhibit increased polyclonality and retention of key TCR clonotypes in cells grown to clinically meaningful numbers. Our Epi-R TIL are able to effectively recognize and respond to autologous tumor cell lines by secreting key inflammatory cytokines and displaying increased ability to kill cancer on a per-cell basis. In utilizing

Epi-R to create T cells with the qualities associated with clinical antitumor effectiveness, we believe that we have generated an opportunity to eradicate solid cancers.

The Next Frontier: Epigenetic Rejuvenation of T Cells

We believe that Epi-R – the epigenetic reprogramming of T cells to create Epi-R cell populations with durable stemness – holds great potential. New science is emerging that provides insight into additional opportunities to capture the potential of T cells enhanced with the required properties to cure cancer. There are two key cellular parameters as cells develop and differentiate over the life of an organism: cellular identity and age. The decline in function with aging is stereotypical in many cells; it has been well characterized in T cells. Aging of adult stem cells is thought to play a central role in determining the effect of aging on organismal function. Each T cell clonotype can be renewed from a stem cell-like state, but self-renewal, proliferation, function, persistence and antitumor activity are thought to be impacted by aging. We and others have documented the impact of aging on T cell function, which begins to decline after puberty, and at an increasingly accelerated rate after age 65. Morbidity and mortality from cancer also increases with age.

We are therefore working to advance a third platform technology that focuses on rejuvenation of antitumor T cells. The most transformative examples of cell reprogramming have been demonstrated by Shinya Yamanaka, who proved through his Nobel Prize-winning work the ability to reprogram and dedifferentiate somatic cells into induced pluripotent stem cells utilizing four transcription factors (OCT3/4, SOX2, KLF4 and c-MYC; or OSKM), termed the Yamanaka factors. These factors regulate the developmental signaling network necessary for embryonic cell pluripotency. These iPSCs are remarkable in two ways: they are fully de-differentiated and they are rejuvenated to age zero, the age of cells immediately post-fertilization.

Recently, numerous labs have made a leap in cellular reprogramming, called partial reprogramming. By carefully controlling cell exposure to OSKM, scientists have been able to retain the functionality of cells while avoiding the impacts of aging. Rejuvenation can be measured by the reacquisition of youthful properties like enhanced stem cell proliferation and by newly discovered molecular clocks, which measure the intrinsic cellular epigenetic changes associated with aging. These intrinsic ‘clocks’ can be measured by DNA methylation patterns. We have early data for the first time with T cells illustrating the ability to “turn back” the epigenetic clock in a process called cell rejuvenation, without changing the cell’s identity as would occur in de-differentiation. This cell rejuvenation process utilizes transient expression of OSKM, and/or other reprogramming factors.

Our data illustrates that when we express the reprogramming factors in a T-cell population for a prolonged amount of time, T cells lose their identity and start to acquire markers associated with mesenchymal and embryonic stem cells. During this process, cells acquire the expression of stage-specific embryonic antigen-4 (SSEA-4) and begin to attach to the cell culture substrate. We are developing a method to revert the initial changes caused by reprogramming to maintain T-cell identity while reducing the epigenetic age of the cells. This technology is currently in the research stage.

Targeting Cancer Cells: ACT Modalities and Their Limited Efficacy Against Solid Tumors to Date

Most of the activity in ACT for cancer has focused on ways to provide the requisite specificity of the T cells to cancer: identifying appropriate tumor-specific targets, evaluating their frequency on cancers versus healthy tissues and evaluating the best ways to traffic immune cells to them and attack the cancer. There are three main modalities to achieve target specificity in ACT today: CARs, TCRs and TILs, and, unfortunately, with very few exceptions, they have not meaningfully improved clinical outcomes in patients suffering from solid tumor cancers.

- ***CARs***: Chimeric antigen receptors are artificial cell surface receptors that are genetically engineered into T cells and comprise a chimeric protein that contains an extracellular binding domain specific to a surface molecule on tumor cells linked to an intracellular activation domain that turns the T cells “on” to kill target tumor cells when the antibody portion binds to the tumor cell target.

  CAR-based ACT has shown efficacy in some cancers, including durable complete remissions. The greatest clinical benefit has been demonstrated in B cell malignancies where the adoptive transfer of autologous T cells engineered with a CAR targeting CD19 has been shown to induce complete remission in 40 – 90% of patients resulting in the approval of five CD19 CAR T cell therapies. However, CAR T cells have thus far demonstrated limited efficacy in solid tumors. Furthermore, the identification of targets with sufficient differential expression between tumor and normal tissues has limited the broader development of CAR T-cell therapies in solid tumors.

- ***TILs***: Tumor infiltrating lymphocytes are T cells that have entered and reside within the tumor. They are polyclonal in nature, i.e., they are able to recognize multiple tumor neoantigens. A TIL-based ACT approach isolates and expands TILs from tumor masses and reinfuses the expanded cells into the patient. The polyclonality of TILs is a major advantage to address the heterogeneity and antigen loss challenges of solid tumors. The risk of normal tissue toxicity is mitigated because the targets for these T cells are directed against neoantigens that arise from the accumulation of mutations in genes unique to the cancer.

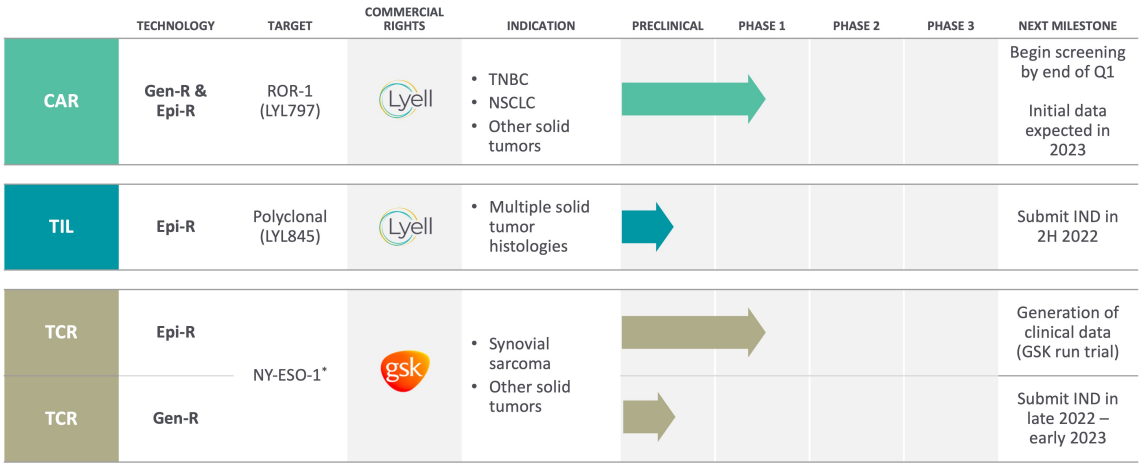
  While a handful of clinical trials, primarily academic, have demonstrated TILs may generate durable responses in certain tumor types such as melanoma, they have shown limited efficacy in patients with other prevalent solid tumor cancers. Regardless, most patients treated with TIL therapy do not respond to treatment, and most patients who do respond eventually relapse.

- ***TCRs***: T cell receptors are directed against fragments of intracellular proteins that are presented by the human leukocyte antigen (HLA) complex on the surface of target cells. T cells can be engineered with a cloned TCR that mono-specifically directs the T cell to recognize a neoantigen that arises from the tumor's mutated proteins or to recognize an aberrant or overexpressed self-protein. TCRs specific for neoantigens have the advantage of being tumor specific, meaning that normal tissues do not express these neoantigens thereby reducing the risk of normal tissue toxicity.

  TCR-based ACT has been utilized clinically to treat a limited number of cancers. Although there has been some clinical success in treating cancer patients with TCR-engineered T cell products, most patients infused with these cells do not experience durable, complete responses to therapy.

Our Programs

We are advancing a product pipeline of promising living cell product candidates across multiple ACT modalities that incorporate our Gen-R and Epi-R technology platforms. Each of our programs provide opportunities to expand into additional indications beyond the patient populations we are initially targeting. Our lead product candidates are summarized in the table below:



* Our collaborator, GlaxoSmithKline (GSK), is developing an NY-ESO-1 TCR T cell product candidate, currently in pivotal development. While we are currently evaluating Gen-R and Epi-R in separate programs for this product candidate, together these programs could represent a single future product opportunity for GSK utilizing one or both of our technology platforms.

LYL797: Our ROR1 Targeted CAR T-Cell Product Candidate for the Treatment of Multiple Solid Tumor Indications

We are applying our Gen-R and Epi-R technology platforms to our lead CAR T-cell product candidate, LYL797, which is expected to be an IV administered CAR T-cell product targeting receptor tyrosine kinase-like orphan receptor 1 (ROR1). LYL797 contains a CAR with a 4-1BB/CD3z co-stimulatory domain, an optimized spacer and a single-chain variable fragment (scFy) derived from an R12 rabbit monoclonal antibody that recognizes and binds with high specificity to human ROR1. LYL797 also incorporates Gen-R and a proprietary optimized version of human EGFR ($EGFR_{opt}$) used

for tracking of the CAR T cells in the peripheral blood. LYL797 is manufactured utilizing our proprietary Epi-R technology.

We are initially developing LYL797 for the treatment of ROR1$^+$ triple-negative breast cancer (TNBC) and NSCLC. ROR1 expression is associated with poor prognosis. Significant subsets of patients with common cancers express ROR1, including TNBC (~60%) and NSCLC (~40%), two of the highest ROR1 expressing indications. If successful, we anticipate expanding into other ROR1$^+$ cancers with a lower incidence of ROR1 expression, including potentially HR$^+$ breast cancer, ovarian and other solid tumors.

In December 2021 we announced FDA clearance of our Investigational New Drug (IND) application for LYL797. With the opening of a clinical trial site in March 2022, we have initiated our Phase 1 clinical trial designed to evaluate the safety and anti-tumor activity of LYL797 in patients with ROR1+ TNBC or NSCLC. We plan to share initial data from the trial when we have a meaningful number of patients and an indication of clinical effect, which we expect to occur in 2023.

Rationale for ROR1

We have selected ROR1 as our initial target because it is highly expressed in certain solid tumor types and clinical data has been generated using ROR1 CAR T cells that demonstrate exhaustion and thus serve as a good vehicle to test our Gen-R technology. Data from multiple third-party clinical trials of ROR1 targeted therapies in hematologic and solid tumor cancers suggest that targeting ROR1 was well tolerated at active dose levels with no on-target, off-tumor toxicity observed despite ROR1 expression in a number of normal tissues.

Target Indications

Patients with solid tumors, including TNBC, NSCLC, ovarian cancer or HR+ breast cancer, often face a poor prognosis and low rates of long-term survival. Although patients may benefit initially from radiation therapy, chemotherapy, surgery and more advanced alternatives such as ICB, immunotherapies or targeted therapies, most patients eventually relapse. After becoming resistant to initial lines of therapy, patients are limited to palliative care, experimental therapies in clinical trials or chemotherapy regimens that are often highly toxic and largely ineffective. Patients are further challenged by high rates of late-stage diagnosis, when tumors have metastasized. Despite recent advances in therapeutic development, for most patients diagnosed with solid tumors, a significant unmet medical need exists and long-term survival rates remain low.

ROR1 has been reported to be expressed in many other solid tumors beyond breast, lung and ovarian, including prostate, stomach, endometrial and pancreatic, providing multiple opportunities for indication expansion. Many of these indications are unaddressed or under-addressed with currently approved therapeutics; further, patients with ROR1 expression tend to experience poorer outcomes on these treatments and poorer prognosis. These indications represent a significant unmet need and a substantial opportunity.

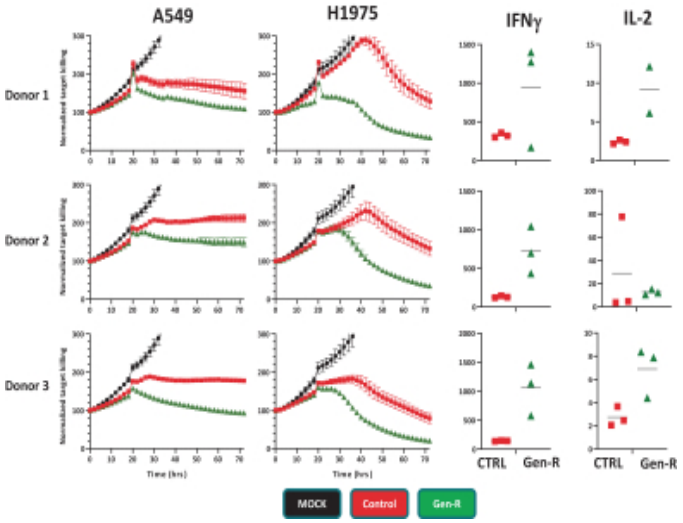
Preclinical Data

We have conducted a number of preclinical *in vitro* and *in vivo* experiments of LYL797 against ROR1$^+$ solid tumors. These studies have demonstrated that LYL797, which incorporates Gen-R and Epi-R, maintains stem-like phenotypes and can resist exhaustion while inhibiting tumor growth in models of tumor cells expressing ROR1.

Gen-R and Epi-R, in combination with ROR1-targeted CAR T cells, have been evaluated preclinically in *in vitro* and *in vivo* models. In the studies depicted below, we exposed ROR1 + Gen-R CAR T cells (ROR-1 + Gen-R) and other ROR1 CAR T cells without Gen-R (the Control) to chronic stimulation by repeated exposure to ROR1$^+$ NSCLC tumor cells, with fresh tumor cells introduced every two days. After seven days of chronic stimulation, we assessed cytolytic ability and cytokine release from the T cells. In all donors, the ROR1 + Gen-R T cells demonstrated improved maintenance of cytotoxicity against ROR1$^+$ tumor cells while producing increased levels of cytotoxic cytokines, such as IFNɣ. This suggests persistence of activity and thus lack of exhaustion in ROR1 + Gen-R versus the Control T cells (Figure 2).

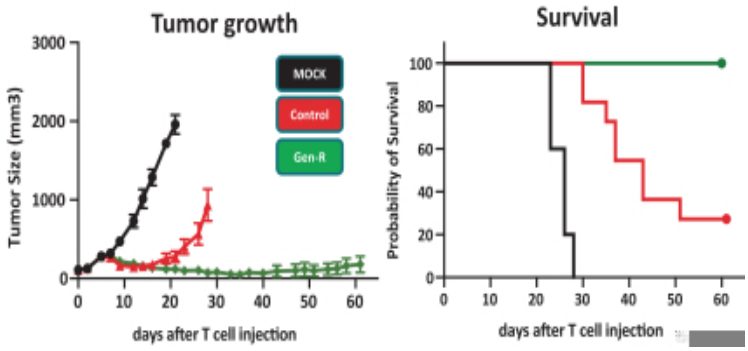
Figure 2: In vitro *experiment demonstrated superior ability of ROR1 + Gen-R T cells to resist T cell exhaustion. In this experiment we repeatedly stimulated T cells from three different donors with ROR1$^+$ lung cancer cells (cell lines A549 and H1975). After four rounds of stimulation over seven days, we tracked tumor killing kinetics by measuring reduction of tumor cells over time. Shown here are results comparing ROR1 + Gen-R T cells (Gen-R, in green), to the Control T cells (the Control, in red), and to T cells without a ROR1 CAR (Mock, in black). In both the left and middle columns (against two lung tumor cancer cell lines—A549 and H1795), the green line is below the red and black lines, indicating that more*

tumor killing occurred with ROR1 + Gen-R T cells. In addition, as shown in the right panel, at 24 hours after the fourth round of stimulation, the ROR1 + Gen-R T cells produced more of the killing-associated cytokines IFNɣ and IL-2.



In *in vivo* experiments the ROR1 + Gen-R T cells achieved superior tumor growth inhibition relative to the Control in murine models of ROR1$^+$ lung cancer. Importantly, as shown in the figure below, the Control T cells were administered at a sub-therapeutic dose and did not result in complete tumor eradication, while the ROR1 + Gen-R T cells, when administered intravenously at the same dose, demonstrated near complete inhibition of tumor growth.

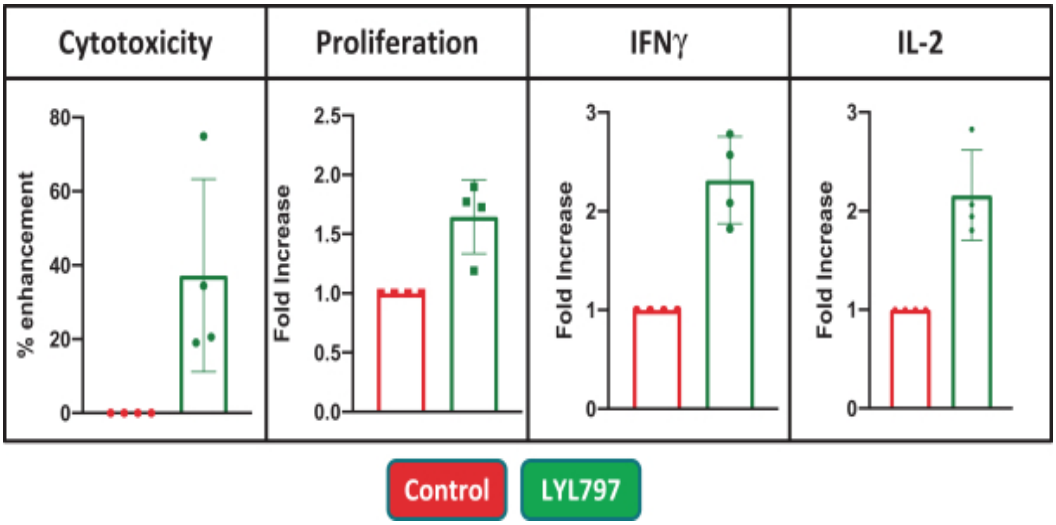
Figure 3: In vivo *study demonstrated inhibition of tumor using ROR1 + Gen-R T cells. In this study, tumor cells from a human ROR1$^+$ lung cancer cell line were implanted into NSG mice. When tumors reached 100mm3, the mice were intravenously injected with ROR1 + Gen-R T cells (Gen-R, in green), the Control T cells (the Control, in red) or T cells without a ROR1 CAR (Mock, in black). The left panel shows results from tracking tumor growth. The black and red lines, Mock and the Control, go up over time, while the green line at the bottom, ROR1 + Gen-R, is nearly flat. At the end of the study (60 days post T cell injection) all of the mice treated with ROR1 + Gen-R T cells were alive and had no meaningful change in body weight.*



Additional *in vitro* experiments demonstrate synergistic improvement of CAR T cells by implementing Epi-R in addition to Gen-R (LYL797). When repeatedly exposed to ROR1$^+$ NSCLC tumor cells, with fresh tumor cells introduced every three days, LYL797 showed increases in cytotoxicity, proliferation and secretion of cytokines compared to ROR1 + Gen-R, across all donors.

Figure 4: In vitro*, application of Epi-R technology resulted in better functional activity of ROR1 + Gen-R T cells. LYL797 T cells (LYL797, in green) and ROR1 + Gen-R T cells (the Control, in red) were repeatedly stimulated every three days with tumor cells from a ROR1$^+$ lung cancer cell line (A549). During the final stimulation, we measured the percent*

enhancement in tumor cell clearance (cytotoxicity) or the fold increase in proliferation and 24 hour cytokine production of LYL797 T cells compared to ROR1 + Gen-R T cells. Data from four donors is shown. LYL797 T cells showed increases in cytotoxicity, proliferation and secretion of cytokines compared to ROR1 + Gen-R T cells.



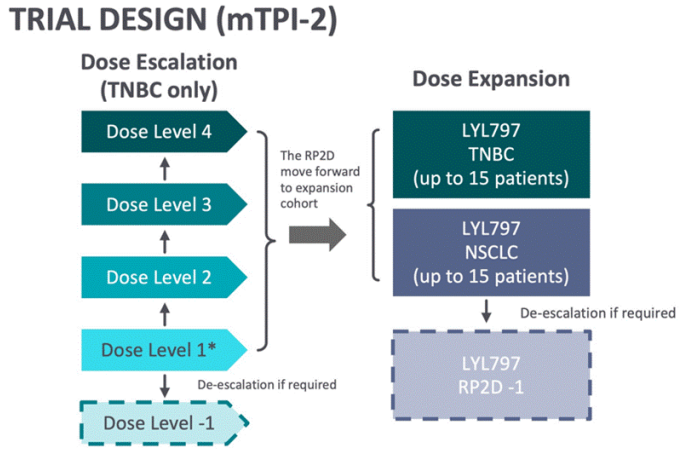
Our Phase 1 Trial

Our Phase 1 clinical trial is designed to evaluate the safety and anti-tumor activity of LYL797 in patients with ROR1+ TNBC or NSCLC.

The trial is designed as an open label, dose escalation and expansion trial in patients with relapsed/refractory TNBC or NSCLC who have failed at least two lines of therapy. Once a dose is identified during dose escalation in TNBC, 15 patients with TNBC and 15 patients with NSCLC are expected to be enrolled at the recommended dose. The primary endpoint is safety and tolerability of LYL797. Secondary endpoints include clinical activity based on the evaluation of antitumor activity as evaluated by Response Evaluation Criteria in Solid Tumors (RECIST) criteria and characterization of the pharmacokinetic profile of LYL797. Exploratory biomarkers of T cell function – exhaustion and stemness – will also be assessed.

Patients will be monitored for cytokine release syndrome (CRS) and immune effector cell-associated neurotoxicity syndrome (ICANS), as well as tissue specific toxicities in ROR1-expressing organs. As a safety measure, we have included our EGFRopt safety switch in our construct. Thus, cetuximab may be used as a safety intervention, if indicated.

Figure 5: LYL797 Phase 1 trial design



Abbreviations: mTPI-2, modified toxicity probability interval 2; NSCLC, non-small-cell lung cancer; ROR1, receptor tyrosine kinase–like orphan receptor 1; TNBC, triple-negative breast cancer; RP2D, recommended Phase 2 dose

LYL845: Our TIL Product Candidate Targeting Multiple Solid Tumor Indications

We are applying our Epi-R technology to develop our product candidate, LYL845, which is expected to be an IV administered autologous TIL therapy in multiple solid tumors. TILs have previously shown clinical benefit in patients with melanoma and other solid tumors with high mutation burdens. Published data from third-party TIL trials show that treating metastatic melanoma patients with TILs results in a 50% or greater response rate, with up to half of those responses complete and durable. TIL therapy has also been shown to result in responses in patients with advanced cervical, lung, breast and gastrointestinal cancers, although response rates in these tumor histologies are much lower than that observed in the melanoma setting. TILs target a variety of tumor antigens, but it is thought that the clinical efficacy of TILs is largely driven by specific recognition of mutated tumor neoantigens. Further, broad TIL efficacy has been limited by poor enrichment of tumor-reactive T cells, poor quality and growth potential of expanded T cells, and failure to maintain polyclonality of TILs during production. We have designed LYL845 to incorporate our Epi-R technology that has shown promising improvements in enhancing T cell potency, antitumor activity and increased polyclonality of TILs. We expect to submit an IND to the FDA in the second half of 2022 for LYL845.

Target Indications

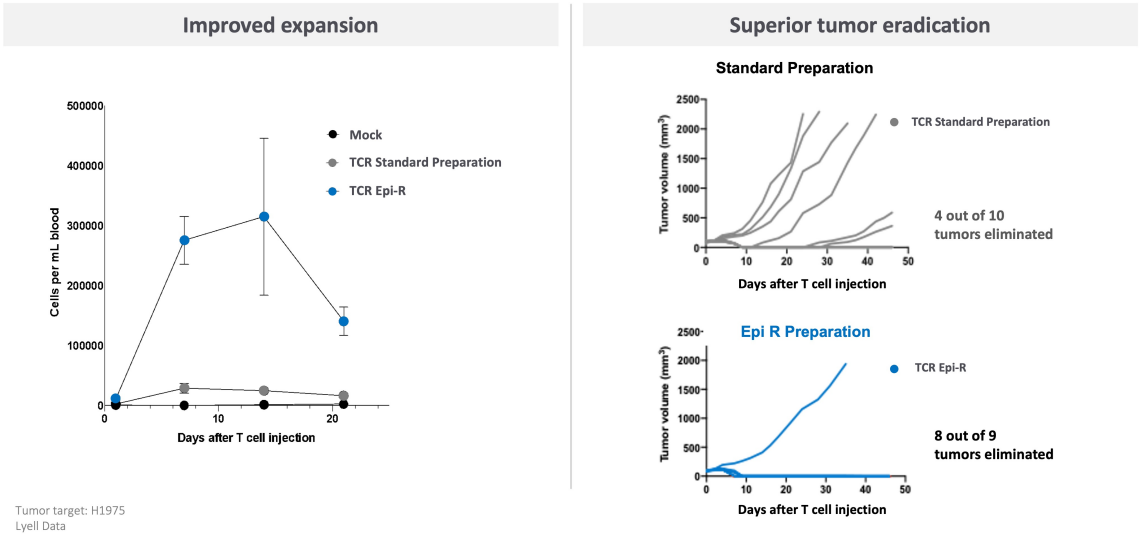
We are initially targeting melanoma, and also plan to include patients with other solid tumors, potentially including NSCLC, colon, head and neck, cervical, breast and pancreatic, which all have a high unmet need based on the current treatment landscapes. Although patients may benefit initially from radiation therapy, chemotherapy, surgery and more advanced alternatives such as checkpoint therapies, immunotherapies or targeted therapies, most patients with these types of cancers eventually relapse. After becoming resistant to initial lines of therapy, patients are limited to palliative care, experimental therapies in clinical trials or chemotherapy regimens that are often highly toxic and largely ineffective. Overall, despite recent advances in therapeutic development, for most patients diagnosed with solid tumors, a significant unmet medical need exists and long-term survival rates remain low.

Our Preclinical Data

We have conducted a number of preclinical *in vitro* and *in vivo* studies supporting the development of LYL845 that suggest TILs enhanced with Epi-R maintain properties of durable stemness, including superior expansion and tumor eradication in both animal studies and autologous experiments, as well as polyclonality.

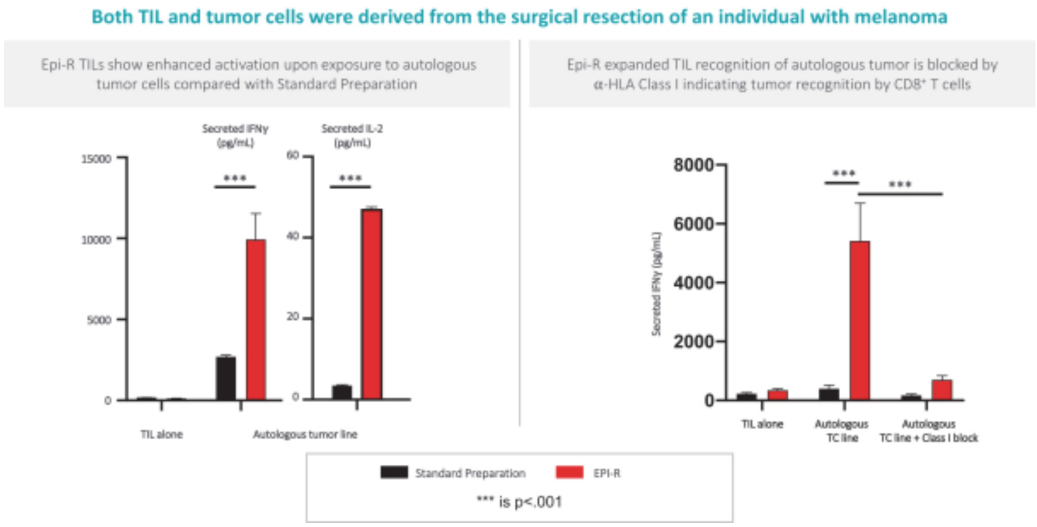
Our Epi-R T cell populations have demonstrated superior expansion in *in vivo* mouse models. We measured the number of T cells in the mice at various time points and observed as many as 50-fold more T cells in mice injected with Epi-R T cells, as compared to mice injected with T cells expanded in Standard Preparation. We also observed, after 40 days, tumor eradication in 8 out of 9 mice treated with Epi-R T cells versus eradication in only 4 out of 10 mice treated with Standard Preparation. Standard Preparation, as used throughout this document refers to a typical cell preparation that includes TransAct beads, OpTmizer media and IL-2, IL-7 and IL-15 cytokines.

Figure 6: Epi-R T cells had improved expansion in vivo *as shown in the left panel and had greatly improved antitumor function in mouse models of cancer, as shown on the right. Epi-R T cells eliminated tumors in 8 out of 9 treated mice (note overlapping blue lines in Epi-R tumor killing along the x-axis), compared to 4 out of 10 mice treated with Standard Preparation T cells.*



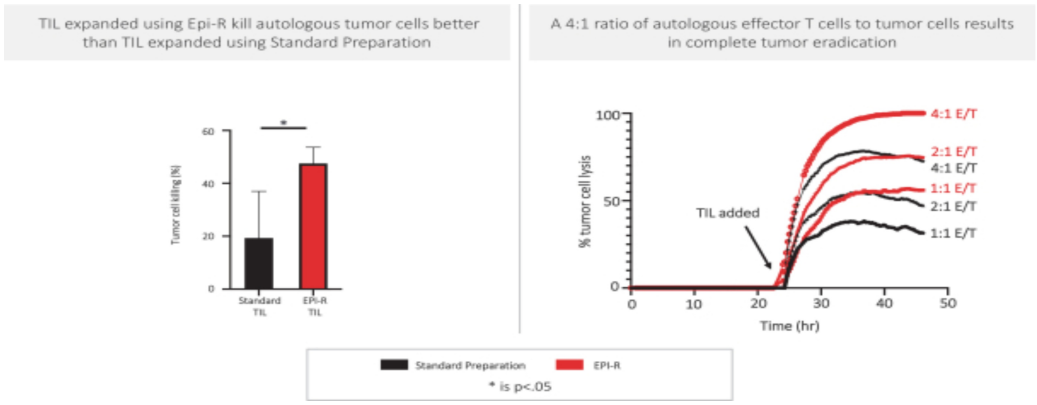
In *in vitro* studies we evaluated Epi-R expanded TIL recognition of autologous melanoma cancer cells. Utilizing a patient melanoma tumor excision, we both extracted and expanded TIL from that specimen in either Standard Preparation or Epi-R, and created a cancer cell line in order to evaluate whether the expanded TIL from that tumor recognize and react to that patient's own cancer cells. We were able to demonstrate that Epi-R TIL do exhibit enhanced activation, the response is mediated by activated killer $CD8^+$ cells, and they have significantly enhanced tumor cell killing capacity when compared to Standard Preparation. The higher secretion of IL-2, the critical T cell growth factor, is notable.

Figure 7: Epi-R TIL had enhanced recognition and activity against autologous melanoma tumor cell line. Asterisks denote significant p-values between groups. The red bars in the graph on the left show that Epi-R T cells from TIL secreted increased levels of IFNɣ and IL-2 cytokines as compared to Standard Preparation after co-culture with autologous melanoma tumor cells, indicating greater activation and cytotoxicity potential. As a control, when TIL alone were measured without the presence of autologous tumor cells, they did not activate and did not secrete the cytokines. In the bar chart on the right, we demonstrate that production of IFNɣ secretion dropped significantly when target cells were coated with an antibody to HLA Class I, indicating that the tumor cell recognition was mediated by $CD8^+$ T cells.



These cells were also shown to be more effective at tumor cell killing. In the graph below on the left, we show that Epi-R TIL killed autologous tumor cells at a rate of approximately 50% whereas those TIL grown in Standard Preparation killed at a rate of approximately 20%. We also observed, in an experiment to titrate different levels of Epi-R TIL against tumor cells, that a 4:1 effector T cell to tumor cell ratio resulted in complete tumor eradication.

Figure 8: Epi-R TIL had improved ability to kill autologous tumor cells. Standard and Epi-R TIL were co-cultured with autologous melanoma tumor cells and their ability to kill tumor was measured after 24 hours (left panel). Altering the ratio of TIL:tumor cells (E/T ratio) can impact TIL ability to kill tumor. Epi-R TIL exhibited increased tumor killing at all E/T ratios, and at a 4:1 ratio Epi-R TIL successfully killed all tumor cells.



Epi-R has also demonstrated the ability to preserve the polyclonality of TIL preparations, one of the key advantages of this ACT modality.

Quantitatively, polyclonality can be measured by the Simpson Clonality index. The Simpson Clonality Index is a quantitative tool that reflects diversity within a dataset; a low number represents high diversity, while a high number represents low diversity. An index value of 1 would represent a monoclonal population. The Simpson Clonality Index of TIL in the tumor is very low, demonstrating high clonal diversity of the original TILs. In Standard Preparation, the majority of clones giving rise to the desired clonal diversity are lost upon stimulation and expansion as shown by the high Simpson Clonality Index. In contrast, most of the original tumor clonal diversity is maintained in TIL expanded with Epi-R, as shown with a low index score.

It is known that T cells migrating through tissues experience arrested migration upon recognition of their target tumor antigen, resulting in their activation and expansion, which is followed by their exhaustion. We quantified the TCRs

from TILs and ranked them by the frequency of the clonotypes found. We compared the frequencies of individual TCRs after expansion in Standard Preparation or Epi-R conditions. On the right in the graph below, we show that Epi-R preserved dominant TIL clonotypes found amplified in the tumor; 57% of the TCR Vß sequences corresponded to the top 50 TCRs represented in the original TIL. By sharp contrast, only 2% of the TCR clonotypes expanded in Standard Preparation were represented in the top 50 TCRs found in TIL.

Figure 9: Epi-R TIL exhibited increased T cell polyclonality in multiple tumor types as measured by the Simpson Clonality Index (a measure of polyclonality, with high Simpson values indicating low polyclonality). Epi-R TIL exhibited a low Simpson Clonality Index that reflects increased diversity of T-cell TCR repertoire.

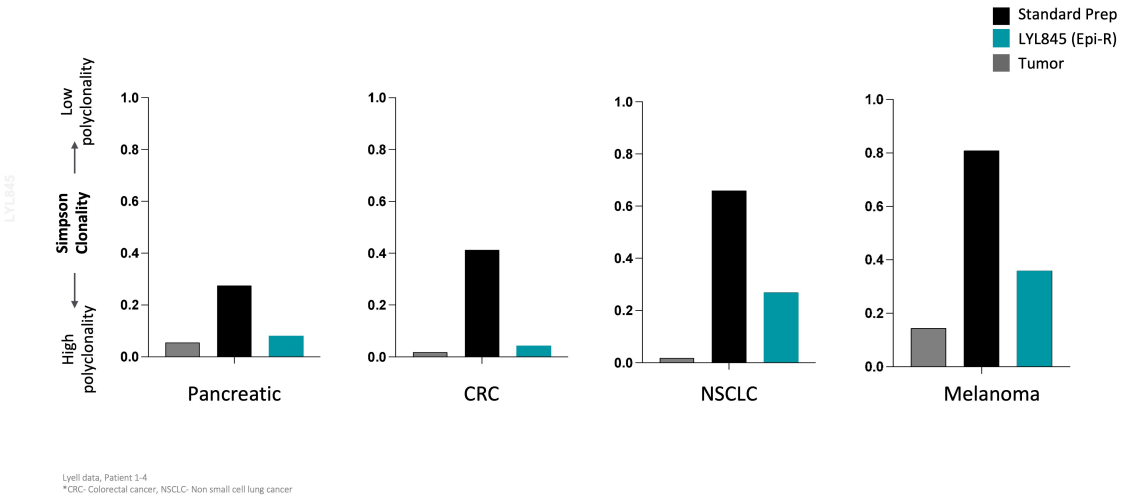
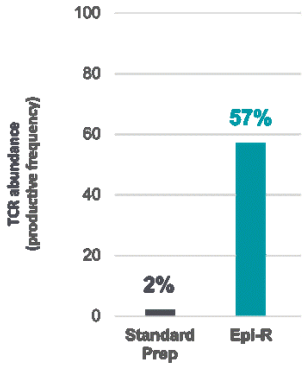


Figure 10: Epi-R TIL also exhibited retention of original dominant T cell clones. TCR sequencing was performed on Standard Preparation and Epi-R TIL. The relative abundance of TCRs that were observed in starting tumor T cell population was compared with Standard Preparation and Epi-R expanded TILs. Epi-R TILs retained greater proportions of starting TCR repertoire after expansion. Of the top 50 dominant tumor TCRs, 57% are represented in the Epi-R expanded product vs 2% in the Standard Preparation.

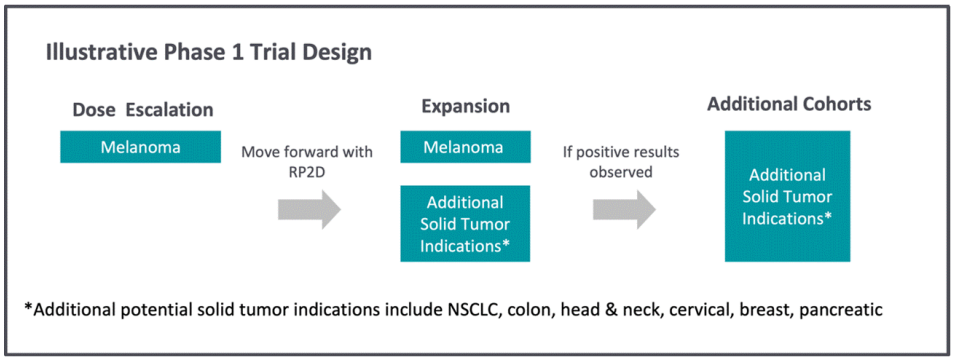


Our Planned IND Submission and Phase 1 Trial

We plan to submit an IND for LYL845 to the FDA in the second half of 2022. We are planning our Phase 1 clinical trial as a dose escalation and expansion study of LYL845 in multiple solid tumor indications. The primary endpoint of our Phase 1 trial is expected to be the safety and tolerability of LYL854. We are initially targeting melanoma, and also plan to include patients with other solid tumors, potentially including NSCLC, colon, head and neck, cervical, breast and pancreatic.

We plan to monitor patients for CRS and auto-immunity. We plan to monitor clinical efficacy based on antitumor activity as evaluated by RECIST criteria and characterization of the pharmacokinetic profile of LYL845.

Figure 11: LYL845 Phase 1 Trial



NY-ESO-1 TCR: Our Lead Program with GSK

Our collaborator, GSK, is developing an NY-ESO-1 TCR T cell product candidate, NY-ESO-1^{c259}, currently in pivotal development. Our collaboration explores the potential enhancement of that product candidate though the application of our Gen-R and Epi-R platform technologies, with a goal to improve the depth and durability of clinical responses. While we are currently evaluating Gen-R and Epi-R in separate preclinical and clinical programs, together these programs could represent a single future product opportunity for GSK utilizing one or both of our platform technologies.

We are responsible for preclinical activities for both programs and GSK is responsible for executing the clinical trials and commercialization, if approved, of a future product. We anticipate that initial clinical trials will be conducted in synovial sarcoma (SS) and myxoid/round cell liposarcoma (MRCLS). Positive results from the initial patient cohorts could support additional combinations and expansions into additional NY-ESO-1+ tumor types, including those with lower levels of target antigen, such as NSCLC.

In January 2022, we announced FDA clearance of our IND for LYL132 (NY-ESO-1 + Epi-R). The planned Phase 1 trial is designed to assess LYL132 in patients with NY-ESO-1+ advanced SS or myxoid/round cell liposarcoma (MRCLS). Lyell holds the product IND and will manufacture LYL132 in its LyFE™ Manufacturing Center and GSK will conduct the Phase 1 trial.

GSK has communicated to us that due to updated manufacturing timing, the IND submission to the FDA for NY-ESO-1 + Gen-R is likely to be in late 2022/early 2023.

Rationale for NY-ESO-1

NY-ESO-1 is a known cancer testis antigen target that has been previously validated in clinical trials. It is expressed in a wide range of solid tumors, including at high levels in some indications; however, it has low or no expression in healthy adult tissues. It is expressed in approximately 80% of SS, neuroblastomas and MRCLS, more than 40% of melanomas and ovarian cancers, and between 20% to 40% of multiple other cancers including bladder, esophageal, hepatocellular, head and neck, ovarian, prostate, myeloma, breast and NSCLC. Patients who could benefit from treatment with NY-ESO-1-targeted therapies are further limited because the NY-ESO-1-antigen is HLA A2-restricted and the therapeutic T cells recognize only certain protein sequences.

Target Indications

We are initially targeting SS, MRCLS and NSCLC, which all have a high unmet need based on the current treatment landscapes. SS and MRCLS, in particular, have limited treatment alternatives, and are largely treated with a combination of surgery and chemotherapy, but with significant rates of metastases and low 5-year survival rates in metastatic cases. While NSCLC has more treatment alternatives, it still has low five-year survival rates and due to its prevalence causes upwards of 130,000 deaths in the United States per year. In addition to the unmet need in these cancers, NY-ESO-1 expression is high in all three, 80+% in MRCLRS and SS as well as up to 25% in NSCLC, further supporting our development plans.

Preclinical Data

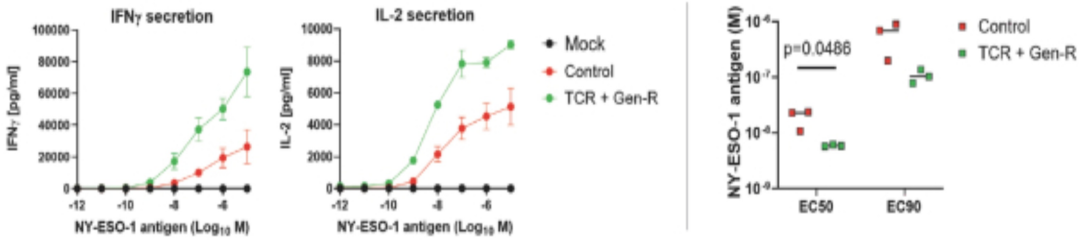
We have separately tested both platform technologies with GSK's NY-ESO-1 TCR. We are currently conducting preclinical studies for NY-ESO-1 TCR with Gen-R (NY-ESO-1 + Gen-R) and NY-ESO-1 TCR with Epi-R (NY-ESO-1 + Epi-R), compared to GSK's baseline NY-ESO-1 TCR (the Control).

Preclinical *in vitro* and *in vivo* experiments of NY-ESO-1 + Epi-R (LYL132) have demonstrated that LYL132 has T cells with qualities consistent with T-cell stemness, including enhanced metabolic fitness and proliferation. We believe these qualities could be associated with improved clinical responses that could further improve first generation approaches.

We have conducted a series of *in vitro* and *in vivo* experiments that show NY-ESO-1 + Gen-R T cells resisted exhaustion and had increased production of cytokines associated with tumor killing, improved sensitivity to lower levels of NY-ESO-1 surface expression and improved tumor cell killing compared to the Control, both initially and after persistent exposure to NY-ESO-1$^+$ tumor cells. We believe these findings could translate into improved outcomes in the clinical setting.

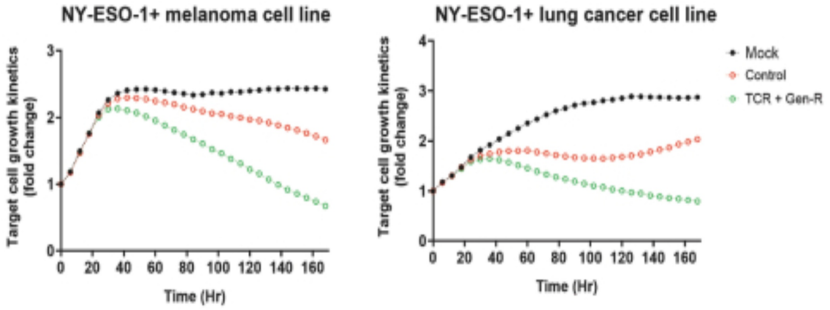
We exposed NY-ESO-1 + Gen-R T cells to NY-ESO-1$^+$ solid tumor cell lines and measured IFNɣ and IL-2, cytokines associated with tumor killing. We observed a more than two-fold increase in secretion of those cytokines with NY-ESO-1 + Gen-R compared to the Control in two of three donors. We also exposed T cells to increasing concentrations of NY-ESO-1 on solid tumor cells and showed that NY-ESO-1 + Gen-R were significantly more sensitive than the Control to low levels of NY-ESO-1 (Figure 12).

Figure 12: In vitro *experiments showed that NY-ESO-1 + Gen-R had increased antitumor cytokines (left panel) and increased antigen sensitivity (right panel) compared to the Control. In the experiment on the left, T cells were exposed to NY-ESO-1$^+$ tumor cells and IFNɣ and IL-2 production were measured. The figure shows that NY- ESO- 1 + Gen-R (TCR + Gen-R, green curves) produced higher and increasing amounts of those cytokines compared to the Control (red curves). In the experiment on the right, T cells were exposed to increasing concentrations of NY-ESO-1 peptide presented by T2 cells, where EC50 and EC90 are measures of maximal antigen concentration needed for response. The right panel shows that NY-ESO-1 + Gen-R (green dots) were more sensitive to low levels of NY-ESO-1 compared to the Control (red dots). Mock T cells, without NY-ESO-1 TCR or Gen-R, are shown in the black curves. Results for EC50 were significant, with p values between groups shown.*



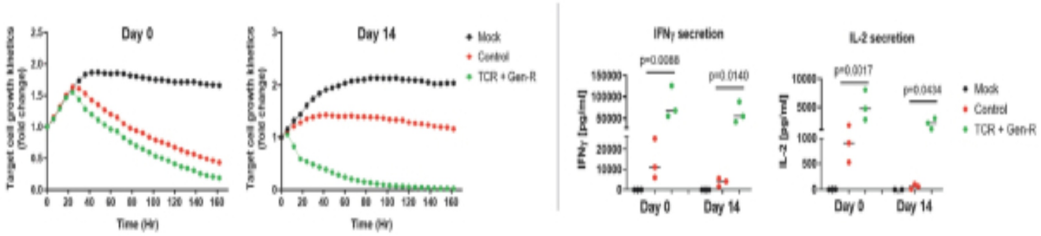
Additionally, NY-ESO-1 + Gen-R T cells demonstrated a stronger, faster and sustained durability to kill solid tumor cells versus the Control (Figure 13). This result was observed across five donors and two NY-ESO-1+ solid tumor cell lines.

Figure 13: NY-ESO-1 + Gen-R T cells (TCR + Gen-R, green curves) demonstrated superior ability to kill NY-ESO-1$^+$ solid tumor cells compared to the Control. The figure shows T cell killing efficiency against two different NY-ESO-1$^+$ cell lines, measured by tracking kinetics of tumor cell clearance over time. The green curves illustrate the clearance of tumor cells by the NY-ESO-1 + Gen-R; the red curves illustrate the same for the Control. Mock T cells, without NY-ESO-1 TCR or Gen-R, are shown in the black curves. In the right panel, the red curve goes upward over time as the TCR T cells without Gen-R lost their antitumor activity, while the green curve goes downward, showing that NY-ESO-1 + Gen-R T cells maintained their antitumor activity. Experiment performed with five donors; representative donor shown.



To test for T cell exhaustion, we exposed NY-ESO-1 + Gen-R to NY-ESO-1^{+} solid tumor cells repetitively. After persistent antigen exposure, NY-ESO-1 + Gen-R continued to kill NY-ESO-1^{+} tumor cells and secrete cytokines associated with tumor killing, while the Control T cells lost this ability (Figure 14). In addition, a significantly lower proportion of NY-ESO-1 + Gen-R expressed markers of exhaustion. These results suggest that NY-ESO-1 + Gen-R T cells resisted exhaustion after persistent antigen exposure compared to the Control.

Figure 14: NY-ESO-1 + Gen-R T cells (TCR + Gen-R, green line) showed enhanced long-term tumor killing activity. In a serial re-stimulation assay, where the T cells were exposed to fresh NY-ESO-1^{+} tumor cells four times, NY-ESO-1 + Gen-R T cells maintained the ability to kill NY-ESO-1^{+} tumor cells and to secrete cytokines over time, whereas the Control cells (red line) exhibited signs of exhaustion, as illustrated by loss of killing activity and cytokine secretion. The green curves in the left panel and the green dots in the right panel show that the NY-ESO-1 + Gen-R T cells were able to kill NY-ESO-1^{+} tumor cells and secrete high amounts of cytokines before (Day 0) and after (Day 14) four rounds of NY-ESO-1 antigen exposure, whereas the Control T cells showed signs of exhaustion, as illustrated by loss of ability to kill and secrete cytokines (red curves and red dots). Mock T cells, without NY-ESO-1 TCR or Gen-R, are shown in the black curves. Significant p values between groups are shown.



Our Manufacturing Capabilities

We believe it is critically important to own, control and continuously monitor all aspects of the cell therapy manufacturing process in order to mitigate risks the field has seen, including challenges in managing production, supply chain, patient specimen chain of custody and quality control. We made a strategic decision to invest in building our own manufacturing facility to control our supply chain, maximize efficiencies in cell product production time, cost and quality, and have the ability to rapidly incorporate disruptive advancements and new innovations. Controlling manufacturing also enables us to protect proprietary aspects of our Gen-R and Epi-R technology platforms. We view our manufacturing team and capabilities as a significant competitive advantage.

Our LyFE manufacturing center is approximately 73,000 square feet and comprises laboratories, offices and manufacturing suites. LyFE has a flexible and modular design allowing us to produce plasmid, viral vector and T cell product to control and de-risk the sequence and timing of production of the major components of our supply chain related to our product candidates. At full staffing and capacity, we expect to be able to manufacture approximately 500 infusions per year depending on product candidate mix. At this time, we believe this capacity is sufficient to support our pipeline programs through pivotal trials and, if approved, early commercialization.

Since becoming operational in April 2021, the LyFE manufacturing center has completed successful engineering runs at scale in support of our current and planned clinical trials.

In December 2021, we announced that LyFE is commissioned and qualified in compliance with the FDA's cGMP requirements. LyFE is designed to produce cell products at scale for our current and planned clinical trials across our CAR, TIL and TCR programs.

Competition

The pharmaceutical industry is highly competitive and dynamic, owing to rapidly advancing technologies. We face potential competition from many different sources, including major pharmaceutical, specialty pharmaceutical and biotechnology companies, academic institutions, government agencies and public and private research institutions. Any product candidates that we successfully develop and commercialize will compete with existing treatments and new treatments that may become available in the future. In addition, during development, our product candidates may compete against other experimental treatments, whether cell therapy or other modalities, for patients with certain histologies or patients with tumors expressing certain antigen targets of interest.

We are aware of a number of companies using *ex vivo* cell therapy approaches to treat solid tumors. Some of these companies may have substantially greater financial and other resources than we have, such as larger research and development staff and well-established marketing and sales forces, or may operate in jurisdictions where lower standards of evidence are required to bring products to market. There are a number of companies developing CAR T cells, TCR T cells or TIL-based immune-oncology therapies for the treatment of solid tumors including Achilles Therapeutics plc, Adaptimmune Therapeutics Plc., Bristol Myers Squibb Co., Gilead Sciences Inc., Instil Bio Inc., Intima Bioscience Inc., Iovance Biotherapeutics Inc., the Janssen Pharmaceutical Companies of Johnson & Johnson, Nanjing Legend Biotech, Nurix Therapeutics Inc., Oncternal Therapeutics Inc., Precigen Inc. and TILT Biotherapeutics Ltd. Among companies developing cell therapies for solid tumors, we believe we are substantially differentiated by our technology platforms, knowledge, experience, scientific personnel and robust intellectual property portfolio. We believe the key competitive factors affecting the success of any of our product candidates will include efficacy, safety, accessibility, price and cost of manufacturing.

Collaboration, License and Success Payment Agreements

Fred Hutch License Agreement and Success Payment Agreement

In December 2018, we entered into a license agreement with Fred Hutchinson Cancer Research Center (Fred Hutch) that grants us an exclusive, worldwide, sublicensable license under certain patent rights, and a non-exclusive, worldwide, sublicensable license under certain technology, to research, develop, manufacture, improve and commercialize products and processes covered by such patent rights or incorporating such technology for all fields of use utilizing CARs and/or TCRs. This agreement was amended in June 2019, September 2019, January 2020, and August 2020. We paid Fred Hutch an upfront payment of $150,000. In connection with the license agreement, we entered into a letter agreement with Fred Hutch pursuant to which we issued to Fred Hutch 1,075,000 shares of our common stock.

We also entered into a letter agreement with Fred Hutch in December 2018 under which we agreed to make success payments to Fred Hutch, payable in cash or publicly traded equity at our discretion. These success payments are based on increases in the per share fair market value of our Series A convertible preferred stock or any security into which such stock has been converted or for which it has been exchanged during the success payment period, which is a period of time that begins on the date of our letter agreement with Fred Hutch and ends on the earlier of: (a) the ninth anniversary of that date and (b) the earlier of (i) the date on which we sell, lease, transfer or exclusively license all or substantially all of our assets to another company and (ii) the date on which we merge or consolidate with or into another entity (other than a merger in which our pre-merger stockholders own a majority of the shares of the surviving entity). Upon the closing of our initial public offering, all shares of Series A convertible preferred stock then outstanding converted into an equivalent number of shares of our common stock. Success payments will be owed (if applicable) after measurement of the value of our common stock in connection with the following valuation dates during the success payment period: (1) the date of the first anniversary of our initial public offering; (2) the second anniversary of such date; (3) each two year anniversary thereafter (i.e., the four year anniversary, six year anniversary, etc. of such date); (4) the date on which we sell, lease, transfer or exclusively license all or substantially all of our assets to another company; (5) the date on which we merge or consolidate with or into another entity (other than a merger in which our pre-merger stockholders own a majority of the shares of the surviving entity); and (6) the last day of the nine year period. Any success payment will generally be made within 45 days after the applicable valuation date, except that in the case of a merger or sale of all of our company's assets, the success payment will be made on the earlier of the 90th day following the transaction or the first date that transaction proceeds are paid to any of our stockholders. In the case of (1), (2) and (3), the value of our common stock will be determined by the average trading price of a share of our common stock over the consecutive 90-day period preceding the

date the success payment is made; the value will otherwise be determined either, in the case of a merger or stock sale, by the consideration paid in the transaction for each share of our stock or the stock of the acquiring entity (or their parent or affiliate). The amount of a success payment is determined based on whether the value of our common stock meets or exceeds certain specified threshold values ascending from $18.29 per share to $91.44 per share, in each case subject to adjustment for any stock dividend, stock split, combination of shares or other similar events. Each threshold is associated with a success payment, ascending from $10.0 million at $18.29 per share to $200.0 million at $91.44 per share, payable if such threshold is reached. Any previous success payments made to Fred Hutch are credited against the success payment owed as of any valuation date, so that Fred Hutch does not receive multiple success payments in connection with the same threshold. The success payments paid to Fred Hutch will not exceed, in aggregate, $200.0 million, which would be owed only when the value of the common stock reaches $91.44 per share.

Stanford License Agreement and Success Payment Agreement

In January 2019, we entered into a license agreement with The Board of Trustees of the Leland Stanford Junior University (Stanford) that grants us an exclusive, worldwide, sublicensable license under certain patent rights, and a non-exclusive, worldwide, sublicensable license under certain other patent rights and technology, to make, have made, use, offer to sell, sell, import or otherwise offer to dispose of products and processes covered by such patent rights or incorporating such technology for all fields of use utilizing CARs and/or TCRs. The patents and patent applications covered by this agreement are directed to compositions and methods of treating related to preventing, reversing, inhibiting, reducing or modulating T cell exhaustion and compositions and methods related to engineered cell surface receptors including CARs. We also have the right to add certain Stanford patent applications covering certain inventions that are improvements to the existing patents and patent applications, as well as a right of first negotiation for other patent applications covering inventions made in the principal investigator's lab that relate to and are necessary or useful for utilizing CARs and/or TCRs.

We are obligated to use commercially reasonable efforts to develop, manufacture and sell licensed products and to develop markets for licensed products.

We paid Stanford an upfront payment of $400,000. We are required to pay Stanford an annual maintenance fee in the mid tens of thousands on the second anniversary of entering into this agreement, and each anniversary thereafter until the date of the first commercial sale of a licensed product. We are obligated to pay Stanford up to a maximum of $3.7 million per target upon achievement of certain specified clinical and regulatory milestones. We are also obligated to pay Stanford $2.5 million collectively for all licensed products upon our achievement of a certain commercial milestone. In addition, the license agreement provides that we are required to pay Stanford low single-digit tiered royalties based on annual net sales of the licensed products by us and by our sublicensees. If we seek to challenge the validity of any of the licensed patents, during the pendency of such action our royalty rate will increase, and if the outcome of such challenge finds that patent is both valid and infringed our royalty rate will increase further. We are also required to pay Stanford (a) royalties in the mid-teens percentage of the payments that we receive from sublicensees of the rights solely licensed to us by Stanford, or (b) if sublicensed with other intellectual property, on a tiered basis in the low six figures up to $300,000.

The license agreement will expire, on a licensed product-by-licensed product and country-by-country basis, on the expiration of the last to expire valid claim of the licensed patents rights covering such licensed product in such country. We may terminate the agreement at will in its entirety or with respect to any licensed patent. Stanford has the right to terminate the agreement in the event of our uncured breach.

In connection with the license agreement, we entered into a letter agreement in January 2019 with Stanford pursuant to which we issued to Stanford 910,000 shares of our common stock.

We also entered into a letter agreement with Stanford in October 2020, under which we agreed to make success payments to Stanford, payable in cash or publicly traded equity at our discretion. These success payments are based on increases in the per share fair market value of our Series A convertible preferred stock or any security into which such stock has been converted or for which it has been exchanged during the success payment period, which is a period of time that begins on the date of our letter agreement with Stanford and ends on the earlier of: (a) the ninth anniversary of that date and (b) the earlier of (i) the date on which we sell, lease, transfer or exclusively license all or substantially all of our assets to another company and (ii) the date on which we merge or consolidate with or into another entity (other than a merger in which our pre-merger stockholders own a majority of the shares of the surviving entity). Upon the closing of our initial public offering, all shares of Series A convertible preferred stock then outstanding converted into an equivalent number of shares of our common stock. Success payments will be owed (if applicable) after measurement of the value of our common stock in connection with the following valuation dates during the success payment period: (1) the date of the

first anniversary of our initial public offering; (2) the second anniversary of such date; (3) each two year anniversary thereafter (i.e., the four year anniversary, six year anniversary, etc. of such date); (4) the date on which we sell, lease, transfer or exclusively license all or substantially all of our assets to another company; (5) the date on which we merge or consolidate with or into another entity (other than a merger in which our pre-merger stockholders own a majority of the shares of the surviving entity); and (6) the last day of the nine year period. Any success payment will generally be made within 45 days after the applicable valuation date, except that in the case of a merger or sale of all of our company's assets, the success payment will be made on the earlier of the 90th day following the transaction or the first date that transaction proceeds are paid to any of our stockholders. In the case of (1), (2) and (3), the value of our common stock will be determined by the average trading price of a share of our common stock over the consecutive 90-day period preceding the date the success payment is made; the value will otherwise be determined either, in the case of a merger or stock sale, by the consideration paid in the transaction for each share of our stock or the stock of the acquiring entity (or their parent or affiliate). The amount of a success payment is determined based on whether the value of our common stock meets or exceeds certain specified threshold values ascending from $18.29 per share to $91.44 per share, in each case subject to adjustment for any stock dividend, stock split, combination of shares or other similar events. Each threshold is associated with a success payment, ascending from $10.0 million at $18.29 per share to $200.0 million at $91.44 per share, payable if such threshold is reached. Any previous success payments made to Stanford are credited against the success payment owed as of any valuation date, so that Stanford does not receive multiple success payments in connection with the same threshold. The success payments paid to Stanford will not exceed, in aggregate, $200.0 million, which would be owed only when the value of the common stock reaches $91.44 per share.

GSK Collaboration and License Agreement

In May 2019, we entered into a collaboration and license agreement with GSK that became effective on July 7, 2019 and was amended in June 2020 and December 2021. Under the GSK Agreement, we agreed to work collaboratively with GSK to research and develop certain T cell therapies incorporating our technology platforms or other cell therapy innovations as applied to CARs or TCRs under distinct collaboration programs. The GSK Agreement could include T cell therapies for up to a total of nine CAR or TCR targets, and GSK may select these CAR or TCR targets for collaboration during a specified period, subject to certain restrictions.

Under the GSK Agreement, we granted GSK an option, for each Lyell cell therapy innovation that was the subject of a collaboration program under the GSK Agreement, to obtain an exclusive, worldwide license to develop and commercialize that Lyell cell therapy innovations as part of a TCR or CAR cell therapy for the specific target, for human diagnostic and therapeutic uses, except that we retain rights for the China territory for T cell therapies directed to targets that were within GSK's pipeline and met certain criteria prior to inclusion in the GSK Agreement. We also retain rights to the Lyell cell therapy innovations for other products and targets.

For potential T cell therapies that are the subject of collaboration programs under the GSK Agreement, we are responsible for certain research and development activities, at our cost, up to GSK's option point. The GSK option point is prior to IND filing for therapies to targets that were within GSK's pipeline and met certain criteria prior to inclusion in the GSK Agreement and, for other targets, the GSK option point is after results of a specific clinical trial. At the GSK option point, together with GSK we must engage in an option process for a specified period of time, at the end of which GSK may exercise its option. Generally, each party is responsible for its own cost and expense to conduct each collaboration program. Upon any such option exercise, GSK will be responsible for further development, at GSK's cost.

In April 2021, GSK exercised its option to the NY-ESO-1 TCR with Gen-R program. As a result of such option exercise, we will transition to GSK responsibility for future research and development of this program at its cost and expense.

For a specified time period, we are prohibited from working with third parties to develop or commercialize CAR or TCR T cell therapies, except (a) in China for non-GSK programs, (b) with entities such as research institutions, contractors and clinical sites that are not granted commercial rights, (c) for companies with supporting tools and (d) in programs for which the therapy targets one of the targets excluded from the GSK Agreement. Currently five targets are excluded, and we may exclude three additional targets during a specified period. In addition, there is a target-based exclusivity for so long as GSK is paying royalties on a product to that target.

We received an upfront payment of $45.0 million from GSK under the GSK Agreement. In addition to the upfront payment, we are eligible to receive up to two one-time payments, totaling up to approximately $200.0 million in aggregate for technology validation of Lyell's cell therapy innovations. For each cell therapy target for which there has been a joint collaboration program, Lyell also could receive up to approximately $400.0 million in aggregate in development and sales

milestones if the target is already within GSK's pipeline and meets certain criteria, up to approximately $900.0 million in aggregate in development and sales milestones for all other targets and tiered royalties on a per-product basis ranging from low to high single digits for targets that are already within GSK's pipeline and meet certain criteria, or from high single digits to low teens for all other targets. Milestones are paid once per target, even if there is more than one Lyell innovation applied to a T cell therapy directed to that target.

The GSK Agreement will expire on a product-by-product and country-by-country basis upon the latest of (a) the expiration of the last valid claim of the last to expire licensed patent covering such product in such country, (b) the expiration of all regulatory exclusivity for such product in such country or (c) a specified period after the first commercial sale of such product in such country. GSK may terminate the GSK Agreement in its entirety or on a collaboration program-by-collaboration program basis for convenience or in its entirety upon a change of control of Lyell by a GSK competitor. Each party may terminate the GSK Agreement in its entirety or with respect to a collaboration program in the event of an uncured material breach by the other party or in its entirety for the other party's insolvency. We may terminate the GSK Agreement in the event of a patent challenge by GSK or specified third parties.

In December 2021, we entered into a Second Amendment to Collaboration and License Agreement (Collaboration Amendment) with GSK. The Collaboration Amendment amends the terms of the GSK Agreement. Pursuant to the Collaboration Amendment, among other things, we will manufacture the NY-ESO-1 + Epi-R TCR cell therapy product candidate for an initial planned Phase 1 clinical trial (Epi-R Trial) at our manufacturing facility in Bothell, Washington. GSK will conduct the Epi-R Trial under its First Time in Humans Master Protocol for NY-ESO-1 (FTIH Protocol) pursuant to a clinical plan agreed to by us and GSK. We are responsible for submitting the IND for this product candidate with the FDA, and GSK is responsible for filing its updated FTIH Protocol and for regulatory interactions with FDA related to that protocol. Each party bears its own costs associated with its responsibilities under the GSK Agreement. The Collaboration Amendment further specifies that we are eligible (i) to receive milestone payments for any use of an Anti-Exhaustion Component in connection with a collaboration target, whether or not there was a specific research program and (ii) for one set of milestone and royalty payments with respect to a collaboration target, even if the approved product uses more than one Anti-Exhaustion Component. The Collaboration Amendment also modifies the scope of license grants in the GSK Agreement to conform to the modified responsibilities under the Collaboration Amendment and specifies that Lyell owns improvements to the Epi-R and Gen-R technologies.

National Cancer Institute (NCI) License Agreement

In December 2020, we entered into a license agreement with NCI that grants us a worldwide license to certain patent rights, and intellectual property rights related to certain know-how, to develop, make and commercialize licensed products and practice licensed processes for the treatment of human cancers, which license is (A) exclusive with respect to certain licensed patents for use in the field of (1) companion diagnostics for our T cell therapy products, (2) adoptive T cell therapy products generated from autologously derived, induced pluripotent stem cells or (3) adoptive T cell therapy products isolated from autologously-derived and allogeneic-derived peripheral blood; (B) non-exclusive with respect to all licensed patents for use in the field of (4) autologous and allogeneic, adoptive T cell therapy products; and (C) non-exclusive with respect to the licensed know-how for use in the fields of (1) through (4). The licensed patents and licensed know-how covered are directed, in part, to thymic emigrant cells, hematopoietic progenitor cells, thymic organoid from human pluripotent stem cells, T cells, T memory stem cells and their use for the treatment of cancer in humans. We may grant sublicenses under our license with NCI's written approval and, if the rights we are sublicensing are non-exclusive, they must be sublicensed in combination with certain other intellectual property. On or before the seventh anniversary of the agreement, it is the intention of NCI and us to enter into an amendment to the agreement, which amendment is intended to narrow our exclusive license for certain licensed patents to a defined list of cancer indications that meet certain criteria. Such amendment would also extend the term of our exclusive license to such licensed patents so that it would continue beyond such seventh anniversary until the expiration of the last to expire of such licensed patents.

We are obligated to use commercially reasonable efforts to develop, manufacture and sell licensed products and to adhere to an agreed-upon clinical development plan and performance milestones.

We paid NCI an upfront payment of $100,000. We have paid a prorated annual maintenance payment to NCI in the mid four figures and we also agreed to pay NCI future annual maintenance payments in the high five figures, which payments may be credited against earned royalties. We may be obligated to pay NCI up to a maximum of $3.1 million upon achievement of certain specified clinical and regulatory milestones. We may also be obligated to pay NCI a maximum of $12.0 million collectively for all licensed products upon our achievement of certain commercial milestones. In addition, the license agreement provides that we are required to pay NCI low single-digit royalties on annual net sales of the licensed products.

The license agreement will expire on the expiration of the last to expire valid claim of the licensed patents. We may terminate the agreement at will, in its entirety, or on a patent-by-patent and country-by-country basis. NCI has the right to terminate the agreement in the event of our uncured breach or to terminate or modify the agreement, at NCI's option, for our failure to meet certain diligence obligations, in the event of certain false statements or omissions by us, for our violation of certain laws, for our material breach of a covenant in this agreement, if we fail to maintain reasonable availability of licensed products or licensed processes, if we cannot meet certain health and safety needs or if we cannot reasonably justify a failure to comply with certain production requirements.

Intellectual Property

We strive to protect and enhance the proprietary technology, inventions and improvements that are commercially important to our business, including seeking, maintaining and defending patent rights, whether developed internally or licensed from our collaborators or other third parties. Our policy is to seek to protect our proprietary position by, among other methods, filing patent applications in the United States and in jurisdictions outside of the United States related to our proprietary technology, inventions, improvements and product candidates that are important to the development and implementation of our business. We also rely on trade secrets and know-how relating to our proprietary technology and product candidates, continuing innovation and in-licensing opportunities to develop, strengthen and maintain our proprietary position in the field of cell and gene therapy. We additionally plan to rely on data exclusivity, market exclusivity and patent term extensions when available, and if appropriate, may seek and rely on regulatory protection afforded through orphan drug designations. Our commercial success may depend in part on our ability to obtain and maintain patent and other proprietary protection for our technology, inventions and improvements; to preserve the confidentiality of our trade secrets; to maintain our licenses to use intellectual property owned by third parties; to defend and enforce our proprietary rights, including our patents; and to operate without infringing on the valid and enforceable patents and other proprietary rights of third parties.

We have in-licensed and procured, and filed for numerous patent applications, which include claims directed to compositions, methods of use, processes, dosing and formulations, and possess substantial know-how and trade secrets relating to the development and commercialization of our cell engineering technology platforms and related product candidates, including related manufacturing processes and protocols. Our intellectual property strategy is designed to provide multi-layered protection covering our core technologies, such as Epi-R, Gen-R and cell rejuvenation, as well as various aspects of our product candidates. For all patent applications, we determine claiming strategy on a case-by-case basis. We may file patent applications containing claims for protection of all useful applications of our proprietary technology platforms and any products, as well as new applications and/or uses we discover for existing technology platforms and products. We continuously reassess the number and type of patent applications, as well as the pending and issued patent claims, to ensure that maximum coverage and value are obtained for our processes and compositions. Further, claims may be modified during patent prosecution to meet our intellectual property and business needs. Notwithstanding these efforts, we cannot be sure that any patents will be granted with respect to any patent application we have licensed or filed or may license or file in the future, and we cannot be sure that any patents we have licensed or patents that may be licensed or granted to us in the future will not be challenged, invalidated or circumvented or that such patents will be commercially useful in protecting our technologies.

As of March 1, 2022, our in-licensed and owned patent portfolio consists of over 30 issued patents and 135 pending patent applications that we have licensed and over 40 pending patent applications that we own. Our portfolio covers various aspects of our core technologies including Epi-R, Gen-R and cell rejuvenation as well as our product candidates. The patents and patent applications in our portfolio are held primarily in the United States, Europe, Canada, Japan and Australia. For information related to our in-licensed intellectual property, see the subsection titled under "—Collaboration, License and Success Payment Agreements."

Individual patents extend for varying periods of time, depending upon the date of filing of the patent application, the date of patent issuance and the legal term of patents in the countries in which they are obtained. Generally, patents issued for applications filed in the United States are effective for 20 years from the earliest nonprovisional filing date. In the United States, a patent's term may be lengthened by patent term adjustment (PTA), which compensates a patentee for administrative delays by the USPTO in examining and granting a patent, or may be shortened if a patent is terminally disclaimed over an earlier filed patent . In addition, in certain instances, the patent term of a U.S. patent that covers an FDA-approved drug may also be eligible for extension to recapture a portion of the term effectively lost as a result of clinical trials and the FDA regulatory review period, such extension is referred to as patent term extension (PTE). The restoration period cannot be longer than five years and the total patent term, including the restoration period, must not exceed 14 years following FDA approval. Similar provisions are available in Europe and certain other foreign jurisdictions to extend the term of a patent that covers an approved drug. However there is no guarantee that the applicable authorities,

including the FDA in the United States, will agree with our assessment of whether such extensions should be granted, and if granted, the length of such extensions. The duration of patents outside of the United States varies in accordance with provisions of applicable local law, but typically is also 20 years from the earliest nonprovisional filing date. The actual protection afforded by a patent varies on a product-by-product basis, from country-to-country, and depends upon many factors, including the type of patent, the scope of its coverage, the availability of regulatory-related extensions, the availability of legal remedies in a particular country and the validity and enforceability of the patent.

As of March 1, 2022, our registered trademark portfolio currently contains approximately 135 registered trademarks and pending trademark applications, consisting of approximately 10 pending trademark applications in the United States, approximately 105 foreign pending trademark applications in Argentina, Australia, Brazil, Canada, China, Colombia, Costa Rica, European Union, Hong Kong, India, Israel, Japan, Mexico, New Zealand, Oman, South Korea, Russia, Singapore, South Africa, Switzerland, UAE and Venezuela; and approximately 20 trademark registrations in the following countries through national filings: Australia, Brazil, China, European Union, Hong Kong, India, Israel, Japan, Mexico, New Zealand, Republic of Korea, Switzerland and the United Kingdom.

We may also rely, in some circumstances, on trade secrets to protect our technology. However, trade secrets are difficult to protect. We seek to protect our technology and product candidates, in part, by entering into confidentiality agreements with those who have access to our confidential information, including our employees, contractors, consultants, collaborators and advisors. We also seek to preserve the integrity and confidentiality of our proprietary technology and processes by maintaining physical security of our premises and physical and electronic security of our information technology systems. Although we have confidence in these individuals, organizations and systems, agreements or security measures may be breached and we may not have adequate remedies for any breach. In addition, our trade secrets may otherwise become known or may be independently discovered by competitors. To the extent that our employees, contractors, consultants, collaborators and advisors use intellectual property owned by others in their work for us, disputes may arise as to the rights in related or resulting know-how and inventions. For this and more comprehensive risks related to our proprietary technology, inventions, improvements and product candidates, see the subsection titled “Risk Factors —Risks Relating to Our Intellectual Property.”

Sales and Marketing

Given our stage of development, we have not yet established a commercial organization or distribution capabilities. We intend to either build a commercial infrastructure to support sales of any approved products or outsource this function to third parties. We intend to continue evaluating opportunities to work with partners that enhance our capabilities with respect to the development and commercialization of LYL797 or LYL845. In addition, we intend to commercialize our product candidates, if approved, in key markets either alone or with partners to maximize the worldwide commercial potential of our programs.

Government Regulation

The FDA and other regulatory authorities at federal, state and local levels, as well as in foreign countries, extensively regulate, among other things, the research, development, testing, manufacture, quality control, import, export, safety, effectiveness, labeling, packaging, storage, distribution, record keeping, approval, advertising, promotion, marketing, post-approval monitoring and post-approval reporting of biologics such as those we are developing. We, along with third-party contractors, will be required to navigate the various preclinical, clinical and commercial approval requirements of the governing regulatory agencies of the countries in which we wish to conduct trials or seek approval or licensure of our product candidates. The process of obtaining regulatory approvals and the subsequent compliance with applicable federal, state, local and foreign statutes and regulations require the expenditure of substantial time and financial resources.

U.S. Biologics Regulation

In the United States, biological products are subject to regulation under the Federal Food, Drug, and Cosmetic Act, the Public Health Service Act and other federal, state, local and foreign statutes and regulations. The process required by the FDA before biologics may be marketed in the United States generally involves the following:

- completion of preclinical laboratory tests and animal studies performed in accordance with the FDA’s Good Laboratory Practice requirements (GLP);
- submission to the FDA of an IND, which must become effective before clinical trials may begin;

- approval by an Institutional Review Board (IRB) or ethics committee at each clinical site before the trial is commenced;
- performance of adequate and well-controlled human clinical trials according to the FDA's regulations commonly referred to as GCP, regulations and any additional requirements for the protection of human research subjects and their health information to establish the safety, purity and potency of the proposed biologic product candidate for its intended purpose;
- preparation of and submission to the FDA of a Biologics License Application (BLA), after completion of all pivotal clinical trials;
- satisfactory completion of an FDA Advisory Committee review, if applicable;
- a determination by the FDA within 60 days of its receipt of a BLA to file the application for review;
- satisfactory completion of an FDA pre-approval inspection of the manufacturing facility or facilities at which the proposed product is produced to assess compliance with cGMP and to assure that the facilities, methods and controls are adequate to preserve the biological product's continued safety, purity and potency and, if applicable, to assess compliance with the FDA's cGTPs requirements for the use of human cellular and tissue products, and of selected clinical investigation sites to assess compliance with GCPs;
- potential FDA audit of the nonclinical and clinical trial sites that generated the data in support of the BLA; and
- FDA review and approval of the BLA to permit commercial marketing of the product for particular indications for use in the United States.

Before testing any biological product candidate in humans, the product candidate enters the preclinical testing stage. Preclinical tests, also referred to as nonclinical studies, include laboratory evaluations of product chemistry, toxicity and formulation, as well as animal studies to assess the potential safety and activity of the product candidate. The conduct of the preclinical tests must comply with federal regulations and requirements including GLPs.

Prior to beginning the first clinical trial with a product candidate in the United States, we must submit an IND to the FDA. An IND is a request for authorization from the FDA to administer an investigational new drug to humans. The central focus of an IND submission is on the general investigational plan and the protocol(s) for clinical trials. The IND also includes results of animal and *in vitro* studies assessing the toxicology, pharmacokinetics, pharmacology and pharmacodynamic characteristics of the product; chemistry, manufacturing and controls information; and any available human data or literature to support the use of the investigational product. An IND must become effective before human clinical trials may begin. The IND automatically becomes effective 30 days after receipt by the FDA, unless the FDA, within the 30-day time period, raises safety concerns or questions about the proposed clinical trial. In such a case, the IND may be placed on clinical hold and the IND sponsor and the FDA must resolve any outstanding concerns or questions before the clinical trial can begin. Submission of an IND therefore may or may not result in FDA authorization to begin a clinical trial.

In addition to the submission of an IND to the FDA before initiation of a clinical trial in the United States, certain human clinical trials involving recombinant or synthetic nucleic acid molecules are subject to oversight of IBCs as set forth in the NIH Guidelines for Research Involving Recombinant DNA Molecules (the NIH Guidelines). Specifically, under the NIH Guidelines, supervision of human gene transfer trials includes evaluation and assessment by an Institutional Biosafety Committee (IBC), a local institutional committee that reviews and oversees research utilizing recombinant or synthetic nucleic acid molecules at that institution. The IBC assesses the safety of the research and identifies any potential risk to public health or the environment, and such review may result in some delay before initiation of a clinical trial. While the NIH Guidelines are not mandatory unless the research in question is being conducted at or sponsored by institutions receiving NIH funding of recombinant or synthetic nucleic acid molecule research, many companies and other institutions not otherwise subject to the NIH Guidelines voluntarily follow them.

Clinical trials involve the administration of the investigational product to human subjects under the supervision of qualified investigators in accordance with GCPs, which include the requirement that all research subjects provide their informed consent for their participation in any clinical trial. Clinical trials are conducted under protocols detailing, among other things, the objectives of the study, the parameters to be used in monitoring safety and the effectiveness criteria to be evaluated. A separate submission to the existing IND must be made for each successive clinical trial conducted during product development and for any subsequent protocol amendments. Furthermore, an independent IRB for each site proposing to conduct the clinical trial must review and approve the plan for any clinical trial and its informed consent form before the clinical trial begins at that site, and must monitor the study until completed. Regulatory authorities, the IRB or the sponsor may suspend a clinical trial at any time on various grounds, including a finding that the subjects are being exposed to an unacceptable health risk or that the trial is unlikely to meet its stated objectives. Some studies also include

oversight by an independent group of qualified experts organized by the clinical trial sponsor, known as a data safety monitoring board, which provides authorization for whether or not a study may move forward at designated check points based on access to certain data from the study and may halt the clinical trial if it determines that there is an unacceptable safety risk for subjects or other grounds, such as no demonstration of efficacy. There are also requirements governing the reporting of ongoing clinical trials and clinical trial results to public registries.

For purposes of BLA approval, human clinical trials are typically conducted in three sequential phases that may overlap or be combined:

- Phase 1—The investigational product is initially introduced into healthy human subjects or patients with the target disease or condition. These trials are designed to test the safety, dosage tolerance, absorption, metabolism and excretion of the investigational product in humans, the side effects associated with increasing doses, and, if possible, to gain early evidence on effectiveness.
- Phase 2—The investigational product is administered to a limited patient population with a specified disease or condition to evaluate the preliminary efficacy, optimal dosages and dosing schedule and to identify possible adverse side effects and safety risks. Multiple Phase 2 clinical trials may be conducted to obtain information prior to beginning larger and more expensive Phase 3 clinical trials.
- Phase 3—The investigational product is administered to an expanded patient population to further evaluate dosage, to provide statistically significant evidence of clinical efficacy and to further test for safety, generally at multiple geographically dispersed clinical trial sites. These clinical trials are intended to establish the overall risk/benefit ratio of the investigational product and to provide an adequate basis for product approval.

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

Concurrent with clinical trials, companies may complete additional animal studies and develop additional information about the biological characteristics of the product candidate, and must finalize a process for manufacturing the product in commercial quantities in accordance with cGMP requirements. The manufacturing process must be capable of consistently producing quality batches of the product candidate and, among other things, must develop methods for testing the identity, strength, quality and purity of the final product. Additionally, appropriate packaging must be selected and tested, and stability studies must be conducted to demonstrate that the product candidate does not undergo unacceptable deterioration over its shelf life.

BLA Submission and Review by the FDA

Assuming successful completion of all required testing in accordance with all applicable regulatory requirements, the results of product development, nonclinical studies and clinical trials are submitted to the FDA as part of a BLA requesting approval to market the product for one or more indications. The BLA must include all relevant data available from preclinical and clinical trials, including negative or ambiguous results as well as positive findings, together with detailed information relating to the product's chemistry, manufacturing, controls and proposed labeling, among other things. Data can come from company-sponsored clinical trials intended to test the safety and effectiveness of a use of the product, or from a number of alternative sources, including trials initiated by independent investigators. The submission of a BLA requires payment of a substantial application user fee to the FDA, unless a waiver or exemption applies.

Within 60 days following submission of the application, the FDA reviews a BLA submitted to determine if it is substantially complete before the FDA accepts it for filing. The FDA may refuse to file any BLA that it deems incomplete or not properly reviewable at the time of submission and may request additional information. In this event, the BLA must be resubmitted with the additional information. Once a BLA has been accepted for filing, the FDA's goal is to review standard applications within 10 months after the filing date, or, if the application qualifies for priority review, six months after the FDA accepts the application for filing. In both standard and priority reviews, the review process may also be extended by FDA requests for additional information or clarification. The FDA reviews a BLA to determine, among other things, whether a product is safe, pure and potent and the facility in which it is manufactured, processed, packed or held meets standards designed to assure the product's continued safety, purity and potency. The FDA may also convene an advisory committee to provide clinical insight on application review questions. The FDA is not bound by the recommendations of an advisory committee, but it considers such recommendations carefully when making decisions.

Before approving a BLA, the FDA will typically inspect the facility or facilities where the product is manufactured. The FDA will not approve an application unless it determines that the manufacturing processes and facilities are in compliance with cGMP and adequate to assure consistent production of the product within required specifications. For a product candidate that is also a human cellular or tissue product, the FDA also will not approve the application if the

manufacturer is not in compliance with cGTPs. These are FDA regulations that govern the methods used in, and the facilities and controls used for, the manufacture of human cells, tissues and cellular and tissue-based products, or HCT/Ps, which are human cells or tissue intended for implantation, transplant, infusion or transfer into a human recipient. The primary intent of the GTP requirements is to ensure that cell and tissue based products are manufactured in a manner designed to prevent the introduction, transmission and spread of communicable disease. FDA regulations also require tissue establishments to register and list their HCT/Ps with the FDA and, when applicable, to evaluate donors through screening and testing. Additionally, before approving a BLA, the FDA will typically inspect one or more clinical sites to assure compliance with GCP. If the FDA determines that the application, manufacturing process or manufacturing facilities are not acceptable, it will outline the deficiencies in the submission and often will request additional testing or information. Notwithstanding the submission of any requested additional information, the FDA ultimately may decide that the application does not satisfy the regulatory criteria for approval.

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

If regulatory approval of a product is granted, such approval will be granted for particular indications and may entail limitations on the indicated uses for which such product may be marketed. For example, the FDA may approve the BLA with a REMS, to ensure the benefits of the product outweigh its risks, or otherwise limit the scope of any approval. A REMS is a safety strategy implemented to manage a known or potential serious risk associated with a product and to enable patients to have continued access to such medicines by managing their safe use, and could include medication guides, physician communication plans or elements to assure safe use, such as restricted distribution methods, patient registries and other risk minimization tools. The FDA also may condition approval on, among other things, changes to proposed labeling or the development of adequate controls and specifications. Once approved, the FDA may withdraw the product approval if compliance with pre- and post-marketing requirements is not maintained or if problems occur after the product reaches the marketplace. The FDA may require one or more Phase 4 post-marketing trials and surveillance to further assess and monitor the product's safety and effectiveness after commercialization, and may limit further marketing of the product based on the results of these post-marketing studies.

Expedited Development and Review Programs

The FDA offers a number of expedited development and review programs for qualifying product candidates. For example, the fast track program is intended to expedite or facilitate the process for reviewing new products that are intended to treat a serious or life-threatening disease or condition and demonstrate the potential to address unmet medical needs for the disease or condition. Specifically, new biological products are eligible for fast track designation if they are intended to treat a serious or life-threatening disease or condition and demonstrate the potential to address unmet medical needs for the disease or condition. Fast track designation applies to the combination of the product and the specific indication for which it is being studied. The sponsor of a new biologic may request that the FDA designate the biologic as a fast track product at any time during the clinical development of the product. The sponsor of a fast track product has opportunities for more frequent interactions with the applicable FDA review team during product development and, once a BLA is submitted, the product candidate may be eligible for priority review. A fast track product may also be eligible for rolling review, where the FDA may consider for review sections of the BLA on a rolling basis before the complete application is submitted, if the sponsor provides a schedule for the submission of the sections of the BLA, the FDA agrees to accept sections of the BLA and determines that the schedule is acceptable, and the sponsor pays any required user fees upon submission of the first section of the BLA.

A product candidate intended to treat a serious or life-threatening disease or condition may also be eligible for breakthrough therapy designation to expedite its development and review. A product candidate can receive breakthrough therapy designation if preliminary clinical evidence indicates that the product candidate, alone or in combination with one or more other drugs or biologics, may demonstrate substantial improvement over existing therapies on one or more clinically significant endpoints, such as substantial treatment effects observed early in clinical development. The designation includes all of the fast track program features, as well as more intensive FDA interaction and guidance beginning as early as Phase 1 and an organizational commitment to expedite the development and review of the product candidate, including involvement of senior managers.

Any marketing application for a drug or biologic submitted to the FDA for approval, including a product candidate with a fast track designation and/or breakthrough therapy designation, may be eligible for other types of FDA programs intended to expedite development and review, such as priority review and accelerated approval. A product candidate is eligible for priority review if it has the potential to provide safe and effective therapy where no satisfactory alternative therapy exists or a significant improvement in the treatment, diagnosis or prevention of a disease compared to marketed products. The FDA will attempt to direct additional resources to the evaluation of an application for a new biological product designated for priority review in an effort to facilitate the review. For original BLAs, priority review designation means the FDA's goal is to take action on the marketing application within six months of the 60-day filing date (as compared to 10 months under standard review).

Additionally, product candidates studied for their safety and effectiveness in treating serious or life-threatening diseases or conditions may receive accelerated approval upon a determination that the product has an effect on a surrogate endpoint that is reasonably likely to predict clinical benefit, or on a clinical endpoint that can be measured earlier than irreversible morbidity or mortality, that is reasonably likely to predict an effect on irreversible morbidity or mortality or other clinical benefit, taking into account the severity, rarity or prevalence of the condition and the availability or lack of alternative treatments. As a condition of accelerated approval, the FDA will generally require the sponsor to perform adequate and well-controlled post-marketing clinical trials to verify and describe the anticipated effect on irreversible morbidity or mortality or other clinical benefit. Products receiving accelerated approval may be subject to expedited withdrawal procedures if the sponsor fails to conduct the required post-marketing studies or if such studies fail to verify the predicted clinical benefit. In addition, the FDA currently requires as a condition for accelerated approval pre-approval of promotional materials, which could adversely impact the timing of the commercial launch of the product.

In 2017, the FDA established a new regenerative medicine advanced therapy (RMAT) designation, which is intended to facilitate an efficient development program for, and expedite review of, any drug or biologic that meets the following criteria: (i) the drug or biologic qualifies as a RMAT, which is defined as a cell therapy, therapeutic tissue engineering product, human cell and tissue product, or any combination product using such therapies or products, with limited exceptions; (ii) the drug or biologic is intended to treat, modify, reverse or cure a serious or life-threatening disease or condition; and (iii) preliminary clinical evidence indicates that the drug or biologic has the potential to address unmet medical needs for such a disease or condition. RMAT designation provides all the benefits of breakthrough therapy designation, including more frequent meetings with the FDA to discuss the development plan for the product candidate and eligibility for rolling review and priority review. Product candidates granted RMAT designation may also be eligible for accelerated approval on the basis of a surrogate or intermediate endpoint reasonably likely to predict long-term clinical benefit, or reliance upon data obtained from a meaningful number of clinical trial sites, including through expansion of trials to additional sites. RMAT-designated products that receive accelerated approval may, as appropriate, fulfill their post-approval requirements through submission of clinical evidence, clinical trials, patient registries or other sources of real-world evidence (such as electronic health records); through the collection of larger confirmatory data sets; or via post-approval monitoring of all patients treated with such therapy prior to approval of such therapy. Fast track designation, breakthrough therapy designation, priority review, accelerated approval and RMAT designation do not change the standards for approval but may expedite the development or approval process. Even if a product candidate qualifies for one or more of these programs, the FDA may later decide that the product no longer meets the conditions for qualification or decide that the time period for FDA review or approval will not be shortened.

Orphan Drug Designation and Exclusivity

Under the Orphan Drug Act, the FDA may grant orphan designation to a drug or biologic intended to treat a rare disease or condition, defined as a disease or condition with a patient population of fewer than 200,000 individuals in the United States, or a patient population greater than 200,000 individuals in the United States and when there is no reasonable expectation that the cost of developing and making available the drug or biologic in the United States will be recovered from sales in the United States for that drug or biologic. Orphan drug designation must be requested before submitting a BLA. After the FDA grants orphan drug designation, the generic identity of the therapeutic agent and its potential orphan use are disclosed publicly by the FDA. Orphan drug designation does not convey any advantage in or shorten the duration of the regulatory review and approval process.

In the United States, orphan drug designation entitles a party to financial incentives such as opportunities for grant funding towards clinical trial costs, tax advantages and user-fee waivers. In addition, if a product that has orphan drug designation subsequently receives the first FDA approval for a particular drug or biologic for the disease for which it has such designation, the product is entitled to orphan product exclusivity, which means that the FDA may not approve any other applications, including a full BLA, to market the same biologic for the same indication for seven years, except in limited circumstances, such as a showing of clinical superiority to the product with orphan drug exclusivity or if the FDA finds that the holder of the orphan drug exclusivity has not shown that it can assure the availability of sufficient quantities

of the orphan drug to meet the needs of patients with the disease or condition for which the drug was designated. Orphan drug exclusivity does not prevent the FDA from approving a different drug or biologic for the same disease or condition, or the same drug or biologic for a different disease or condition. Orphan product exclusivity also could block the approval of one of our products for seven years if a competitor obtains approval of the same biological product as defined by the FDA or if our product candidate is determined to be contained within the competitor's product for the same indication or disease.

A designated orphan drug may not receive orphan drug exclusivity if it is approved for a use that is broader than the indication for which it received orphan designation. In addition, orphan drug exclusive marketing rights in the United States may be lost if the FDA later determines that the request for designation was materially defective or, as noted above, if a second applicant demonstrates that its product is clinically superior to the approved product with orphan exclusivity or the manufacturer of the approved product is unable to assure sufficient quantities of the product to meet the needs of patients with the rare disease or condition.

Post-Approval Requirements

Biologics are subject to pervasive and continuing regulation by the FDA, including, among other things, requirements relating to record-keeping, reporting of adverse experiences, periodic reporting, product sampling and distribution and advertising and promotion of the product. After approval, most changes to the approved product, such as adding new indications or other labeling claims, are subject to prior FDA review and approval. There also are continuing, annual program fees for any marketed products. Biologic manufacturers and other entities involved in the manufacture and distribution of approved biological products are required to register their establishments with the FDA and certain state agencies, and are subject to periodic unannounced inspections by the FDA and certain state agencies for compliance with cGMP requirements and other laws. Accordingly, manufacturers must continue to expend time, money and effort in the area of production and quality control to maintain GMP compliance. Changes to the manufacturing process or facility are strictly regulated, and, depending on the significance of the change, may require prior FDA approval before being implemented. FDA regulations also require investigation and correction of any deviations from cGMP and impose reporting requirements. Accordingly, manufacturers must continue to expend time, money and effort in the area of production and quality control to maintain compliance with cGMP and other aspects of regulatory compliance.

The FDA may withdraw approval if compliance with regulatory requirements and standards is not maintained or if problems occur after the product reaches the market. Later discovery of previously unknown problems with a product, including adverse events of unanticipated severity or frequency, or with 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 restrictions or other restrictions under a REMS program. Other potential consequences include, among other things:

- restrictions on the marketing or manufacturing of the product, complete withdrawal of the product from the market or product recalls;
- fines, warning letters or untitled letters;
- clinical holds on clinical trials;
- refusal of the FDA to approve pending applications or supplements to approved applications, or suspension or revocation of product license approvals;
- product seizure or detention, or refusal to permit the import or export of products;
- consent decrees, corporate integrity agreements, debarment or exclusion from federal healthcare programs;
- mandated modification of promotional materials and labeling and the issuance of corrective information;
- the issuance of safety alerts, Dear Healthcare Provider letters, press releases and other communications containing warnings or other safety information about the product; or
- injunctions or the imposition of civil or criminal penalties.

The FDA closely regulates the marketing, labeling, advertising and promotion of biologics. A company can make only those claims relating to safety and efficacy, purity and potency that are approved by the FDA and in accordance with the provisions of the approved label. The FDA and other agencies actively enforce the laws and regulations prohibiting the promotion of off-label uses. Failure to comply with these requirements can result in, among other things, adverse publicity, warning letters, corrective advertising and potential civil and criminal penalties. FDA sanctions could include refusal to approve pending applications, withdrawal of an approval, clinical hold, warning or untitled letters, product recalls, product

seizures, total or partial suspension of production or distribution, injunctions, fines, refusals of government contracts, mandated corrective advertising or communications with doctors, debarment, restitution, disgorgement of profits or civil or criminal penalties. Physicians may prescribe legally available products for uses that are not described in the product's labeling and that differ from those tested and approved by the FDA. Such off-label uses are common across medical specialties. Physicians may believe, in their independent medical judgment, that such off-label uses are the best treatment for many patients in varied circumstances. The FDA does not regulate the behavior of physicians in their choice of treatments. The FDA does, however, restrict manufacturer's communications on the subject of off-label use of their products.

Biosimilars and Reference Product Exclusivity

The Patient Protection and Affordable Care Act of 2010, as amended by the Health Care and Education Reconciliation Act of 2010 (collectively, the ACA), includes a subtitle called the Biologics Price Competition and Innovation Act (BPCIA), which created an abbreviated approval pathway for biological products that are biosimilar to or interchangeable with an FDA-licensed reference biological product. The FDA has issued several guidance documents outlining an approach to review and approval of biosimilars.

Biosimilarity, which requires that there be no clinically meaningful differences between the biological product and the reference product in terms of safety, purity and potency, can be shown through analytical studies, animal studies and a clinical trial or trials. Interchangeability requires that a product is biosimilar to the reference product and the product must demonstrate that it can be expected to produce the same clinical results as the reference product in any given patient and, for products that are administered multiple times to an individual, the biologic and the reference biologic may be alternated or switched after one has been previously administered without increasing safety risks or risks of diminished efficacy relative to exclusive use of the reference biologic. However, complexities associated with the larger, and often more complex, structures of biological products, as well as the processes by which such products are manufactured, pose significant hurdles to implementation of the abbreviated approval pathway that are still being worked out by the FDA.

Under the BPCIA, an application for a biosimilar product may not be submitted to the FDA until four years following the date that the reference product was first licensed by the FDA. In addition, the approval of a biosimilar product may not be made effective by the FDA until 12 years from the date on which the reference product was first licensed. During this 12-year period of exclusivity, another company may still market a competing version of the reference product if the FDA approves a full BLA for the competing product containing that applicant's own preclinical data and data from adequate and well-controlled clinical trials to demonstrate the safety, purity and potency of its product. The BPCIA also created certain exclusivity periods for biosimilars approved as interchangeable products. At this juncture, it is unclear whether products deemed "interchangeable" by the FDA will, in fact, be readily substituted by pharmacies, which are governed by state pharmacy law.

A biological product can also obtain pediatric market exclusivity in the United States. Pediatric exclusivity, if granted, adds six months to existing exclusivity periods and patent terms. This six-month exclusivity, which runs from the end of other exclusivity protection or patent term, may be granted based on the voluntary completion of a pediatric study in accordance with an FDA-issued "Written Request" for such a study. The BPCIA is complex and continues to be interpreted and implemented by the FDA. In addition, government proposals have sought to reduce the 12-year reference product exclusivity period. Other aspects of the BPCIA, some of which may impact the BPCIA exclusivity provisions, have also been the subject of recent litigation. As a result, the ultimate impact, implementation and impact of the BPCIA is subject to significant uncertainty.

Government Regulation Outside of the United States

In addition to regulations in the United States, we will be subject to a variety of regulations in other jurisdictions governing, among other things, clinical trials and any commercial sales and distribution of our products. Because biologically sourced raw materials are subject to unique contamination risks, their use may be restricted in some countries. Whether or not we obtain FDA approval for a product, we must obtain the requisite approvals from regulatory authorities in foreign countries prior to the commencement of clinical trials or marketing of the product in those countries. Certain countries outside of the United States have a similar process that requires the submission of a clinical trial application much like the IND prior to the commencement of human clinical trials.

In the European Union, for example, a clinical trial application (CTA) must be submitted to each country's national health authority and an independent ethics committee, much like the FDA and the IRB, respectively. Once the CTA is approved in accordance with the applicable requirements, clinical trial development may proceed. The

requirements and process governing the conduct of clinical trials, are to a significant extent harmonized at the European Union-level but could vary from country to country. In all cases, the clinical trials are conducted in accordance with GCP and the applicable regulatory requirements and the ethical principles that have their origin in the Declaration of Helsinki. The way clinical trials are conducted in the European Union will undergo a major change when the Clinical Trial Regulation (Regulation (EU) 536/2014) comes into application, probably in 2022. The Regulation harmonizes the assessment and supervision processes for clinical trials throughout the European Union via a Clinical Trials Information System, which will contain a centralized European Union portal and database.

To obtain regulatory approval of an investigational biological product under European Union regulatory systems, we must submit a marketing authorization application. The application used to file the BLA in the United States is similar to that required in the European Union, with the exception of, among other things, country-specific document requirements. Innovative products that target an unmet medical need may be eligible for a number of expedited development and review programs in the European Union, such as the PRIME scheme, which provides incentives similar to the breakthrough therapy designation in the United States. Such products are generally eligible for accelerated assessment and may also benefit from different types of fast track approvals, such as a conditional marketing authorization or a marketing authorization under exceptional circumstances granted on the basis of less comprehensive clinical data than normally required (respectively in the likelihood that the sponsor will provide such data within an agreed timeframe or when comprehensive data cannot be obtained even after authorization).

The European Union also provides opportunities for market exclusivity. For example, in the European Union, upon receiving marketing authorization, new chemical entities generally receive eight years of data exclusivity and an additional two years of market exclusivity. If granted, data exclusivity prevents regulatory authorities in the European Union from referencing the innovator's data to assess a generic or biosimilar application. During the additional two-year period of market exclusivity, a generic or biosimilar marketing authorization can be submitted, and the innovator's data may be referenced, but no generic or biosimilar product can be marketed until the expiration of the market exclusivity. However, there is no guarantee that a product will be considered by the European Union's regulatory authorities to be a new chemical entity, and products may not qualify for data exclusivity. Products receiving orphan designation in the European Union can receive ten years of market exclusivity, during which time no similar medicinal product for the same indication may be placed on the market. An orphan product can also obtain an additional two years of market exclusivity in the European Union for pediatric trials. No extension to any supplementary protection certificate can be granted on the basis of pediatric trials for orphan indications.

The criteria for designating an "orphan medicinal product" in the European Union are similar in principle to those in the United States. Under Article 3 of Regulation (EC) 141/2000, a medicinal product may be designated as orphan if (1) it is intended for the diagnosis, prevention or treatment of a life-threatening or chronically debilitating condition; (2) either (a) such condition affects no more than five in 10,000 persons in the European Union when the application is made, or (b) the product, without the benefits derived from orphan status, would not generate sufficient return in the European Union to justify investment; and (3) there exists no satisfactory method of diagnosis, prevention or treatment of such condition authorized for marketing in the European Union, or if such a method exists, the product will be of significant benefit to those affected by the condition, as defined in Regulation (EC) 847/2000. Orphan medicinal products are eligible for financial incentives such as reduction of fees or fee waivers and are, upon grant of a marketing authorization, entitled to ten years of market exclusivity for the approved therapeutic indication. The application for orphan drug designation must be submitted before the application for marketing authorization. The applicant will receive a fee reduction for the marketing authorization application if the orphan drug designation has been granted, but not if the designation is still pending at the time the marketing authorization is submitted. Orphan drug designation does not convey any advantage in, or shorten the duration of, the regulatory review and approval process.

The 10-year market exclusivity may be reduced to six years if, at the end of the fifth year, it is established that the product no longer meets the criteria for orphan designation, for example, if the product is sufficiently profitable not to justify maintenance of market exclusivity. Additionally, marketing authorization may be granted to a similar product for the same indication at any time if:

- The second applicant can establish that its product, although similar, is safer, more effective or otherwise clinically superior;
- The applicant consents to a second orphan medicinal product application; or
- The applicant cannot supply enough orphan medicinal product.

The medicinal products we are developing, which are based on genes, cells or tissues, may be considered advanced therapy medicinal products (ATMPs) in the European Union if they meet the scientific criteria for defining an ATMP. The principles of the aforementioned medicines legislation apply to ATMPs. All ATMPs must obtain a marketing authorization from the EMA and are regulated through the centralized authorization procedure. Regulation (EC) No 1394/2007 (the ATMP Regulation) provides specific incentives to accelerate the development of such products, including fee reductions for scientific advice, an ATMP classification procedure (for all developers) and a certification procedure for quality and preclinical data (for SMEs only).

If tissues and cells are being used as starting materials in a medicinal product we may also need to comply with the requirements of Directive 2004/23/EC (the European Tissues and Cells Directive) covering standards for donation, procurement and testing, processing, preservation, storage and distribution of human tissues and cells, as well as its technical implementing directives; and Directive 2015/566, as regards the procedures for verifying the equivalent standards of quality and safety of imported tissues and cells.

In the European Union, early access mechanisms for innovative medicines (such as compassionate use programs and named patient supplies), pricing and reimbursement and promotion and advertising are subject to national regulations and oversight by national competent authorities and therefore significantly vary from country to country.

Sanctions for non-compliance with the aforementioned requirements, which may include administrative and criminal penalties, are generally determined and enforced at national level. However, under the European Union financial penalties regime, the EMA can investigate and report on alleged breaches of the European Union pharmaceutical rules by holders of a marketing authorization for centrally authorized medicinal products and the European Commission could adopt decisions imposing significant financial penalties on infringing marketing authorization holders.

The United Kingdom left the European Union on January 31, 2020 (Brexit). Following the Transition Period which ended on December 31, 2020, Brexit could materially impact the regulatory regime with respect to the development, manufacture, importation, approval and commercialization of our product candidates in the United Kingdom in the coming years.

For other countries outside of the European Union, such as countries in Eastern Europe, Latin America or Asia, the requirements governing the conduct of clinical trials, product licensing, pricing and reimbursement vary from country to country. In all cases, again, the clinical trials are conducted in accordance with GCP and the applicable regulatory requirements and the ethical principles that have their origin in the Declaration of Helsinki.

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

Other Healthcare Laws

Pharmaceutical companies are subject to additional healthcare regulation and enforcement by the federal government and by authorities in the states and foreign jurisdictions in which they conduct their business and may constrain the financial arrangements and relationships through which we research, sell, market and distribute any products for which we obtain marketing approval. Such laws include, without limitation, federal and state anti-kickback, fraud and abuse, false claims, data privacy and security, price reporting and physician and other health care provider transparency laws and regulations. If our operations are found to be in violation of any of such laws or any other governmental regulations that apply, we may be subject to penalties, including, without limitation, administrative, civil and criminal penalties, damages, fines, disgorgement, the curtailment or restructuring of operations, integrity oversight and reporting obligations, exclusion from participation in federal and state healthcare programs and imprisonment.

The federal Anti-Kickback Statute prohibits, among other things, any person or entity, from knowingly and willfully offering, paying, soliciting or receiving any remuneration, directly or indirectly, overtly or covertly, in cash or in kind, to induce or in return for purchasing, leasing, ordering or arranging for the purchase, lease or order of any item or service reimbursable under Medicare, Medicaid or other federal healthcare programs. The term remuneration has been interpreted broadly to include anything of value. The Anti-Kickback Statute has been interpreted to apply to arrangements between pharmaceutical manufacturers on the one hand and prescribers, purchasers and formulary managers on the other. There are a number of statutory exceptions and regulatory safe harbors protecting some common activities from prosecution. The exceptions and safe harbors are drawn narrowly and practices that involve remuneration that may be alleged to be intended to induce prescribing, purchasing or recommending may be subject to scrutiny if they do not qualify

for an exception or safe harbor but the exceptions and safe harbors are drawn narrowly and require strict compliance in order to offer protection. Failure to meet all of the requirements of a particular applicable statutory exception or regulatory safe harbor does not make the conduct per se illegal under the Anti-Kickback Statute. Instead, the legality of the arrangement will be evaluated on a case-by-case basis based on a cumulative review of all of its facts and circumstances.

Additionally, the intent standard under the Anti-Kickback Statute and the criminal healthcare fraud statutes under the federal Health Insurance Portability and Accountability Act of 1996 (HIPAA) was amended by the ACA to a stricter standard such that a person or entity no longer needs to have actual knowledge of the statute or specific intent to violate it in order to have committed a violation. In addition, the ACA codified case law that a claim including items or services resulting from a violation of the federal Anti-Kickback Statute constitutes a false or fraudulent claim for purposes of the federal False Claims Act (FCA) (discussed below).

The FCA prohibits, among other things, any person or entity from knowingly presenting, or causing to be presented, a false claim for payment to, or approval by, the federal government or knowingly making, using or causing to be made or used a false record or statement material to a false or fraudulent claim to the federal government. As a result of a modification made by the Fraud Enforcement and Recovery Act of 2009, a claim includes "any request or demand" for money or property presented to the U.S. government. Pharmaceutical and other healthcare companies have been prosecuted under these laws for allegedly providing free product to customers with the expectation that the customers would bill federal programs for the product and for causing false claims to be submitted because of the companies' marketing of the product for unapproved, and thus non-covered, uses.

HIPAA also created new federal criminal statutes that prohibit knowingly and willfully executing, or attempting to execute, a scheme to defraud or to obtain, by means of false or fraudulent pretenses, representations or promises, any money or property owned by, or under the control or custody of, any healthcare benefit program, including private third-party payors and knowingly and willfully falsifying, concealing or covering up by trick, scheme or device, a material fact or making any materially false, fictitious or fraudulent statement in connection with the delivery of or payment for healthcare benefits, items or services. Also, many states have similar fraud and abuse statutes or regulations that apply to items and services reimbursed under Medicaid and other state programs, or, in several states, apply regardless of the payor.

Additionally, the federal Physician Payments Sunshine Act within the ACA, and its implementing regulations, require that certain manufacturers of drugs, devices, biological and medical supplies for which payment is available under Medicare, Medicaid or the Children's Health Insurance Program (with certain exceptions) annually report information related to certain payments or other transfers of value made or distributed to physicians (defined to include doctors, dentists, optometrists, podiatrists and chiropractors) and teaching hospitals and certain ownership and investment interests held by these healthcare providers and their immediate family members. Beginning in 2022, applicable manufacturers also will be required to report information regarding its payments and other transfers of value to physician assistants, nurse practitioners, clinical nurse specialists, anesthesiologist assistants, certified registered nurse anesthetists and certified nurse midwives during the previous year.

We may also be subject to data privacy and security regulations by both the federal government and the states in which we conduct our business. HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act (HITECH) and its implementing regulations, impose requirements on covered entities, including certain healthcare providers, health plans, healthcare clearinghouses and their respective business associates that create, receive, maintain or transmit individually identifiable health information for or on behalf of a covered entity as well as their covered subcontractors relating to the privacy, security and transmission of individually identifiable health information. Among other things, HITECH makes HIPAA's privacy and security standards directly applicable to business associates, independent contractors or agents of covered entities that receive or obtain protected health information in connection with providing a service on behalf of a covered entity. HITECH also created four new tiers of civil monetary penalties, amended HIPAA to make civil and criminal penalties directly applicable to business associates, and gave state attorneys general new authority to file civil actions for damages or injunctions in federal courts to enforce the federal HIPAA laws and seek attorneys' fees and costs associated with pursuing federal civil actions. In addition, state laws govern the privacy and security of health information in specified circumstances, many of which differ from each other in significant ways and may not have the same effect, thus complicating compliance efforts.

In order to distribute products commercially, we must comply with state laws that require the registration of manufacturers and wholesale distributors of pharmaceutical products in a state, including, in certain states, manufacturers and distributors who ship products into the state even if such manufacturers or distributors have no place of business within the state. Some states also impose requirements on manufacturers and distributors to establish the pedigree of product in

the chain of distribution, including some states that require manufacturers and others to adopt new technology capable of tracking and tracing product as it moves through the distribution chain. Several states have enacted legislation requiring pharmaceutical companies to establish marketing compliance programs, file periodic reports with the state, make periodic public disclosures on sales, marketing, pricing, track and report gifts, compensation and other remuneration made to physicians and other healthcare providers, clinical trials and other activities, and/or register their sales representatives, as well as to prohibit pharmacies and other healthcare entities from providing certain physician prescribing data to pharmaceutical companies for use in sales and marketing, and to prohibit certain other sales and marketing practices. All of our activities are potentially subject to federal and state consumer protection and unfair competition laws.

If our operations are found to be in violation of any of the federal and state healthcare laws described above or any other governmental regulations that apply to us, we may be subject to significant penalties, including without limitation, civil, criminal and/or administrative penalties, damages, fines, disgorgement, imprisonment, exclusion from participation in government programs, such as Medicare and Medicaid, injunctions, private "qui tam" actions brought by individual whistleblowers in the name of the government, or refusal to allow us to enter into government contracts, contractual damages, reputational harm, administrative burdens, diminished profits and future earnings, and the curtailment or restructuring of our operations, any of which could adversely affect our ability to operate our business and our results of operations

Coverage and Reimbursement

Sales of any product depend, in part, on the extent to which such product will be covered by third-party payors, such as federal, state and foreign government healthcare programs, commercial insurance and managed healthcare organizations, and the level of reimbursement for such product by third-party payors. Decisions regarding the extent of coverage and amount of reimbursement to be provided are made on a plan-by-plan basis. Reimbursement by a third-party payor may depend upon a number of factors, including the third-party payor's determination that a product is safe, effective and medically necessary; appropriate for the specific patient; cost-effective; supported by peer-reviewed medical journals; included in clinical practice guidelines; and neither cosmetic, experimental, nor investigational. A third-party payor could also require that certain lines of therapy be completed or failed prior to reimbursing our therapy. The principal decisions about reimbursement for new medicines are typically made by the Centers for Medicare & Medicaid Services (CMS), an agency within the U.S. Department of Health and Human Services (HHS). CMS decides whether and to what extent products will be covered and reimbursed under Medicare and private payors tend to follow CMS to a substantial degree. Third-party payors determine which products and procedures they will cover and establish reimbursement levels. Even if a third-party payor covers a particular product or procedure, the resulting reimbursement payment rates may not be adequate. These third-party payors are increasingly reducing coverage and reimbursement for medical products, drugs and services. In addition, the U.S. government, state legislatures and foreign governments have continued implementing cost-containment programs, including price controls, restrictions on coverage and reimbursement and requirements for substitution of generic products. Adoption of price controls and cost-containment measures, and adoption of more restrictive policies in jurisdictions with existing controls and measures, could further limit sales of any product. Decreases in third-party reimbursement for any product or a decision by a third-party payor not to cover a product could reduce physician usage and patient demand for the product and also have a material adverse effect on sales.

Healthcare Reform

In the United States, in March 2010, the ACA was enacted, which substantially changed the way healthcare is financed by both governmental and private insurers, and significantly affected the pharmaceutical industry. The ACA contained a number of provisions, including those governing enrollment in federal healthcare programs, reimbursement adjustments and changes to fraud and abuse laws. For example, the ACA:

- increased the minimum level of Medicaid rebates payable by manufacturers of brand name drugs from 15.1% to 23.1% of the average manufacturer price;
- required collection of rebates for drugs paid by Medicaid managed care organizations;
- required manufacturers to participate in a coverage gap discount program, under which they must agree to offer 70% point-of-sale discounts off negotiated prices of applicable brand drugs to eligible beneficiaries during their coverage gap period, as a condition for the manufacturer's outpatient drugs to be covered under Medicare Part D;
- imposed a non-deductible annual fee on pharmaceutical manufacturers or importers who sell "branded prescription drugs" to specified federal government programs;
- expanded the entities eligible for discounts under the Public Health Service pharmaceutical pricing program; and

- created a new Patient-Centered Outcomes Research Institute to oversee, identify priorities in and conduct comparative clinical effectiveness research, along with funding for such research.

There have been executive, judicial and Congressional challenges to certain aspects of the ACA. For example, the Tax Act was enacted, which includes a provision repealing, 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 that is commonly referred to as the "individual mandate." On December 14, 2018, a U.S. District Court Judge in the Northern District of Texas ruled that the individual mandate is a critical and inseverable feature of the ACA, and therefore, because it was repealed as part of the Tax Act, the remaining provisions of the ACA are invalid as well. Additionally, on December 18, 2019, the U.S. Court of Appeals for the 5th Circuit ruled that that the individual mandate was unconstitutional and remanded the case back to the District Court to determine whether the remaining provisions of the ACA are invalid as well. On June 17, 2021, the U.S. Supreme Court dismissed a challenge on procedural grounds that argued the ACA is unconstitutional in its entirety because the "individual mandate" was repealed by Congress. Thus, the ACA will remain in effect in its current form. President Biden issued an executive order to initiate a special enrollment period from February 15, 2021 through August 15, 2021 for purposes of obtaining health insurance coverage through the ACA marketplace. The executive order also instructs 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. It is unclear how the Supreme Court ruling, other such litigation and the healthcare reform measures of the Biden administration will impact the ACA and our business.

Other legislative changes have also been proposed and adopted in the United States since the ACA was enacted. On August 2, 2011, the Budget Control Act of 2011, among other things, included aggregate reductions to Medicare payments to providers of 2% per fiscal year, which went into effect on April 1, 2013. However, COVID-19 relief legislation suspended the 2% Medicare sequester from May 1, 2020 through December 31, 2021. In January 2013, the American Taxpayer Relief Act of 2012 was signed into law, which, among other things, further reduced Medicare payments to several providers, including hospitals, imaging centers and cancer treatment centers, and increased the statute of limitations period for the government to recover overpayments to providers from three to five years.

There has been heightened governmental scrutiny recently over the manner in which pharmaceutical companies set prices for their marketed products, which has resulted in several Congressional inquiries and proposed federal legislation, as well as state efforts, designed to, among other things, bring more transparency to product pricing, reduce the cost of prescription drugs under Medicare, review the relationship between pricing and manufacturer patient programs, and reform government program reimbursement methodologies for drug products. The likelihood of success of these and other measures initiated by the former Trump administration is uncertain, particularly in light of the Biden administration. 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.

We anticipate that these new laws will result in additional downward pressure on coverage and the price that we receive for any approved product, and could seriously harm our business. Any reduction in reimbursement from Medicare and 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 (if approved). In addition, it is possible that there will be further legislation or regulation that could harm our business, financial condition and results of operations. For example, it is possible that additional governmental action is taken in response to address the COVID-19 pandemic.

Other Privacy and Security Laws

We may become subject to privacy laws in the jurisdictions in which we are established or in which we sell or market our products or run clinical trials. For example, in Europe we may be subject to Regulation (EU) 2016/679, the General Data Protection Regulation (GDPR) in relation to our collection, control, processing and other use of personal data (i.e., data relating to an identifiable living individual). The GDPR is directly applicable in each European Union Member State, however, it provides that European Union Member States may introduce further conditions, including limitations that could limit our ability to collect, use and share personal data (including health and medical information), or could cause our compliance costs to increase, ultimately having an adverse impact on our business.

The GDPR imposes onerous accountability obligations requiring data controllers and processors to maintain a record of their data processing and implement policies as part of its mandated privacy governance framework. It also requires data controllers to be transparent and disclose to data subjects (in a concise, intelligible and easily accessible form) how their personal information is to be used, imposes limitations on retention of personal data; defines pseudonymized (i.e., key-coded) data; introduces mandatory data breach notification requirements; and sets higher standards for data controllers to demonstrate that they have obtained valid consent for certain data processing activities. We are subject to the supervision of local data protection authorities in those European Union jurisdictions where we are established or otherwise subject to the GDPR. Fines for certain breaches of the GDPR are significant: up to the greater of €20 million or 4% of total global annual turnover. Further, following the withdrawal of the United Kingdom from the European Union on January 31, 2020, pursuant to the transitional arrangements agreed between the United Kingdom and the European Union, we will have to comply with the GDPR and separately the GDPR as implemented in the United Kingdom, each regime having the ability to fine up to the greater of €20 million/ £17 million or 4% of global turnover. The relationship between the United Kingdom and the European Union in relation to certain aspects of data protection law remains unclear, including how data transfers between European Union member states and the United Kingdom will be treated. These changes may lead to additional compliance costs and could increase our overall risk. In addition to the foregoing, a breach of the GDPR or other applicable privacy and data protection laws and regulations could result in regulatory investigations, reputational damage, orders to cease/change our use of data, enforcement notices, or potential civil claims including class action type litigation.

In addition, the GDPR includes restrictions on cross-border data transfers. Certain aspects of cross-border data transfers under the GDPR are uncertain as the result of legal proceedings in the European Union, including a recent decision by the Court of Justice for the European Union that invalidated the EU-U.S. Privacy Shield and, to some extent, called into question the efficacy and legality of using standard contract clauses. This may increase the complexity of transferring personal data across borders. The GDPR will increase our responsibility and liability in relation to personal data that we process where such processing is subject to the GDPR, and we may be required to put in place additional mechanisms to ensure compliance with the GDPR, including as implemented by individual countries. We are also subject to European Union rules with respect to cross-border transfers of personal data out of the European Union and European Economic Area (EEA). Recent legal developments in the European Union have created complexity and uncertainty regarding transfers of personal data from the EEA to the United States. On July 16, 2020, the Court of Justice of the European Union (CJEU) invalidated the EU-US Privacy Shield Framework (Privacy Shield) under which personal data could be transferred from the EEA to US entities who had self-certified under the Privacy Shield scheme. While the CJEU upheld the adequacy, subject to certain conditions, of the standard contractual clauses (a standard form of contract approved by the European Commission as an adequate personal data transfer mechanism), future regulatory guidance could result in changes to the use of standard contractual clauses. As supervisory authorities issue further guidance on personal data export mechanisms, including circumstances where the standard contractual clauses cannot be used, and/or start taking enforcement action, we could suffer additional costs, complaints and/or regulatory investigations or fines, and/or if we are otherwise unable to transfer personal data between and among countries and regions in which we operate, it could affect the manner in which we provide our services, the geographical location or segregation of our relevant systems and operations, and could adversely affect our financial results.

Further, the vote in the United Kingdom in favor of exiting the European Union, referred to as Brexit, has created uncertainty with regard to data protection regulation in the United Kingdom. Specifically, while the Data Protection Act of 2018, which "implements" and complements the GDPR achieved Royal Assent on May 23, 2018 and is now effective in the United Kingdom, aspects of data protection in the United Kingdom, such as the transfer of data from the EEA to the United Kingdom, remain uncertain. During the period of "transition" (i.e., until December 31, 2020), European Union law will continue to apply in the United Kingdom, including the GDPR, after which the GDPR will be converted into United Kingdom law. Beginning in 2021, the United Kingdom will be a "third country" under the GDPR.

In addition, California recently enacted the California Consumer Privacy Act (CCPA), which creates new individual privacy rights for California consumers (as defined in the law) and places increased privacy and security obligations on entities handling certain personal data of consumers or households. The CCPA requires covered companies to provide new disclosure to consumers about such companies' data collection, use and sharing practices, provide such consumers new ways to opt-out of certain sales or transfers of personal information, and provide consumers with additional causes of action. The CCPA provides for civil penalties for violations, as well as a private right of action for certain data breaches that result in the loss of personal information. This private right of action may increase the likelihood of, and risks associated with, data breach litigation. The CCPA became effective on January 1, 2020, and (i) allows enforcement by the California Attorney General, with fines set at $2,500 per violation (i.e., per person) or $7,500 per intentional violation and (ii) authorizes private lawsuits to recover statutory damages for certain data breaches. In addition, laws in all 50 U.S. states require businesses to provide notice to consumers whose personal information has been disclosed as a result of a data

breach. State laws are changing rapidly and there is discussion in the U.S. Congress of a new comprehensive federal data privacy law to which we would become subject if it is enacted. The CCPA may impact our business activities and exemplifies the vulnerability of our business to the evolving regulatory environment related to personal data and protected health information. Further, the California Privacy Rights Act (the CPRA) recently passed in California. The CPRA will impose additional data protection obligations on covered businesses, including additional consumer rights processes, limitations on data uses, new audit requirements for higher risk data, and opt outs for certain uses of sensitive data. It will also create a new California data protection agency authorized to issue substantive regulations and could result in increased privacy and information security enforcement. The majority of the provisions will go into effect on January 1, 2023, and additional compliance investment and potential business process changes may be required.

The U.S. Foreign Corrupt Practices Act

The U.S. Foreign Corrupt Practices Act of 1977 (FCPA), prohibits any U.S. individual or business from paying, offering, or authorizing payment or offering of anything of value, directly or indirectly, to any foreign official, political party or candidate for the purpose of influencing any act or decision of the foreign entity in order to assist the individual or business in obtaining or retaining business. The FCPA also obligates companies whose securities are listed in the United States to comply with accounting provisions requiring us to maintain books and records that accurately and fairly reflect all transactions of the corporation, including international subsidiaries, and to devise and maintain an adequate system of internal accounting controls for international operations.

Employees and Human Capital Management

Our Mission

We are a T-cell reprogramming company dedicated to the mastery of T cells to cure patients with solid tumor cancers. We strive to create an environment where everyone can do the best work of their lives, be themselves and thrive personally and professionally. Our culture is grounded by innovative science and demands excellence. Patients are waiting for new, innovative and effective therapies, and it is this need that drives our sense of urgency to achieve our important mission.

Our Values

We believe success comes when we and our employees align our core values with our mission to translate our ground-breaking science into medicines with the potential to transform patients' lives. Our core values are:

- *Science*: We focus and execute on the critical efforts that matter most.
- *Courage*: We are bold and willing to think and act differently.
- *Respect*: We seek to understand and communicate directly, transparently and honestly.
- *Collaboration*: We work across teams to solve our most challenging problems to continually improve and learn.

Our Employees

We view our employees as a valuable assets in serving our mission. We compete in the highly competitive biotechnology industry, and attracting, retaining and developing a diverse group of talented employees is crucial to our strategy and our ability to compete effectively. We need to grow the size of our organization in order to support our current research, product development and manufacturing efforts and our future plans for commercializing our product candidates, if approved. This growth is critical to our success. There currently is a shortage of skilled individuals with substantial experience discovering, developing and manufacturing cell therapy medicines, which is likely to continue. We also operate in areas such as data capture and analytics, machine learning and artificial intelligence. As a result, competition for talent is intense and the turnover rate can be high. We face substantial competition among numerous biopharmaceutical companies and academic institutions as well as technology companies for individuals with these skills.

As of December 31, 2021, we had 219 employees, 149 of whom were engaged in research and development activities, technical operations and process sciences. Our employees are highly skilled, and many hold advanced degrees. Many of our employees have experience with the development of cell therapies. Substantially all of our employees are located in California and Washington. None of our employees are subject to a collective bargaining agreement nor represented by labor unions. We consider our relationship with our employees to be good.

Developing our employees is important, and we focus on providing training and opportunities for development and advancement. Learning and development, training and career advancement are an integral part of retaining our employees. We hold talent discussions regularly, which include promotion cycles across functions and role levels. We are in the process of creating and implementing a comprehensive talent management framework inclusive of role leveling, competencies, training by role level and competencies, development and career planning.

Since inception, our employee turnover has remained consistently below average for the U.S. life sciences industry generally, as well as for life sciences companies located in Northern California. Given our expanding operations and need to further grow our headcount to support our business, we continually assess employee turnover, recruitment initiatives, compensation and benefits programs, safety in performing critical laboratory work, diversity and other matters relevant to human capital management, and we review results with our Board of Directors on a periodic basis.

Our Compensation & Benefits

Given the highly competitive nature of our industry and the importance of recruitment and retention to our success, we strive to provide our employees with what we believe is a competitive and comprehensive total rewards package of compensation, benefits and services. This package includes at or competitive market pay, healthcare benefits for employees and family members, a flexible spending account, paid time off benefits, family leave, flexible work schedules, flexible work locations, 401(k) matching and an employee assistance program. In addition, we offer employees the benefit of equity ownership in the company through stock option grants. Our employees are also eligible to participate in an employee stock purchase plan, which offers the opportunity to purchase our common stock at a discount of at least 15%.

Our Commitment to Diversity, Belonging, Inclusion & Equity

We strongly believe in a diverse workplace where all employees can thrive in an inclusive environment free from discrimination, harassment, bias and prejudice. We aim to treat all individuals with respect and dignity and to provide all employees with equal opportunity and fair treatment. By embracing diversity and inclusion, we seek to create an organization committed to working together to develop innovative solutions consistent with our values and in support of accomplishing our mission. Not only is a diverse, equitable and inclusive mindset and culture critical to an engaged and committed workplace, but it is also imperative to understanding and meeting the needs of the patients we seek to help with our medicines.

In 2020, with the support of our Chief Executive Officer and executive leadership team, we convened a Diversity, Belonging, Inclusion and Equity (DBIE) working group comprised of a diverse group of employees tasked with designing and implementing specific initiatives to promote greater diversity, belonging, inclusion and equity at Lyell. We also engaged an experienced DBIE consultant to advise us on the design and planning of new DBIE initiatives based on expertise and external benchmarking. The DBIE working group formalized a DBIE statement, a framework, a tactical plan and advanced a commitment to the importance of DBIE. In 2022, we expect to implement a DBIE speaker series, relevant DBIE training for managers and to expand our recruiting activities to include the use of Textio, a platform that aims to reduce gender bias in role descriptions and postings, and to utilize new recruiting platforms to further diversify candidate pools. Although we are proud of our progress to date, we have and will continue to conduct relevant training and provide guidance with respect to best practices of similarly situated companies.

As of December 31, 2021, our employees were self-reportedly approximately 52.1% percent women and 39% of our employees were self-reportedly ethnically or racially diverse with 25% Asian, 5% Black or African American, 6% Hispanic or Latino and 3% of other minority groups or two or more races.

We believe in equitable pay practices and our compensation practices and philosophies are reviewed regularly. We establish components and ranges of compensation based on market and benchmark data. Within this context, we strive to pay all employees equitably within a reasonable range, taking into consideration factors such as role, market data, internal equity, job location, relevant experience, and individual and company performance. We review and analyze our compensation decisions for individual employees and our workforce as a whole on at least an annual basis. In 2021, we conducted a pay equity analysis that we believe demonstrated that our compensation practices and structure are equitable. If we identify employees with unjustified pay gaps that do not align with our pay philosophy, we review and take appropriate action to ensure fidelity between our stated philosophy and actions.

Our Efforts to Address the COVID-19 Pandemic

Employee safety and well-being is of paramount importance to us in any year and was of particular focus since 2020 in light of the evolving COVID-19 pandemic. In response to the pandemic, we have supported our employees and government efforts to curb the COVID-19 pandemic through safety and communication efforts and investments, which include:

- Creating a COVID-19 working group responsible for establishing COVID-19 safety protocols and regularly communicating updates to all employees;
- A work from home policy in which work that can be done from home is encouraged and allowed to be done from home;
- Decreasing density and increasing physical distancing in our facilities for employees working onsite using scheduling adjustments and flexibility;
- Robust cleaning protocols across all locations;
- Strict mask requirements for employees, contractors and other onsite vendors;
- Requirement that all employees and substantially all other third parties that come onsite be fully vaccinated;
- Rigorous procedures to address actual and suspected COVID-19 cases and potential exposure; and
- Limitation of all domestic and international non-essential travel for all employees.

Additionally, from time to time we have instituted additional programs during the COVID-19 pandemic to support our employees, including wellness days and subsidies to all employees for home office expenses and upgrades.

One of our top priorities during the ongoing COVID-19 pandemic remains protecting the health and well-being of our employees, customers, partners and communities. We have closely monitored the COVID-19 pandemic and have strived to follow recommended containment and mitigation measures, including the guidance from the Centers for Disease Control and Prevention (CDC), Occupational Safety and Health Administration (OSHA), the states of California and Washington (including their state OSHA programs) and applicable counties. For most of the pandemic, essential laboratory, manufacturing and support employees worked in our facilities to continue and progress experiments and manufacturing related activities. We will continue to actively monitor the situation related to the COVID-19 pandemic and may take further actions that alter our operations, including those that may be required by federal, state, or local authorities, or that we determine are in the best interests of our employees and other third parties with whom we do business.

Item 1A. 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 contained in this Annual Report on Form 10-K, including our audited condensed consolidated financial statements and unaudited condensed consolidated financial statements and the related notes and the section titled "Management's Discussion and Analysis of Financial Condition and Results of Operations." 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.

Risks Relating to Our Financial Condition, Limited Operating History and Need for Additional Capital

We are an early clinical stage biopharmaceutical company and have incurred substantial losses since our inception and anticipate that we will continue to incur substantial and increasing net losses for the foreseeable future.

Investment in biopharmaceutical product development is highly speculative because it entails substantial upfront capital expenditures and significant risk that a product candidate will fail to prove effective, gain regulatory approval or become commercially viable. We are an early clinical stage biopharmaceutical company, and we do not have any products approved by regulatory authorities and have incurred significant research, development and other expenses related to our ongoing operations and expect to continue to incur such expenses. Since our inception, we have not generated any revenue from product sales and have incurred significant net losses. Substantially all of our net losses since inception have resulted from our research and development programs and general and administrative costs associated with our operations. As of December 31, 2021, we had an accumulated deficit of $584.4 million.

We do not expect to generate revenue from product sales for the foreseeable future, if at all. We expect to continue to incur significant expenses and operating losses for the foreseeable future. We anticipate these losses to increase as we continue to research, develop and seek regulatory approvals for our product candidates, expand our manufacturing capabilities, in-license or acquire additional technologies and potentially begin to commercialize product candidates that may achieve regulatory approval. 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 revenues. Moreover, our net losses may fluctuate significantly from quarter to quarter and year to year, such that a period to period comparison of our results of operations may not be a good indication of our future performance. If any of our product candidates fails in research and development or clinical trials or does not gain regulatory approval, or, if approved, fails to achieve market acceptance, we may never become profitable. Even if we achieve profitability in the future, we may not be able to sustain profitability in subsequent periods.

We anticipate that our expenses and operating losses will increase substantially over the foreseeable future. The expected increase in expenses will be driven in large part by our ongoing activities, if and as we:

- continue preclinical and clinical development of our current and future product candidates and initiate additional preclinical studies;
- commence clinical trials of our current and future product candidates;
- advance our Gen-R, Epi-R and cell rejuvenation technology platforms as well as other research and development efforts;
- attract, hire and retain qualified personnel;
- seek regulatory approval of our current and future product candidates;
- expand our manufacturing and process development capabilities;
- expand our operational, financial and management systems;
- acquire and license technology or technology platforms;
- continue to develop, protect and defend our intellectual property portfolio; and
- incur additional legal, accounting or other expenses in operating our business, including the additional costs associated with operating as a public company.

We operate in a rapidly evolving field and have a limited operating history, which may make it difficult to evaluate the success of our business to date and to assess our future viability.

We operate in a rapidly evolving field and, having commenced operations in June 2018, have a limited operating history, which makes it difficult to evaluate our business and prospects. Our primary activities to date have included developing T-cell therapies, performing research and development, acquiring technology, entering into strategic collaboration and license agreements, enabling and executing manufacturing activities in support of our product candidate development efforts, organizing and staffing the company, business planning, establishing our intellectual property portfolio, regulatory submissions and other preparations to initiate clinical trials, raising capital and providing general and administrative support for these activities. Any predictions about our future success, performance or viability, may not be as accurate as they could be if we had a longer operating history or approved products on the market.

In addition, as a young business, we may encounter unforeseen expenses, difficulties, complications, delays and other known and unknown factors. 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 expect our financial condition and operating results to continue to fluctuate significantly from quarter to quarter and year to year due to a variety of factors, many of which are beyond our control. Accordingly, any of our quarterly or annual periods' results are not indicative of future operating performance.

We currently have no products approved for sale and have never generated revenue from product sales. We may never generate revenue from product sales or achieve profitability.

To date, we have not generated any revenues from product sales. Our ability to generate revenues from product sales and achieve profitability will depend on our ability to successfully develop and subsequently obtain regulatory approval for and commercialize, our product candidates. Our ability to generate revenues and achieve profitability also depends on a number of additional factors, including our ability to:

- successfully complete our research activities to identify the technologies and product candidates to further investigate in clinical trials;
- successfully complete development activities, including the necessary clinical trials;

- complete and submit regulatory submissions to the U.S. Food and Drug Administration (FDA), the European Medicines Agency (EMA) or other agencies and obtain regulatory approval for indications for which there is a commercial market;
- obtain coverage and adequate reimbursement from third parties, including government and private payors;
- set commercially viable prices for our products, if any;
- develop manufacturing and distribution processes for our product candidates;
- produce commercial quantities of our products at acceptable cost levels;
- maintain adequate supply of our product candidates, including the starting materials and reagents needed;
- maintain the supply of our product candidates in a manner that is compliant with global legal requirements or to the extent necessary, establish and maintain manufacturing relationships with reliable third parties;
- achieve market acceptance of our products, if any;
- attract, hire and retain qualified personnel;
- protect our rights in our intellectual property portfolio;
- develop a commercial organization capable of sales, marketing and distribution for any products we intend to sell ourselves in the markets in which we choose to commercialize on our own; and
- find suitable distribution partners to help us market, sell and distribute our approved products in other markets.

Our revenues for any product for which regulatory approval is obtained will be dependent, in part, upon the size of the markets in the territories for which we gain regulatory approval, the accepted price for the product, the ability to get reimbursement at any price and whether we own the commercial rights for that territory. In addition, we anticipate incurring significant costs associated with commercializing any approved product. As a result, even if we generate revenue from product sales, we may not become profitable and may need to obtain additional funding to continue operations. 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.

We will require substantial additional capital to achieve our goals, and a failure to obtain this necessary capital when needed could force us to delay, limit, reduce or terminate our product development or commercialization efforts.

We expect to expend substantial resources for the foreseeable future to advance and expand our research pipeline, conduct preclinical studies and pursue clinical development and manufacturing of our product candidates. We also expect to continue to expend resources for the development of our technology platforms. These expenditures will include costs associated with research and development, potentially acquiring or licensing new technologies, conducting preclinical studies and clinical trials and potentially obtaining regulatory approvals and manufacturing products, as well as marketing and selling products approved for sale, if any. We will also need to make significant expenditures to develop a commercial organization capable of sales, marketing and distribution for any products, if any, that we intend to sell ourselves in the markets in which we choose to commercialize. In addition, we may be required to make substantial payments related to our success payment agreements and other contingent consideration payments under our license and collaboration agreements. Because the design and outcome of our planned and anticipated clinical trials are highly uncertain, we cannot reasonably estimate the actual amounts necessary to successfully complete the discovery, development and commercialization of our potential product candidates and other unanticipated costs may arise.

As of December 31, 2021, we had approximately $898.3 million in cash, cash equivalents and marketable securities. Based on our current operating plan, we believe that our existing cash, cash equivalents and marketable securities will be sufficient to meet our working capital and capital expenditure needs into 2025. However, our future capital requirements and the period for which our existing resources will support our operations may vary significantly from what we expect, and we will in any event require additional capital to complete clinical development of any of our current programs.

We do not have any committed external source of funds. Additional funds may not be available when we need them on terms that are acceptable to us, or at all, and our ability to raise additional capital may be adversely impacted by potential worsening global economic conditions or conditions in the biotechnology sector of the market, including disruptions to or volatility in the credit and financial markets in the United States and worldwide resulting from the ongoing COVID-19 pandemic. If adequate funds are not available to us on a timely basis, we may be required to delay,

limit, reduce or terminate preclinical studies, clinical trials or other development activities for our product candidates or delay, limit, reduce or terminate our establishment of sales, marketing and distribution capabilities or other activities that may be necessary to commercialize our product candidates.

Our success payment obligations in our success payment agreements may result in dilution to our stockholders or may be a drain on our cash resources to satisfy the payment obligations.

We agreed to make success payments payable in cash or publicly-tradeable shares of our common stock at our discretion pursuant to our success payment agreements with Fred Hutchinson Cancer Research Center (Fred Hutch) and The Board of Trustees of the Leland Stanford Junior University (Stanford). On each contractually prescribed measurement date, we may be required to make success payments based on increases in the per share fair value of our common stock. The total amount of success payments that we may become obligated to make is currently $400.0 million and may increase in the future due to amendments of our existing success payment agreements. For information related to our success payment obligations, see the subsection titled under "Business—Collaboration, License and Success Payment Agreements" in Part I, Item 1 of this Annual Report on Form 10-K.

In order to satisfy our obligations to make these success payments, if and when they are triggered, we may issue equity or convertible debt securities that may cause dilution to our stockholders, or we may use our existing cash to satisfy the success payment obligation in cash, which may adversely affect our financial position. In addition, these success payments may impede our ability to raise money in future public offerings of debt or equity securities or to obtain a third-party line of credit.

The success payment agreements may cause operating results to fluctuate significantly from quarter to quarter and year to year, which may reduce the usefulness of our consolidated financial statements.

Our success payment obligations are recorded as liabilities on our consolidated balance sheets. Under U.S. generally accepted accounting principles (GAAP), we are required to estimate the fair value of these liabilities as of each quarter end and changes in the estimated fair value are accreted to research and development expense over the service period of the collaboration agreement. Factors that may lead to increases or decreases in the estimated fair value of this liability include, among others, changes in the value of the common stock, changes in volatility and changes in the risk-free rate. As a result, our operating results and financial condition as reported by GAAP may fluctuate significantly from quarter to quarter and from year to year and may reduce the usefulness of our GAAP consolidated financial statements. As of December 31, 2021 and December 31, 2020, the estimated fair values of the liabilities associated with the Fred Hutch success payments were $8.5 million and $8.0 million, respectively, and as of December 31, 2021 and December 31, 2020, the estimated fair values of the liabilities associated with the Stanford success payments were $9.9 million and $8.9 million, respectively.

Risks Related to Our Business and Industry

We are early in our research and development efforts and just beginning clinical development of our product candidates. If we are unable to successfully develop and commercialize product candidates or experience significant delays in doing so, our business may be harmed.

We are early in our research and development efforts and are just beginning clinical development of our product candidates. With the opening of a clinical trial site in March 2022, we have initiated our Phase 1 clinical trial of LYL797. Besides LYL797, all of our other proprietary product candidates are currently in preclinical development. We have not yet demonstrated our ability to successfully enroll and complete any clinical trials (including Phase 3 or other pivotal clinical trials), obtain regulatory approvals, manufacture a commercial scale product or arrange for a third party to do so on our behalf, or conduct sales and marketing activities necessary for successful product commercialization. We have invested substantial resources in developing our technology platforms and our product candidates, conducting preclinical studies, commencing clinical trials and building our manufacturing facilities and capabilities, each of which will be required prior to any regulatory approval and commercialization. Our ability to generate revenue from product sales, which we do not expect will occur for several years, if ever, will depend heavily on the successful research and development and eventual commercialization of one or more product candidates. The success of our efforts to identify and develop product candidates will depend on many factors, including the following:

- timely and successful completion of our preclinical and nonclinical studies and research activities to identify and develop product candidates to investigate in clinical trials;
- submission of INDs to the FDA to proceed with clinical trials, or comparable applications to foreign regulatory authorities that allow the commencement of our planned clinical trials for our product candidates;

- successful enrollment and completion of clinical trials in compliance with Good Clinical Practice (GCP) requirements with positive results;
- the level of efficacy observed with our product candidates;
- the prevalence and severity of adverse events experienced with any of our product candidates;
- successfully developing or making arrangements with third parties for, manufacturing and distribution processes for our product candidates and for commercial manufacturing and distribution for any of our product candidates that receive regulatory approval;
- receipt of timely regulatory approvals from applicable authorities for our product candidates for their intended uses;
- protecting our rights in our intellectual property portfolio, including by obtaining and maintaining patent and trade secret protection and regulatory exclusivity for our product candidates;
- establishing capabilities and infrastructure to obtain the tumor tissues needed to develop and, if successful, commercialize approved products from our TIL program;
- manufacturing our product candidates at an acceptable cost;
- launching commercial sales of our products, if approved by applicable regulatory authorities, whether alone or in collaboration with others;
- acceptance of our products, if approved by applicable regulatory authorities, by patients and the medical community;
- obtaining and maintaining coverage and adequate reimbursement by third-party payors, including government payors, for our products, if approved by applicable regulatory authorities;
- effectively competing with other marketed therapies;
- maintaining compliance with regulatory requirements, including the cGMP requirements;
- maintaining a continued acceptable benefit/risk profile of the products following approval; and
- maintaining and growing an organization of scientists and functional experts who can develop and commercialize our products and technology.

If we do not achieve one or more of these factors in a timely manner or at all, we could experience significant delays or an inability to successfully develop and commercialize our product candidates, which could harm our business. If we do not receive marketing approvals for any product candidate we develop, we may not be able to continue our operations.

Our product candidates and technology platforms are based on novel technologies that are unproven and may not result in approvable or marketable products, which exposes us to unforeseen risks and makes it difficult for us to predict the time and cost of product development and potential for regulatory approval and we may not be successful in our efforts to use and expand our technology platforms to build a pipeline of product candidates.

We are seeking to identify and develop a broad pipeline of product candidates using our proprietary technology platforms. The scientific research that forms the basis of our efforts to develop product candidates with our technology platforms is still ongoing. We are not aware of any FDA approved therapeutics utilizing similar technology. Further, the scientific evidence to support the feasibility of developing therapeutic treatments based on our technology platforms are both preliminary and limited. Additionally, although we have initiated a Phase 1 clinical trial of LYL797 with the opening of a clinical trial site in March 2022, neither we nor GSK, have tested any of our product candidates in humans, and our current data is limited to animal models and preclinical cell lines, the results of which may not translate into humans or may not accurately predict the safety and efficacy of our product candidates in humans. As a result, we are exposed to a number of unforeseen risks and it is difficult to predict the types of challenges and risks that we may encounter during development of our product candidates.

Given the novelty of our technology platforms, we intend to work closely with the FDA and comparable foreign regulatory authorities to perform the requisite scientific analyses and evaluation of our methods to obtain regulatory approval for our product candidates; however, due to a lack of relevant experiences, the regulatory pathway with the FDA and comparable regulatory authorities may be more complex and time-consuming relative to other more well-known

therapeutics. Even if we obtain human data to support our product candidates, the FDA or comparable foreign regulatory agencies may lack experience in evaluating the safety and efficacy of our product candidates developed using our technology platforms, which could result in a longer than expected regulatory review process, increase our expected development costs and delay or prevent commercialization of our product candidates. The validation process takes time and resources, may require independent third-party analyses and may not be accepted or approved by the FDA and comparable foreign regulatory authorities. There can be no assurance as to the length of clinical development, the number of patients that the FDA may require to be enrolled in clinical trials to establish the safety, purity and potency of our product candidates or the acceptability to the FDA of data generated in these clinical trials to support marketing approvals. We cannot be certain that our approach will lead to the development of approvable or marketable products, alone or in combination with other therapies.

We are highly dependent on our key personnel and, if we are not successful in attracting and retaining 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, manufacturing, scientific and medical personnel. 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, Seattle and Bothell metropolitan areas. These regions are headquarters to many other biopharmaceutical companies and many academic and research institutions. Competition for skilled personnel in these markets 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 equity that vests over time. The value to employees of equity incentives that vest over time may be significantly affected by factors 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, 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 man” 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.

Any future litigation or adversarial proceedings against us could be costly and time-consuming to defend.

We may in the future become subject to legal proceedings and claims that arise in the ordinary course of business, such as claims brought by third parties in connection with commercial disputes or employment claims made by our current or former employees. Litigation or adversarial proceedings might result in substantial costs and may divert management’s attention and resources, which might seriously harm our business, reputation, overall financial condition and operating results. Insurance might not cover such claims, might not provide sufficient payments to cover all the costs to resolve one or more such claims and might not continue to be available on terms acceptable to us. A claim brought against us that is uninsured or underinsured could result in unanticipated costs, thereby harming our business.

If we cannot maintain our company culture as we grow, our success and our business may be harmed.

We believe our culture has been a key contributor to our success to date. Any failure to preserve our culture could negatively affect our ability to retain and recruit personnel, which is critical to our growth, and to effectively focus on and pursue our objectives. As we grow and are required to implement more complex organizational management structures, we may find it increasingly difficult to maintain the beneficial aspects of our culture. If we fail to maintain our company culture, our business may be adversely affected.

We currently have no marketing, sales, or distribution infrastructure and we intend to either establish a sales and marketing infrastructure or outsource this function to a third party. Either of these commercialization strategies carries substantial risks to us.

We currently have no marketing, sales and distribution capabilities. To support commercial marketing and distribution of any of our product candidates that complete clinical development and are approved, we would either establish a sales and marketing organization with technical expertise and supporting distribution capabilities to commercialize our product candidates in a legally compliant manner or outsource this function to a third party. There are risks involved if we decide to establish our own sales and marketing capabilities or enter into arrangements with third

parties to perform these services. To the extent that we enter into collaboration agreements with respect to marketing, sales or distribution, our product revenue may be lower than if we directly marketed or sold any approved products. Such collaborative arrangements with partners may place the commercialization of our products outside of our control and would make us subject to a number of risks including that we may not be able to control the amount or timing of resources that our collaborative partner devotes to our products or that our collaborator's willingness or ability to complete its obligations, and our obligations under our arrangements may be adversely affected by business combinations or significant changes in our collaborator's business strategy.

If we are unable to enter into these arrangements on acceptable terms or at all, we may not be able to successfully commercialize any approved products. If we are not successful in commercializing any approved products, either on our own or through collaborations with one or more third parties, our future product revenue will suffer and we may incur significant additional losses, which would have a material adverse effect on our business, financial condition and results of operations.

Our business could continue to be adversely affected by the effects of health epidemics, including the COVID-19 pandemic, 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.

Our business could continue to be adversely affected by health epidemics, including the COVID-19 pandemic, 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. For example, the COVID-19 pandemic has presented a substantial public health and economic challenge around the world and is affecting employees, patients, communities and business operations, as well as the United States and international economy and financial markets. In this regard, the COVID-19 pandemic and government measures taken in response have had a significant impact, both direct and indirect, on businesses and commerce, as significant reductions in business-related activities have occurred, supply chains have been disrupted and manufacturing and clinical development activities have been impacted.

Remote work policies, quarantines, shelter-in-place and similar government orders, shutdowns or other restrictions on the conduct of business operations related to the COVID-19 pandemic could materially and adversely affect our operations. Following guidance from federal, state and local authorities, we have implemented policies that restrict the number and nature of employees who can be on site, and such policies may continue for an indefinite period. We have also implemented various safety protocols for all on-site personnel, including requiring that each employee or contractor who enters a facility be vaccinated and agree to comply with social distancing, frequent hand washing and wearing masks. In connection with these and potential future measures, we may be subject to claims based upon, arising out of or related to the COVID-19 pandemic and our actions and responses thereto, including any determinations that we have made and may make in the future with respect to our on-site operations. Further, current and future government restrictions as well as our remote work policies may materially and adversely impact productivity, disrupt our business and delay our preclinical studies and clinical trial plans, 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. We continue to evaluate the impact that the evolving effects of the COVID-19 pandemic may have on our ability to effectively conduct our business operations as planned, and while to date, we have not experienced delays in our discovery and preclinical development activities as a result of the COVID-19 pandemic, there can be no assurance that we will be able to avoid materially adverse impacts from the evolving effects of the COVID-19 pandemic. In this regard, site initiation and patient enrollment may be delayed due to prioritization of hospital resources toward the COVID-19 pandemic, which may delay enrollment in our current and planned clinical trials, and some patients may not be able to comply with clinical trial protocols if quarantines impede patient movement or interrupt healthcare services, and we may be unable to obtain blood samples for testing. For example, limitations or modifications in surgery scheduling for oncology patients at collaborating institutions has limited and may continue to limit supply of patient tumor samples that we use in our research.

The extent of the impact of the COVID-19 pandemic on our business, operations and development timelines and plans remains uncertain and will depend on future developments that cannot be predicted at this time. Such developments include the continued spread of the Delta and Omicron variants in the U.S. and other countries and the potential emergence of other SARS-CoV-2 variants that may prove especially contagious or virulent, the ultimate duration of the pandemic and the resulting impact on our clinical trial plans, CROs, contract manufacturing organizations and other third parties with whom we do business, as well as its impact on regulatory authorities and our key scientific and management personnel, and the effectiveness of actions taken globally to contain and treat the disease, including the rate at which vaccinations or boosters are made available, the percentage of the population that becomes vaccinated or boosted and the effectiveness of the vaccines or boosters against Delta, Omicron or other SARS-CoV-2 variants. We do not yet know the full extent of potential delays or impacts on our business, our planned preclinical studies or clinical trials, healthcare systems or the global economy as a whole. The foregoing and other continued disruptions to our business as a result of the evolving

effects of the COVID-19 pandemic could materially and adversely affect our business, results of operations, financial condition and cash flows. Furthermore, the evolving effects of the COVID-19 pandemic could heighten the risks in certain of the other risk factors described herein.

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 recently experienced extreme volatility and disruptions (including as a result of the ongoing COVID-19 pandemic), which has included severely diminished liquidity and credit availability, declines in consumer confidence, declines in economic growth, increases in unemployment rates and uncertainty about economic stability. The financial markets and the global economy may also be adversely affected by the current or anticipated impact of military conflict, including the conflict between Russia and Ukraine, terrorism or other geopolitical events. Sanctions imposed by the United States and other countries in response to such conflicts, including the one in Ukraine, may also adversely impact the financial markets and the global economy, and any economic countermeasures by the affected countries or others could exacerbate market and economic instability. 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, 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.

Risks Related to Manufacturing

We intend to manufacture most of each product candidate ourselves. Delays in commissioning and receiving regulatory approvals for our manufacturing facility could delay our development plans and thereby limit our ability to generate product revenues.

We have built our own manufacturing facility in Bothell, Washington. The facility is designed to support the production of preclinical and development product candidates and early commercialization of products, and ongoing facility and equipment qualification to support clinical production is required. If we are not able to qualify the facility or the appropriate regulatory approvals for the facility are delayed, we may be unable to manufacture sufficient quantities of our product candidates, if at all, which would limit our development activities and our opportunities for growth.

In addition, our manufacturing facility will be subject to ongoing, periodic inspection by the FDA, EMA, or other applicable regulatory agencies to ensure compliance with cGMPs and current Good Tissue Practices (cGTPs). Our failure to follow and document our adherence to these regulations or other regulatory requirements may lead to significant delays in the availability of products for clinical or, in the future, commercial use. This may result in the termination of or a hold on a clinical trial, or may delay or prevent filing or approval of commercial marketing applications for our product candidates. We also may encounter problems with the following:

- achieving adequate or clinical-grade materials that meet regulatory agency standards or specifications with consistent and acceptable production yield and costs;
- maintaining continuity among our key manufacturing related electronic systems;
- shortages of qualified personnel, raw materials or key contractors; and
- ongoing compliance with cGMP regulations and other requirements of the FDA, EMA, or other comparable regulatory agencies.

Failure to comply with applicable regulations could also result in sanctions being imposed on us, including fines, injunctions, civil penalties, a requirement to suspend or put on hold one or more of our clinical trials, failure of regulatory authorities to grant marketing approval of our product candidates, delays, suspension or withdrawal of approvals, license revocation, seizures or recalls of product candidates, operating restrictions and criminal prosecutions, any of which could harm our business.

Developing advanced manufacturing techniques and process controls is required to fully utilize our facility. Without further investment, advances in manufacturing techniques may render our facility and equipment inadequate or

obsolete. We may also require further investment to build additional manufacturing facilities or expand the capacity of our existing ones.

The manufacturing of cellular therapies is very complex. We are subject to a multitude of manufacturing risks, any of which could substantially increase our costs, delay our programs or limit supply of our product candidates.

Developing commercially viable manufacturing processes for cellular therapies is a difficult and uncertain task and requires significant expertise and capital investment. We are developing and implementing manufacturing processes for our product candidates. In particular, for autologous cell therapies the starting material is the patient's own cells, which inherently adds complexity and variability to the manufacturing process, and we have not yet manufactured a cellular therapy for a patient with cancer. In addition, our ability to consistently and reliably manufacture our cellular therapy product candidates is essential to our success, and there are risks associated with scaling to the level required for advanced clinical trials or commercialization, including cost overruns, potential problems with process scale-up, process reproducibility, stability issues, consistency and timely availability of reagents or raw materials. Furthermore, our manufacturing processes may have significant dependencies on third parties, which will pose additional risks to our manufacturing capabilities. Additionally, we do not yet have sufficient information to reliably estimate the cost of the commercial manufacturing and processing of our product candidates, and the actual cost to manufacture and process our product candidates could materially and adversely affect the commercial viability of our product candidates. As a result, we may never be able to develop a commercially viable product.

In addition to the factors mentioned above, the overall process of manufacturing cellular therapies is extremely susceptible to product loss due to low cell viability, contamination, equipment failure or improper installation or operation of equipment, or vendor or operator error. Even minor deviations from normal manufacturing and distribution processes for any of our product candidates could result in reduced production yields, impact to key product quality attributes and other supply disruptions. Product defects can also occur unexpectedly. These deviations and disruptions could delay our programs. If we are not able to capably manage this complexity and variability, our ability to timely and successfully provide our products candidates to patients could be delayed. In addition, the complexities of utilizing a patient's own cells as the starting material requires that we have suitable cells capable of yielding a viable cellular therapy product, which may not be possible for severely immune-compromised or heavily pre-treated patients.

The process of successfully manufacturing products for clinical testing and commercialization may be particularly challenging, even if such products otherwise prove to be safe and effective. The manufacture of these product candidates involves complex processes. Some of these processes require specialized equipment and highly skilled and trained personnel. The process of manufacturing these product candidates will be susceptible to additional risks, given the need to maintain aseptic conditions throughout the manufacturing process. Contamination with microbes, viruses or other pathogens in either the donor material or materials utilized in the manufacturing process or ingress of microbiological material at any point in the process may result in contaminated, unusable product or necessitate the closing of a manufacturing facility for an extended period of time to allow us to investigate and remedy the contamination. These types of contaminations could result in delays in the manufacture of products, which could result in delays in the development of our product candidates. These contaminations could also increase the risk of adverse side effects.

Any adverse developments affecting manufacturing operations for our product candidates may result in lot failures, inventory shortages, shipment delays, product withdrawals or recalls or other interruptions in supply that could delay the development of our product candidates. If we are unable to obtain sufficient supply of our product candidates, whether due to production shortages or other supply interruptions resulting from the ongoing COVID-19 pandemic or otherwise, our clinical trials or regulatory approval may be delayed. We may also have to write off inventory, incur other charges and expenses for supply of product that fails to meet specifications, undertake costly remediation efforts, or seek more costly manufacturing alternatives. In addition, parts of the supply chain may have long lead times or may come from a small number of suppliers. If we are not able to appropriately manage our supply chain our ability to successfully produce our product candidates could be delayed or harmed. Inability to meet the demand for our product candidates could damage our reputation and the reputation of our products among physicians, healthcare payors, patients or the medical community that supports our product development efforts, including hospitals and outpatient clinics.

Furthermore, the manufacturing facilities in which our product candidates will be made could be adversely affected by earthquakes and other natural disasters, equipment failures, labor shortages, power failures, health epidemics and numerous other factors. If any of these events were to occur and impact our manufacturing facilities, our business would be materially and adversely affected.

If our sole clinical or commercial manufacturing facility or our contract manufacturing organization is damaged or destroyed or production at these facilities is otherwise interrupted, our business would be negatively affected.

If any manufacturing facility in our manufacturing network, or the equipment in these facilities, is either damaged or destroyed, we may not be able to quickly or inexpensively replace our manufacturing capacity, if we are able to replace it at all. In the event of a temporary or protracted loss of a facility or its equipment, we may not be able to transfer manufacturing to a third party in the time required to maintain supply. Even if we could transfer manufacturing to a third party, the shift would likely be expensive and time-consuming, particularly since the new facility would need to comply with the necessary regulatory requirements or may require regulatory approval before selling any products manufactured at that facility. Such an event could substantially delay our clinical trials or commercialization of our product candidates.

Currently, we maintain insurance coverage against damage to our property and to cover business interruption and research and development restoration expenses. However, our insurance coverage may not reimburse us, or may not be sufficient to reimburse us, for any expenses or losses we may suffer. We may be unable to meet our requirements for our product candidates if there were a catastrophic event or failure of our current manufacturing facility or processes.

If we are unable to develop or scale our own manufacturing, we may have to rely on third parties to manufacture our product candidates, which subjects us to risks and could delay or prevent our development and/or commercialization, if approved, of our product candidates.

If we are unable to develop or scale our own manufacturing capabilities for our product candidates, we will be reliant on third parties to manufacture our product candidates. We may be unable to identify manufacturers for our product candidates or the materials required to develop the cellular therapy on acceptable terms or at all because the number of potential manufacturers is limited. Engaging a third-party manufacturer will require testing and regulatory interactions, and 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 manufacturers may be unable to timely formulate and manufacture our product or produce the quantity and quality required to meet our clinical and commercial needs, if any.

Furthermore, the facilities used by manufacturers are subject to ongoing periodic unannounced inspections by the FDA and corresponding state agencies to ensure strict compliance with government regulations and corresponding foreign standards, and we do not have control over third-party manufacturers' compliance with cGMPs for the manufacture of our product candidates. If our contract manufacturers cannot successfully manufacture material that conforms to our specifications and the strict regulatory requirements of the FDA or others, we will not be able to obtain and/or maintain regulatory approval for our product candidates manufactured in these facilities. In addition, we have no control over the ability of our third-party manufacturers to maintain adequate control, quality assurance and qualified personnel required to meet our clinical and commercial needs, if any. If the FDA or a comparable foreign regulatory authority does not approve the manufacture of our product candidates at these facilities or if it withdraws any such approval in the future, we may need to find alternative manufacturing facilities, which would significantly impact our ability to develop, obtain regulatory approval for or market our product candidates, if approved. In addition, any failure to achieve and maintain compliance with these laws, regulations and standards could subject us to the risk that we may have to suspend the manufacturing of our product candidates or that any approvals we have obtained could be revoked, which would adversely affect our business and reputation.

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. Also, our third- party manufacturers could breach or terminate their agreement with us because of their own financial difficulties or business priorities, at a time that is costly or otherwise inconvenient for us. If we were unable to find adequate replacement or another acceptable solution in time, our clinical trials could be delayed or our commercial activities could be harmed.

Furthermore, our third-party manufacturers would also be subject to the same risks we face in developing our own manufacturing capabilities, as described above. Each of these risks could delay our clinical trials, the approval, if any, of our product candidates by the FDA or the commercialization of our product candidates or result in higher costs or deprive us of potential product revenue.

Cell-based therapies rely on the availability of specialty raw materials, which may not be available to us on acceptable terms or at all.

Our product candidates require many specialty raw materials. As a result, we may be required to outsource aspects of our manufacturing supply chain. Many of the specialty raw materials may be manufactured by small companies with limited resources and experience to support a commercial product, and the suppliers may not be able to deliver raw

materials to our specifications. In such case, identifying and engaging an alternative supplier or manufacturer could result in delay, and we may not be able to find other acceptable suppliers or manufacturers on acceptable terms, or at all. Switching suppliers or manufacturers may involve substantial costs and is likely to result in a delay in our desired clinical and commercial timelines. If we change suppliers or manufacturers for commercial production, applicable regulatory agencies may require us to conduct additional studies or trials. If key suppliers or manufacturers are lost, or if the supply of the materials is diminished or discontinued, we may not be able to develop, manufacture and market our product candidates in a timely and competitive manner, or at all. An inability to continue to source product from any of these suppliers, which could be due to a number of issues, including regulatory actions or requirements affecting the supplier, adverse financial or other strategic developments experienced by a supplier, labor disputes or shortages, unexpected demands or quality issues, could adversely affect our ability to satisfy demand for our product candidates, which could adversely and materially affect our product sales and operating results or our ability to conduct clinical trials, either of which could significantly harm our business.

In addition, those suppliers may not have the capacity to support commercial products manufactured by biopharmaceutical firms. The suppliers may be ill-equipped to support our needs, especially in non-routine circumstances like an FDA inspection, or medical crises such as widespread contamination. We may not be able to contract with these companies on acceptable terms or at all. Accordingly, we may experience delays in receiving key raw materials to support clinical or commercial manufacturing. In addition, some raw materials are currently available from a single supplier, or a small number of suppliers. We cannot be sure that these suppliers will remain in business, or that they will not be purchased by one of our competitors or another company that is not interested in continuing to produce these materials for our intended purpose. These factors could cause the delay of studies or trials, regulatory submissions, required approvals or commercialization of product candidates that we develop, cause us to incur higher costs and prevent us from commercializing our product candidates successfully.

Risks Related to Our Dependence on Third Parties

We intend to rely on third parties to conduct, supervise and monitor a significant portion of our research and preclinical studies and clinical trials for our product candidates, and, if those third parties do not successfully carry out their contractual duties, comply with regulatory requirements or otherwise perform satisfactorily, we may not be able to obtain regulatory approval or commercialize product candidates, or such approval or commercialization may be delayed, and our business may be substantially harmed.

We intend to rely on medical institutions, clinical investigators, contract laboratories and other third parties, such as contract research organizations (CROs), to conduct GCP-compliant clinical trials on our product candidates properly and on time. For example, we are relying on a CRO to conduct a significant part of our LYL797 Phase 1 clinical trial. Negotiating budgets and contracts with CROs and study sites may result in delays to our development timelines and increased costs. Switching or adding CROs involves substantial cost and requires management time and focus. In addition, there is a natural transition period when a new CRO commences work. As a result, delays occur, which can materially impact our ability to meet our desired clinical development timelines. Though we intend to carefully manage our relationships with our CROs, there can be no assurance that we will not encounter challenges or delays in the future or that these delays or challenges will not have a material adverse impact on our business, financial condition and prospects. Further, the performance of our CROs and other third parties conducting our trials may also be interrupted or subject to delay as a result of the ongoing COVID-19 pandemic, including due to travel or quarantine policies, staff shortages due to heightened exposure of CRO or clinical site or other vendor staff to the COVID-19 pandemic or prioritization of resources toward the pandemic.

In addition, any third parties conducting our clinical trials or preclinical studies 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. 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, regulatory requirements or for other reasons, our clinical trials or preclinical studies may be extended, delayed or terminated and we may not be able to obtain regulatory approval or successfully commercialize our product candidates. Consequently, our results of operations and the commercial prospects for our product candidates would be harmed, our costs could increase substantially and our ability to generate revenue could be delayed significantly.

We rely on these parties for execution of our preclinical studies and clinical trials, and generally do not control their activities. Our reliance on these third parties for research and development activities will reduce our control over these activities but will not relieve us of our responsibilities. For example, we will remain responsible for ensuring that each of our clinical trials are conducted in accordance with the general investigational plan and protocols for the trial. Moreover,

the FDA requires us to comply with standards, commonly referred to as GCPs, for conducting, recording and reporting the results of clinical trials to assure that data and reported results are credible and accurate and that the rights, integrity and confidentiality of trial participants are protected. If we or any of our CROs or other third parties, including trial sites, fail to comply with applicable GCPs, 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. We cannot assure you that upon inspection by a given regulatory authority, such regulatory authority will determine that any of our clinical trials complies with GCP regulations. In addition, our clinical trials must be conducted with product produced under cGMP conditions. Our failure to comply with these regulations may require us to add patients to or 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.

If any of our relationships with the third parties that we currently use or that we may use in the future terminates, we may not be able to enter into arrangements with alternative third parties to do so on commercially reasonable terms. As a result, delays occur, which can materially impact our ability to meet desired research and clinical development timelines.

We do and will continue to or intend to rely on outside scientists and their third-party research institutions for research and development and early clinical testing of our product candidates. These scientists and institutions may have other commitments or conflicts of interest, which could limit our access to their expertise and harm our ability to leverage our technology platforms.

We rely on our third-party research institution collaborators for some research capabilities. However, the research we are funding constitutes only a small portion of the overall research of each research institution. Other research being conducted by these institutions may at times receive higher priority than research on the programs we are funding. We typically have less control of the research, clinical trial protocols and patient enrollment than we might with activity led by our employees.

The outside scientists who conduct the research and development upon which portions of our product candidate pipeline depends, are not our employees; rather, they serve as either independent contractors or the primary investigators under research collaboration agreements that we have with their sponsoring academic or research institution. Such scientists and collaborators may have other commitments that would limit their availability to us. Although our scientific advisors generally agree not to do competing work, if an actual or potential conflict of interest between their work for us and their work for another entity arises, we may lose their services. These factors could adversely affect the timing of the clinical trials, the timing of receipt and reporting of clinical data, the timing of our IND submissions, and our ability to conduct our current and planned clinical trials. It is also possible that some of our valuable proprietary knowledge may become publicly known through these scientific advisors if they breach their confidentiality agreements with us, which would cause competitive harm to, and have an adverse effect on, our business.

We have entered into a collaboration with GlaxoSmithKline (GSK) and may form or seek collaborations or 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 have entered into a research and development collaboration with GSK for our NY-ESO-1 program and other potential product opportunities. In the future, we may also enter into additional license and collaboration arrangements. Any collaboration arrangement that we enter into is subject to numerous risks, which may include the following:

- the collaborator has significant discretion in determining the efforts and resources that they will apply to a program or product candidate under the collaboration;
- the collaborator may not pursue development and commercialization of our product candidates or may elect not to continue or renew development or commercialization programs based on clinical trial results, changes in their strategic focus due to the acquisition of competitive products, availability of funding or other external factors, such as a business combination that diverts resources or creates competing priorities;
- the collaborator may delay clinical trials, provide insufficient funding for a clinical trial, preferentially enroll patients on a portion of a clinical trial not testing our product candidates, stop a clinical trial, abandon a product candidate, repeat or conduct new clinical trials, or require a new formulation of a product candidate for clinical testing;
- the collaborator could independently develop, or develop with third parties, products that compete directly or indirectly with our products or product candidates;

- the collaborator may not commit sufficient resources to marketing and distribution of our products;
- the collaborator may not properly maintain or defend our intellectual property rights or may use our intellectual property or proprietary information in a way that gives rise to actual or threatened litigation that could jeopardize or invalidate our intellectual property or proprietary information or expose us to potential liability;
- disputes may arise between us and the collaborator that cause the delay or termination of the research, development or commercialization of our product candidates, or that result in costly litigation or arbitration that diverts management attention and resources;
- the collaboration may be terminated and, if terminated, may result in a need for additional capital to pursue further development or commercialization of the applicable product candidates; and
- the collaborator may own or co-own intellectual property covering our product candidates that results from our collaborating with them, and in such cases, we would not have the exclusive right to commercialize such intellectual property.

In particular, failure by GSK to meet each of its obligations under our collaboration agreement or failure by GSK to apply sufficient efforts at developing and commercializing collaboration products may adversely affect our business and our results of operations. GSK could independently develop, or develop with its other third party collaborators, products or product candidates that compete directly or indirectly with our products or product candidates and that could adversely impact GSK's willingness to exercise an option under our collaboration or GSK's level of diligence for our collaboration products for which it has exercised an option. Additionally, GSK's exercise of an option for a program that includes a given product candidate may also lead to changes to clinical and regulatory development strategy for such product candidate, at GSK's discretion, which may impact development timelines for such product candidate and may adversely affect the value of our stock. GSK will also require some level of assistance from us with respect to product candidates for which it exercises an option, and this assistance could be burdensome on our organization and resources and disrupt our own development and commercialization activities for product candidates for which we retain rights.

We may form or seek further strategic alliances, create joint ventures or collaborations, or enter into additional licensing arrangements with third parties that we believe will complement or augment our development and commercialization efforts with respect to our product candidates, our research and any future product candidates that we may pursue. Such alliances will be subject to many of the risks set forth above. Moreover, 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.

As a result of these risks, we may not be able to realize the benefit of our existing collaboration or any future collaborations or licensing agreements we may enter into. Any delays in entering into new collaborations or strategic partnership agreements related to our product candidates could delay the development and commercialization of our product candidates in certain geographies for certain indications, which would harm our business prospects, financial condition and results of operations.

We may not realize the benefits of potential future collaborations, licenses, product acquisitions or other strategic transactions.

We have entered into, and may desire to enter into in the future, collaborations, licenses or other strategic transactions for the acquisition of products or business opportunities, in each case where we believe such arrangement will complement or augment our existing business. These relationships or transactions, or those like them, may require us to incur nonrecurring and other charges, increase our near- and long-term expenditures, issue securities that dilute our existing stockholders, reduce the potential profitability of the products that are the subject of the relationship or disrupt our management and business. For example, we entered into a collaboration agreement and stock purchase agreement with PACT Pharma, Inc. (PACT) in June 2020 and, in February 2021, we filed a demand for arbitration seeking to, among other things, rescind the agreements with PACT and recover the consideration paid thereunder. In addition, we face significant competition in seeking appropriate strategic alliances and transactions and the negotiation process is time-consuming and complex and there can be no assurance that we can enter into any of these transactions even if we desire to do so. Moreover, we may not be successful in our efforts to establish a strategic alliance or other alternative arrangements for any future product candidates and programs because our research and development pipeline may be insufficient, our product candidates or programs may be deemed to be at too early a stage of development for collaborative effort and third parties may not view our product candidates and programs as having the requisite potential to demonstrate a positive benefit/risk

profile. Any delays in entering into new strategic alliance agreements related to our product candidates could also delay the development and commercialization of our product candidates and reduce their competitiveness even if they reach the market.

If we license products or acquire businesses, we may not be able to realize the benefit of these transactions if we are unable to successfully integrate them with our existing operations and company culture. There are other risks and uncertainties involved in these transactions, including unanticipated liabilities related to acquired intellectual property rights, products or companies and disruption in our relationship with collaborators or suppliers as a result of such a transaction. We cannot be certain that, following an acquisition or license, we will achieve the financial or strategic results that would justify the transaction.

We will depend on enrollment and retention of patients in our current and planned clinical trials for our product candidates. If we experience delays or difficulties enrolling or retaining patients in our clinical trials, our research and development efforts and business, financial condition, and results of operations could be materially adversely affected.

Successful and timely completion of clinical trials will require that we enroll and retain a sufficient number of patient candidates. Any clinical trials we conduct may be subject to delays for a variety of reasons, including as a result of patient enrollment taking longer than anticipated, patient withdrawal, or adverse events. These types of developments could cause us to delay the trial or halt further development.

Our clinical trials will compete with other clinical trials that are in the same therapeutic areas as our product candidates, and this competition reduces the number and types of patients available to us, as some patients who might have opted to enroll in our trials may instead opt to enroll in a trial being conducted by one of our competitors. Moreover, enrolling patients in clinical trials for diseases in which there is an approved standard of care is challenging, as patients will first receive the applicable standard of care. Many patients who respond positively to the standard of care do not enroll in clinical trials. This may limit the number of eligible patients able to enroll in our clinical trials who have the potential to benefit from our product candidates and could extend development timelines or increase costs for these programs. Patients who fail to respond positively to the standard of care treatment will be eligible for clinical trials of unapproved drug candidates. However, these prior treatment regimens may render our therapies less effective in clinical trials.

Because the number of qualified clinical investigators and clinical trial sites is limited, we expect to conduct some of our clinical trials at the same clinical trial sites that some of our competitors use, which will reduce the number of patients who are available for our clinical trials at such clinical trial sites.

Patient enrollment depends on many factors, including:

- the size and nature of the patient population;
- the severity of the disease under investigation;
- eligibility criteria for the trial;
- the proximity of patients to clinical sites;
- the design of the clinical protocol;
- the ability to obtain and maintain patient consents;
- perceived risks and benefits of the product candidate under evaluation, including any perceived risks associated with genetically modified product candidates;
- the ability to recruit clinical trial investigators with the appropriate competencies and experience;
- the risk that patients enrolled in clinical trials will drop out of the trials before the administration of our product candidates or trial completion;
- the availability of competing clinical trials;
- the availability of such patients during the COVID-19 pandemic;
- the availability of new drugs approved for the indication the clinical trial is investigating; and
- clinicians' and patients' perceptions as to the potential advantages of the drug being studied in relation to other available therapies.

These factors may make it difficult for us to enroll enough patients to complete our clinical trials in a timely and cost-effective manner. Delays in the completion of any clinical trial of our product candidates will increase our costs, slow down our product candidate development and approval process, and delay or potentially jeopardize our ability to commence product sales and generate revenue. In addition, some of the factors that cause, or lead to, a delay in the commencement or completion of clinical trials may also ultimately lead to the denial of regulatory approval of our product candidates.

We face substantial competition, which may result in others discovering, developing or commercializing products before or more successfully than we do.

We face competition from numerous pharmaceutical and biotechnology enterprises, as well as from academic institutions, government agencies and private and public research institutions. Our ability to enroll clinical trials or our commercial opportunities will be reduced or eliminated if our competitors develop and commercialize products that are safer, more effective, have fewer side effects or are less expensive than any products that we may develop. Additionally, our commercial opportunities will be reduced or eliminated if novel upstream products or changes in treatment protocols reduce the overall incidence or prevalence of our current or future target diseases. Competition could result in reduced sales and pricing pressure on our product candidates, if approved by applicable regulatory authorities. In addition, significant delays in the development of our product candidates could allow our competitors to bring products to market before us and impair any ability to commercialize our product candidates.

Risks Related to Regulation and Legal Compliance

We are just beginning the clinical development of our product candidates and our future success is dependent on the successful development and regulatory approval of our product candidates.

We currently have no products approved for commercial sale, and we are just beginning the clinical development of our product candidates. With the opening of a clinical trial site in March 2022, we have initiated our Phase 1 clinical trial of LYL797. Besides LYL797, all of our other proprietary product candidates are currently in preclinical development. The future success of our business is substantially dependent on our ability to obtain regulatory approval for our product candidates for the indications we seek, and, if approved, to successfully commercialize one or more product candidates in a timely manner. Each of our programs and product candidates will require clinical development, regulatory approval, obtaining manufacturing supply, capacity and expertise, building a commercial organization or successfully outsourcing commercialization, substantial investment and significant marketing efforts before we generate any revenue from product sales. We do not have any products that are approved for commercial sale, and we may never be able to develop or commercialize marketable products.

We cannot commercialize product candidates in the United States without first obtaining regulatory approval for the product from the FDA; similarly, we cannot commercialize product candidates outside of the United States without obtaining regulatory approval from comparable foreign regulatory authorities. Before obtaining regulatory approvals for the commercial sale of any product candidate for a target indication, we must demonstrate with substantial evidence from and to the satisfaction of the FDA and foreign regulatory authorities, that the product candidate is safe, pure and potent for use for that target indication and that the manufacturing facilities, processes and controls are adequate with respect to such product candidate to assure safety, purity and potency.

The time required to obtain approval by the FDA and comparable foreign regulatory authorities is unpredictable but typically takes many years following the commencement of preclinical studies and clinical trials and depends upon numerous factors, including the substantial discretion of the regulatory authorities. In addition, approval policies, regulations, or the type and amount of clinical data necessary to gain approval may change during the course of a product candidate's clinical development and may vary among jurisdictions. We have not obtained regulatory approval for any product candidate and it is possible that none of our existing product candidates or any future product candidates will ever obtain regulatory approval. Furthermore, the regulatory approval process for novel product candidates, such as T-cell product candidates and next-generation T-cell programs, can be more complex and consequently more expensive and take longer than for other, better known or extensively studied pharmaceutical or other product candidates.

Even if a product candidate were to successfully obtain approval from the FDA and comparable foreign regulatory authorities, any approval might contain significant limitations related to use restrictions for specified age groups, warnings, precautions or contraindications, or may be subject to burdensome post-approval study or risk management requirements. If we are unable to obtain regulatory approval for one of our product candidates in one or more jurisdictions, or any approval contains significant limitations, we may not be able to obtain sufficient funding to continue the development of

that product or generate revenues attributable to that product candidate. Also, any regulatory approval of our current or future product candidates, once obtained, may be withdrawn.

Our cellular therapy product candidates represent new therapeutic approaches that could result in heightened regulatory scrutiny, delays in clinical development or delays in or our inability to achieve regulatory approval, commercialization or payor coverage of our product candidates.

Our future success is dependent on the successful development of our cellular therapies in general and our development product candidates in particular. Because these programs represent a new approach to the treatment of cancer, developing and, if approved, commercializing our product candidates subject us to a number of challenges. Moreover, we cannot be sure that the manufacturing processes used in connection with our cellular therapy product candidates will yield a sufficient supply of satisfactory products that are safe, pure and potent, scalable or profitable.

In addition to FDA oversight and oversight by institutional review boards (IRBs) under guidelines promulgated by the National Institutes of Health (NIH), gene therapy clinical trials are also subject to review and oversight by an institutional biosafety committee (IBC), a local institutional committee that reviews and oversees research utilizing recombinant or synthetic nucleic acid molecules at that institution. The IBC assesses the safety of the research and identifies any potential risk to public health or the environment. While the NIH guidelines are not mandatory unless the research in question is being conducted at or sponsored by institutions receiving NIH funding of recombinant or synthetic nucleic acid molecule research, many companies and other institutions not otherwise subject to the NIH Guidelines voluntarily follow them. Although the FDA decides whether trials of cell therapies that involve genetic engineering may proceed, the review process and determinations of other reviewing bodies can impede or delay the initiation of a clinical trial, even if the FDA has reviewed the trial and approved its initiation.

Actual or perceived safety issues, including adoption of new therapeutics or novel approaches to treatment, may adversely influence the willingness of subjects to participate in clinical trials, or if approved by applicable regulatory authorities, of physicians to subscribe to the novel treatment mechanics. The FDA or other applicable regulatory authorities may ask for specific post-market requirements, and additional information informing benefits or risks of our products may emerge at any time prior to or after regulatory approval.

Physicians, hospitals and third-party payors often are slow to adopt new products, technologies and treatment practices that require additional upfront costs and training. Physicians may not be willing to undergo training to adopt this novel therapy, may decide the therapy is too complex to adopt without appropriate training or not cost-efficient, and may choose not to administer the therapy. Based on these and other factors, hospitals and payors may decide that the benefits of this new therapy do not or will not outweigh its costs.

The results of research, preclinical studies or earlier clinical trials are not necessarily predictive of future results. Any product candidate we advance into clinical trials may not have favorable results in later clinical trials or receive regulatory approval.

Success in research, preclinical studies and early clinical trials does not ensure that later clinical trials will generate similar results and otherwise provide adequate data to demonstrate the efficacy and safety of an investigational product. Likewise, a number of companies in the pharmaceutical and biotechnology industries, including those with greater resources and experience than us, have suffered significant setbacks in late-stage clinical trials, even after seeing promising results in earlier preclinical studies or clinical trials. Thus, even if the results from our initial research and preclinical activities appear positive, we do not know whether subsequent late-stage clinical trials we may conduct will demonstrate adequate efficacy and safety to result in regulatory approval to market any product candidates.

Moreover, final study results may not be consistent with interim study results. If later-stage clinical trials do not produce favorable results, our ability to achieve regulatory approval for any of our product candidates may be adversely impacted. Even if we believe that we have adequate data to support an application for regulatory approval to market any of our product candidates, the FDA or other regulatory authorities may not agree and may require that we conduct additional clinical trials.

Clinical development involves a lengthy and expensive process with an uncertain outcome.

We are just beginning clinical development of our product candidates. With the opening of a clinical trial site in March 2022, we have initiated our Phase 1 clinical trial of LYL797. Besides LYL797, all of our other proprietary product candidates are currently in preclinical development. The risk of failure of our product candidates is high. The clinical trials and manufacturing of our product candidates are, and the manufacturing and marketing of our products, if approved, will

be, subject to extensive and rigorous review and regulation by numerous government authorities in the United States and in other countries where we intend to test and market our product candidates. Before obtaining regulatory approvals for the commercial sale of any of our product candidates, we must demonstrate through lengthy, complex and expensive preclinical testing and clinical trials that our product candidates are both safe and effective for use in each target indication. In particular, because our product candidates are subject to regulation as biological products, we will need to demonstrate that they are safe, pure and potent for use in their target indications. Each product candidate must demonstrate an adequate risk versus benefit profile in its intended patient population and for its intended use.

The clinical testing that will be required for any product candidates we choose to advance is expensive and can take many years to complete, and its outcome is inherently uncertain. We cannot guarantee that any clinical trials will be conducted as planned or completed on schedule, if at all. Failure can occur at any time during the clinical trial process. Even if our current and planned clinical trials are completed as planned, we cannot be certain that their results will support the safety and effectiveness of our product candidates for their targeted indications or support continued clinical development of such product candidates. Product candidates in later stages of clinical trials may fail to show the desired safety and efficacy traits despite having progressed through preclinical and clinical trials.

In addition, even if such 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 our product candidates for approval. Moreover, results acceptable to support approval in one jurisdiction may be deemed inadequate by another regulatory authority to support regulatory approval in that other jurisdiction. To the extent that the results of the trials are not satisfactory to the FDA or foreign regulatory authorities for support of a marketing application, we may be required to expend significant resources, which may not be available to us, to conduct additional trials in support of potential approval of our product candidates.

To date, we have not enrolled or completed any clinical trials required for the approval of our product candidates. We may experience delays in initiating, enrolling or conducting our current and planned clinical trials, and we do not know whether clinical trials will begin or enroll subjects on time, will need to be redesigned, will achieve expected enrollment rates or will be completed on schedule, if at all. For example, obtaining sufficient and specific tumor tissues will be needed for our planned Phase 1 clinical trial of LYL845 in multiple solid tumor indications. Our inability to obtain the specific tumor tissues or sufficient amount of tumor tissues in a timely manner or at all could delay or preclude our ability to initiate the planned clinical trial. There can be no assurance that the FDA or comparable foreign regulatory authorities will not put clinical trials of any of our product candidates on clinical hold in the future. Clinical trials can be delayed, suspended or terminated for a variety of reasons, including in connection with:

- 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 agreement with the FDA or other regulatory authorities as to the design or implementation of our clinical trials;
- obtaining regulatory authorization to commence a clinical trial;
- reaching an agreement on acceptable terms with clinical trial sites or prospective CROs, the terms of which can be subject to extensive negotiation and may vary significantly among different clinical trial sites;
- obtaining IRB or ethics committee approval at each trial site;
- recruiting suitable patients to participate in a clinical trial;
- having patients complete a clinical trial or return for post-treatment follow-up;
- inspections of clinical trial sites or operations by applicable regulatory authorities, or the imposition of a clinical hold;
- clinical sites, CROs or other third parties deviating from trial protocol or dropping out of a trial;
- failure to perform in accordance with applicable regulatory requirements, including the FDA's GCP requirements, or applicable regulatory requirements in other countries;
- addressing patient safety concerns that arise during the course of a trial, including occurrence of adverse events associated with the product candidate that are viewed to outweigh its potential benefits;

- adding a sufficient number of clinical trial sites;
- manufacturing sufficient quantities of product candidate for use in clinical trials; or
- suspensions or terminations by IRBs of the institutions at which such trials are being conducted, by the Data Safety Monitoring Board for such trial or by the FDA or other regulatory authorities due to a number of factors, including those described above.

Further, a clinical trial may be suspended or terminated by us, the institutional review boards for the institutions in which such trials are being conducted, the Data Monitoring Committee for such trial, or 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 product candidate, changes in governmental regulations or administrative actions or lack of adequate funding to continue the clinical trial.

We cannot predict with any certainty whether or when we might complete a given clinical trial, if at all. If we experience delays or quality issues in the conduct, completion or termination of any clinical trial of our product candidates, the approval and commercial prospects of such product candidate will be harmed, and our ability to generate product revenues from such product candidate will be delayed. In addition, any delays in completing our clinical trials will increase our costs, slow down our product candidate development and approval process and jeopardize our ability to commence product sales and generate revenues. 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 product candidates.

Our product candidates may cause undesirable side effects or have other properties that could delay or prevent their regulatory approval, limit the commercial profile of an approved label or result in significant negative consequences following any regulatory approval. Additionally, our product candidates, if approved, could be subject to labeling and other restrictions and market withdrawal and we may be subject to penalties if we fail to comply with regulatory requirements or experience unanticipated problems with our products.

Undesirable side effects caused by our product 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 authority. As a result of safety or toxicity issues that we may experience in our clinical trials, we may not continue the development of nor receive approval to market any product candidates, which could prevent us from ever generating product revenues or achieving profitability. For example, previous clinical trials utilizing a CAR T cell to treat hematologic tumors have shown an increased risk of cytokine release syndrome and immune effector cell-associated neurotoxicity syndrome. Adverse events may also be associated with the lymphodepletion regimen utilized with cellular therapies. Additionally, ROR1 is expressed on a number of normal tissues. As a result, ROR1 could cause on-target, off-tumor toxicity. c-JUN is also potentially an oncogene and could cause healthy cells to transform into malignant cells. Results of our trials could reveal an unacceptably high severity and incidence of side effects, or side effects outweighing the benefits of our product candidates. In such an event, our trials could be suspended or terminated and the FDA or comparable foreign regulatory authorities could order us to cease further development or deny approval of our product candidates for any or all targeted indications. The side effects experienced could affect patient recruitment or the ability of enrolled subjects to complete the trial or result in potential product liability claims.

In the event that any of our product candidates receives regulatory approval and we or others later identify undesirable or unacceptable side effects caused by such products, a number of potentially significant negative consequences could result, including:

- regulatory authorities may withdraw or limit approvals of such products and require us to take our approved product off the market;
- regulatory authorities may require the addition of labeling statements, specific warnings, a contraindication or field alerts to physicians and pharmacies, or issue other communications containing warnings or other safety information about the product;
- regulatory authorities may require a medication guide outlining the risks of such side effects for distribution to patients, or that we implement a risk evaluation and mitigation strategy (REMS) plan to ensure that the benefits of the product outweigh its risks;
- we may be required to change the dose or the way the product is administered, conduct additional clinical trials, or change the labeling of the product;

- we may be subject to limitations on how we may promote or manufacture the product;
- sales of the product may decrease significantly;
- we may be subject to litigation or product liability claims; and
- our reputation may suffer.

Any of these events could prevent us or our potential future partners from achieving or maintaining market acceptance of the affected product or could substantially increase commercialization costs and expenses, which in turn could delay or prevent us from generating significant revenue from the sale of any products.

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

From time to time, we may publicly disclose interim, topline, or preliminary data from our preclinical studies and clinical trials, which is based on a preliminary analysis of then-available data, and the results and related findings and conclusions are subject to change following a more comprehensive review of the data related to the particular study or trial. 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. Further, modifications or improvements to our manufacturing processes for a therapy may result in changes to the characteristics or behavior of the product candidate that could cause our product candidates to perform differently and affect the results of our ongoing clinical trials. 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. 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 previously published. As a result, topline data should be viewed with caution until the final data are available.

From time to time, we may also disclose preliminary or interim data from our preclinical studies and clinical trials. Preliminary or interim data from clinical trials are subject to the risk that one or more of the clinical outcomes may materially change as patient enrollment continues and more patient data become available. Adverse differences between preliminary or interim data and final data could significantly harm our business prospects. Additionally, disclosure of preliminary or interim data by us or by our competitors could result in volatility in the price of our common stock.

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 product candidate and our company in general. If the interim, topline, or preliminary data that we report differ from actual results, or if others, including regulatory authorities, disagree with the conclusions reached, our ability to obtain approval for, and commercialize, any of our potential product candidates may be harmed, which could harm our business, operating results, prospects, or financial condition.

The FDA regulatory approval process is lengthy, time-consuming and inherently unpredictable. If we are not able to obtain required regulatory approval of our product candidates, our business will be substantially harmed.

We expect the novel nature of our product candidates to create challenges in obtaining regulatory approval. For example, the FDA has limited experience with commercial development of T-cell therapies for cancer. Accordingly, the regulatory approval pathway for our product candidates may be uncertain, complex, expensive and lengthy, and approval may not be obtained.

Prior to obtaining approval to commercialize any drug product candidate in the United States or abroad, we must demonstrate with substantial evidence from well-controlled clinical trials, and to the satisfaction of the FDA or foreign regulatory agencies, that such product candidates are safe, pure and potent for their intended uses. Results from preclinical studies and clinical trials can be interpreted in different ways. Even if we believe the preclinical or clinical data for our product candidates are promising, such data may not be sufficient to support approval by the FDA and other regulatory authorities. The FDA may also require us to conduct additional preclinical studies or clinical trials for our product candidates either prior to or after approval, or it may object to elements of our clinical development programs.

Our product 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 a product candidate is safe and effective for its proposed indication;
- 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 a product candidate's clinical and other benefits outweigh its safety risks;
- the FDA or comparable foreign regulatory authorities may fail to approve the manufacturing processes or facilities of third-party manufacturers with which we contract for clinical and commercial supplies; and
- the approval policies or regulations of the FDA or comparable foreign authorities may significantly change in a manner rendering our clinical data insufficient for approval.

Of the large number of products in development, only a small percentage successfully complete the FDA or foreign regulatory approval processes and are commercialized. The lengthy approval and marketing authorization process as well as the unpredictability of clinical trial results may result in our failing to obtain regulatory approval and marketing authorization to market our product candidates, which would significantly harm our business, financial condition, results of operations and prospects.

We could also encounter delays if physicians encounter unresolved ethical issues associated with enrolling patients in clinical trials of our product candidates in lieu of prescribing existing treatments that have established safety and efficacy profiles. Further, a clinical trial may be suspended or terminated by us, the institutional review boards for the institutions in which such trials are being conducted, the Data Monitoring Committee for such trial, or 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 product candidate, changes in governmental regulations or administrative actions or lack of adequate funding to continue the clinical trial.

Moreover, principal investigators for our clinical trials may serve as scientific advisors or consultants to us from time to time and receive cash or equity compensation in connection with such services. If these relationships and any related compensation result in perceived or actual conflicts of interest, or a regulatory authority concludes that the financial relationship may have affected the interpretation of the trial, the integrity of the data generated at the applicable clinical trial site may be questioned and the utility of the clinical trial itself may be jeopardized, which could result in the delay or rejection of the marketing application we submit. Any such delay or rejection could prevent or delay us from commercializing our current or future product candidates.

If we experience termination of, or delays in the completion of, any clinical trial of our product candidates, the commercial prospects for our product 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 product candidates.

Even if our product candidates obtain regulatory approval, we will be subject to ongoing obligations and continued regulatory review, which may result in significant additional expense. Additionally, our product candidates, if approved, could be subject to labeling and other restrictions and market withdrawal and we may be subject to penalties if we fail to comply with regulatory requirements or experience unanticipated problems with our products.

If the FDA or a comparable foreign regulatory authority approves any of our product candidates, the manufacturing processes, testing, labeling, packaging, distribution, import, export, adverse event reporting, storage, advertising, promotion and recordkeeping for the product will be subject to extensive and ongoing regulatory requirements. These requirements include submissions of safety and other post-marketing information and reports, registration, as well as continued compliance with cGMPs for any clinical trials that we conduct post-approval, all of which may result in significant expense and limit our ability to commercialize such products. In addition, any regulatory approvals that we

receive for our product candidates may also be subject to limitations on the approved indicated uses for which the product may be marketed or to the conditions of approval, or contain requirements for potentially costly post-marketing testing, including Phase 4 clinical trials, and surveillance to monitor the safety and efficacy of the product candidate.

Manufacturers and manufacturers' facilities are required to comply with extensive FDA and comparable foreign regulatory authority requirements, including ensuring that quality control and manufacturing procedures conform to cGMP regulations, as well as, for the manufacture of certain of our product candidates, the FDA's cGTPs for the use of human cellular and tissue products to prevent the introduction, transmission or spread of communicable diseases. As such, we and our contract manufacturers will be subject to continual review and inspections to assess compliance with cGMPs, cGTPs and adherence to commitments made in any approved marketing application. Accordingly, we and others with whom we work must continue to expend time, money and effort in all areas of regulatory compliance, including manufacturing, quality control and distribution.

If there are changes in the application of legislation or regulatory policies, or if problems are discovered with a product or our manufacture of a product, or if we or one of our distributors, licensees or co-marketers fails to comply with regulatory requirements, the regulators could take various actions. These include issuing warning letters or untitled letters, imposing fines on us, imposing restrictions on the product or its manufacture, and requiring us to recall or remove the product from the market. The regulators could also suspend or withdraw our marketing authorizations, requiring us to conduct additional clinical trials, change our product labeling, or submit additional applications for marketing authorization. If any of these events occurs, our ability to sell such product may be impaired, and we may incur substantial additional expense to comply with regulatory requirements, which could materially adversely affect our business, financial condition and results of operations.

In addition, if we have any product candidate approved, our product labeling, advertising and promotion will be subject to regulatory requirements and continuing regulatory review. In the United States, the FDA and the Federal Trade Commission (FTC) strictly regulate the promotional claims that may be made about pharmaceutical products to ensure that any claims about such products are consistent with regulatory approvals, not misleading or false in any particular, and adequately substantiated by clinical data. The promotion of a drug product in a manner that is false, misleading, unsubstantiated, or for unapproved (or off-label) uses may result in enforcement letters, inquiries and investigations and civil and criminal sanctions by the FDA, FTC and other regulatory authorities. In particular, a product may not be promoted for uses that are not approved by the FDA as reflected in the product's approved labeling. If we receive marketing approval for a product candidate, physicians may nevertheless prescribe it to their patients in a manner that is inconsistent with the approved label. If we are found to have promoted such off-label uses, we may become subject to significant liability. The FDA and other agencies actively enforce the laws and regulations prohibiting the promotion of off-label uses, and a company that is found to have improperly promoted off-label uses may be subject to significant sanctions and may result in false claims litigation under federal and state statutes, which can lead to consent decrees, civil monetary penalties, restitution, criminal fines and imprisonment, and exclusion from participation in Medicare, Medicaid and other federal and state healthcare programs. The federal government has levied large civil and criminal fines against companies for alleged improper promotion and has enjoined several companies from engaging in off-label promotion. The government has also required that companies enter into consent decrees and/or imposed permanent injunctions under which specified promotional conduct is changed or curtailed.

If a regulatory agency discovers previously unknown problems with a product, such as adverse events of unanticipated severity or frequency, or problems with the facility where the product is manufactured, or disagrees with the promotion, marketing or labeling of a product, such regulatory agency may impose restrictions on that product or us, including requiring withdrawal of the product from the market. If we fail to comply with applicable regulatory requirements, a regulatory agency or enforcement authority may, among other things:

- issue warning letters;
- issue, or require us to issue, safety-related communications, such as safety alerts, field alerts, "Dear Doctor" letters to healthcare professionals, or import alerts;
- impose civil or criminal penalties;
- suspend, limit, or withdraw regulatory approval;
- suspend any of our preclinical studies and clinical trials;
- refuse to approve pending applications or supplements to approved applications submitted by us;
- impose restrictions on our operations, including closing our and our contract manufacturers' facilities; or

- seize or detain products, refuse to permit the import or export of products, or require us to conduct a product recall.

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 approved. If regulatory sanctions are applied or if regulatory approval is withdrawn, the value of our company and our operating results will be adversely affected.

Moreover, the policies of the FDA and of comparable foreign regulatory authorities may change and additional government regulations may be enacted that could prevent, limit, or delay regulatory approval of our product 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. In addition, 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.

We may be subject to applicable fraud and abuse, including anti-kickback and false claims, transparency, health information privacy and security and other healthcare laws. Failure to comply with such laws, may result in substantial penalties.

We may be subject to broadly applicable healthcare laws and regulations that may constrain the business or financial arrangements and relationships through which we conduct research, market, sell and distribute any product candidates for which we obtain marketing approval. The healthcare laws that may affect us include: the federal fraud and abuse laws, including the federal anti-kickback, and false claims and civil monetary penalties laws; federal data privacy and security laws, including the Health Insurance Portability and Accountability Act, as amended by the Health Information Technology for Economic and Clinical Health Act; and federal transparency laws related to ownership and investment interests and payments and/or other transfers of value made to or held by physicians (including 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 physicians and their immediate family members. In addition, many states have similar laws and regulations that may differ from each other and federal law in significant ways, thus complicating compliance efforts. Moreover, several states require biopharmaceutical companies to comply with the biopharmaceutical industry's voluntary compliance guidelines and the relevant compliance guidance promulgated by the federal government and may require drug manufacturers to report information related to payments and other transfers of value to physicians and other healthcare providers or marketing expenditures. Additionally, some state and local laws require the registration of biopharmaceutical sales representatives in the jurisdiction.

Ensuring that our operations and future business arrangements with third parties comply with applicable healthcare laws and regulations will involve substantial costs. 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, agency guidance 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 the laws described above or any other governmental laws and regulations that may apply to us, we may be subject to significant civil, criminal and administrative penalties, damages, disgorgement, fines, imprisonment, exclusion of products from government funded healthcare programs, such as Medicare and Medicaid, additional reporting requirements and/or oversight if a corporate integrity agreement or similar agreement is executed to resolve allegations of non-compliance with these laws and the curtailment or restructuring of operations. In addition, violations may also result in reputational harm, diminished profits and future earnings. For additional detail on healthcare laws that may affect our business, see Other Healthcare Laws in the business section.

Changes in healthcare policies, laws and regulations may impact our ability to obtain approval for, or commercialize our product candidates, if approved.

In the United States and some foreign jurisdictions there have been, and continue to be, several legislative and regulatory changes and proposed reforms of the healthcare system in an effort to contain costs, improve quality and expand access to care. In the United States, there have been and continue to be a number of healthcare-related legislative initiatives, as well as executive, judicial and Congressional challenges to existing healthcare laws that have significantly affected, and could continue to significantly affect, the healthcare industry. For example, there have been efforts to repeal, substantially modify or invalidate some or all of the provisions of the ACA, some of which have been successful. However, on June 17, 2021, the U.S. Supreme Court dismissed a challenge on procedural grounds that argued the ACA is unconstitutional in its entirety because the "individual mandate" was repealed by Congress. Thus, the ACA will remain in effect in its current form. In addition, there continues to be heightened governmental scrutiny over the manner in which manufacturers set prices for their marketed products, which has resulted in several U.S. Congressional inquiries and proposed and enacted federal and state legislation designed to, among other things, bring more transparency to drug pricing, reduce the cost of prescription drugs under government payor programs and review the relationship between pricing and manufacturer patient programs. For example, President Biden issued an executive order in July 2021 supporting legislation to enact drug pricing reforms and, in response, the U.S. Department of Health and Human Services released a Comprehensive Plan for Addressing High Drug Prices in September 2021 with specific legislative and administrative policies that Congress could enact to help improve affordability of and access to prescription drugs. No legislation or administrative actions have been finalized to implement these principles. It is unclear whether these or similar policy initiatives will be implemented in the future. 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 product candidates or additional pricing pressures. For additional detail on health reform measures that may affect our business, see Healthcare Reform in the business section.

The successful commercialization of our product candidates will depend in part on the extent to which governmental authorities and health insurers establish adequate coverage, reimbursement levels and pricing policies. Failure to obtain or maintain coverage and adequate reimbursement for our product candidates, if approved, could limit our ability to market those products and decrease our ability to generate revenue.

The availability and adequacy of coverage and reimbursement by governmental healthcare programs such as Medicare and Medicaid, private health insurers and other third-party payors are essential for most patients to be able to afford prescription medications such as our product candidates, assuming FDA approval. Our ability to achieve acceptable levels of coverage and reimbursement for products by governmental authorities, private health insurers and other organizations will have an effect on our ability to successfully commercialize our product candidates. Third-party payors often rely upon Medicare coverage policy and payment limitations in setting their own coverage and reimbursement policies. However, decisions regarding the extent of coverage and amount of reimbursement to be provided are made on a payor-by-payor basis. Reimbursement by a third-party payor may depend upon a number of factors, including the third-party payor's determination that a procedure is safe, effective and medically necessary; appropriate for the specific patient; cost effective; supported by peer-reviewed medical journals; included in clinical practice guidelines; and neither cosmetic, experimental, nor investigational. Assuming we obtain coverage for our product candidates by a third-party payor, the resulting reimbursement payment rates may not be adequate or may require co-payments that patients find unacceptably high. We cannot be sure that coverage and reimbursement in the United States, the European Union or elsewhere will be available for our product candidates or any product that we may develop, and any reimbursement that may become available may be decreased or eliminated in the future. Additionally, we or our collaborators may develop companion diagnostic tests for use with our product candidates. We, or our collaborators, will be required to obtain coverage and reimbursement for these tests separate and apart from the coverage and reimbursement we may seek for our product candidates.

Similarly, a significant trend in the healthcare industry is cost containment. Third-party payors have attempted to control costs by limiting coverage and the amount of reimbursement for particular medications. As such, cost containment reform efforts may result in an adverse effect on our operations. Obtaining coverage and adequate reimbursement for our product candidates may be particularly difficult because of the higher prices often associated with drugs administered under the supervision of a physician. Similarly, because our product candidates will be physician-administered, separate reimbursement for the product itself may or may not be available. Instead, the administering physician may or may not be reimbursed for providing the treatment or procedure in which our product is used.

Disruptions at the FDA and other government agencies caused by funding shortages or global health concerns could hinder their ability to hire, retain or deploy key leadership and other personnel, or otherwise prevent new or modified products from being developed, approved or commercialized in a timely manner or at all, 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, statutory, regulatory, and policy changes, the FDA's ability to hire and retain key personnel and accept the payment of user fees, and other events that may otherwise affect the FDA's ability to perform routine functions. Average review times at the agency 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 biologics or modifications to be cleared or approved biologics to be reviewed and/or approved by necessary government agencies, which would adversely affect our business. For example, over the last several years the U.S. government has shut down several times and certain regulatory agencies, such as the FDA, have had to furlough FDA employees and stop critical activities.

Separately, in response to the COVID-19 pandemic, in March 2020, the FDA announced its intention to postpone most inspections of foreign manufacturing facilities, and the FDA temporarily postponed routine surveillance inspections of domestic manufacturing facilities. In February 2022, the FDA resumed on-site inspections of domestic manufacturing facilities subject to a risk-based prioritization system. The FDA intends to use this risk-based assessment system to identify the categories of regulatory activity that can occur within a given geographic area, ranging from mission critical inspections to resumption of all regulatory activities. Additionally, on April 15, 2021, the FDA issued a guidance document in which the FDA described its plans to conduct voluntary remote interactive evaluations of certain drug manufacturing facilities and clinical research sites. According to the guidance, the FDA intends to request such remote interactive evaluations in situations where an in-person inspection would not be prioritized, deemed mission-critical, or where direct inspection is otherwise limited by travel restrictions, but where the FDA determines that remote evaluation would still be appropriate. Regulatory authorities outside the United States may adopt similar restrictions or other policy measures in response to the COVID-19 pandemic. If a prolonged government shutdown occurs, or if global health concerns continue to 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.

Risks Relating to Our Intellectual Property

If we are unable to obtain and maintain sufficient intellectual property protection for our product candidates, or if the scope of the intellectual property protection is not sufficiently broad, our ability to commercialize our product candidates successfully and to compete effectively may be adversely affected.

We rely upon a combination of patents, trademarks, trade secrets and confidentiality agreements to protect the intellectual property related to our technology and product candidates. We own or possess certain intellectual property, and other intellectual property are owned or possessed by our partners and are in-licensed to us. When we refer to "our" technologies, inventions, patents, patent applications or other intellectual property rights, we are referring to both the rights that we own or possess as well as those that we in-license, many of which are critical to our intellectual property protection and our business. If the intellectual property that we rely on is not adequately protected, competitors may be able to use our technologies and erode or negate any competitive advantage we may have.

The patentability of inventions and the validity, enforceability and scope of patents in the biotechnology field is uncertain because it involves complex legal, scientific and factual considerations, and it has in recent years been the subject of significant litigation. Moreover, the standards applied by the U.S. Patent and Trademark Office (USPTO) and non-U.S. patent offices in granting patents are not always applied uniformly or predictably. There is also no assurance that all potentially relevant prior art relating to our patents and patent applications is known to us or has been found in the instances where searching was done. We may be unaware of prior art that could be used to invalidate an issued patent or prevent a pending patent application from issuing as a patent. There also may be prior art of which we are aware, but which we do not believe affects the validity, enforceability or patentability of a claim of one of our patents or patent applications, which may, nonetheless, ultimately be found to affect the validity, enforceability or patentability of such claim. As a consequence of these and other factors, our patent applications may fail to result in issued patents with claims that cover our product candidates in the United States or in other countries.

Even if patents have issued or do successfully issue from patent applications, and even if these patents cover our product candidates, third parties may challenge the validity, enforceability or scope thereof, which may result in these patents being narrowed, invalidated or held to be unenforceable. No assurance can be given that if challenged, our patents would be declared by a court to be valid or enforceable. Even if unchallenged, our patents and patent applications or other intellectual property rights may not adequately protect our intellectual property, provide exclusivity for our product candidates or prevent others from designing around our claims. The possibility exists that others will develop products on an independent basis which have the same effect as our product candidates and which do not infringe our patents or other intellectual property rights, or that others will design around the claims of patents that we have had issued that cover our product candidates. If the breadth or strength of protection provided by our patents and patent applications with respect to our product candidates is threatened, it could jeopardize our ability to commercialize our product candidates and dissuade companies from collaborating with us.

We may also desire to seek licenses from third parties who own or have rights to intellectual property that may be useful for providing exclusivity for our product candidates, or for providing the ability to develop and commercialize a product candidate in an unrestricted manner. There is no guarantee that we will be able to obtain such licenses from third parties on commercially reasonable terms, or at all.

In addition, the USPTO and various foreign governmental or inter-governmental patent agencies require compliance with a number of procedural, documentary, fee payment and other similar provisions during and after 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, irreversible loss of patent rights in the relevant jurisdiction. In such an event, our competitors might be able to enter the market, which could have a material adverse effect on our business.

United States patent applications containing or that at any time contained a claim not entitled to a priority date before March 16, 2013 are subject to the "first to file" system implemented by the America Invents Act (2011). The first to file system requires us to be cognizant going forward of the time from invention to filing of a patent application. Because patent applications in the U.S. and most other countries are confidential for a period of time after filing, and some remain so until issued, we cannot be certain that we or our partners were the first to file any patent application related to a product candidate.

In addition, our registered or unregistered trademarks or trade names may be challenged, infringed or declared generic or determined to be infringing on other marks. We may not be able to protect our rights to these trademarks and trade names, which we view as valuable to building name recognition among potential partners and customers in our markets of interest. At times, competitors or other third parties have adopted or may adopt trade names or trademarks similar to ours, thereby impeding our ability to build brand identity and possibly leading to market confusion and/or litigation. In addition, there could be potential trade name or trademark infringement claims brought by owners of other registered trademarks or trademarks that incorporate variations of our registered or unregistered trademarks or trade names. Over the long term, if we are unable to establish name recognition based on our trademarks and trade names, then we may not be able to compete effectively and our business may be adversely affected. Our efforts to enforce, protect, or defend our proprietary rights related to trademarks may be ineffective and could result in substantial costs and diversion of resources and could adversely affect our business, financial condition, results of operations and prospects.

The lives of our patents may not be sufficient to effectively protect our products and business.

Patents have a limited lifespan. In the United States, the natural expiration of a patent is generally 20 years after its first nonprovisional effective filing date. Although various extensions may be available, the life of a patent, and the protection it affords, is limited. Even if patents covering our product candidates are obtained, once the patent life has expired for a product, we may be open to competition from biosimilar or generic medications. In addition, although upon issuance in the United States a patent's life can be increased based on certain delays caused by the USPTO, this increase can be reduced or eliminated based on certain delays caused by the patent applicant during patent prosecution. The patent term of certain patents can also be extended with respect to a specific product to recapture time lost in clinical trials and regulatory review by the FDA. A patent's life also can be shortened by a terminal disclaimer over an earlier filed patent or patent application. If we do not have sufficient patent life to protect our products, our business and results of operations will be adversely affected.

We may not be able to protect our intellectual property rights throughout the world.

Filing, prosecuting, enforcing and defending patents on all of our product candidates in all countries throughout the world would be prohibitively expensive. Our intellectual property rights in certain countries outside the United States may be less extensive than those in the United States. In addition, the laws of certain foreign countries do not protect intellectual property rights to the same extent as laws in the United States. Consequently, we and our partners may not be able to prevent third parties from practicing our inventions in countries outside the United States, or from selling or importing infringing products made using our inventions in other jurisdictions. Competitors may use our technologies in jurisdictions where we have not obtained patent protection or where we do not have exclusive rights under the relevant patents to develop their own products and, further, may export otherwise-infringing products to territories where we and our partners have patent protection but where enforcement is not as strong as that in the U.S. These infringing products may compete with our product candidates in jurisdictions where we or our partners have no issued patents or where we do not have exclusive rights under the relevant patents, or our patent claims and other intellectual property rights may not be effective or sufficient to prevent them from so competing.

Many companies have encountered significant problems in protecting and defending intellectual property rights in foreign jurisdictions. The legal systems of certain countries, particularly certain developing countries, do not favor the enforcement of patents and other intellectual property protection, particularly those relating to biopharmaceuticals, which could make it difficult for us and our partners to stop the infringement of our patents or marketing of competing products in violation of our intellectual property rights generally. Proceedings to enforce our patent rights in foreign jurisdictions could result in substantial costs and divert our attention from other aspects of our business, could put our patents at risk of being invalidated or interpreted narrowly, could put our patent applications at risk of not issuing, and could provoke third parties to assert claims against us or our partners. We or our partners may not prevail in any lawsuits that we or our licensors initiate, and even if we or our licensors are successful the damages or other remedies awarded, if any, may not be commercially meaningful.

Many countries have compulsory licensing laws under which a patent owner may be compelled to grant licenses to third parties. In addition, many countries limit the enforceability of patents against government agencies or government contractors. In these countries, we or our partners may have limited remedies, which could materially diminish the value of such patent. If we or our partners are forced to grant a license to third parties with respect to any patents relevant to our business, our competitive position may be impaired, and our business, financial condition, results of operations and prospects may be adversely affected.

If we are sued for infringing or misappropriating the intellectual property rights of third parties, the resulting litigation could be costly and time-consuming and could prevent or delay our development and commercialization efforts.

Our commercial success depends, in part, on us and our partners not infringing the patents and proprietary rights of third parties. There is a substantial amount of litigation and other adversarial proceedings, both within and outside the United States, involving patent and other intellectual property rights in the biotechnology and pharmaceutical industries, including patent infringement lawsuits, interference or derivation proceedings, oppositions, and inter partes and post-grant review proceedings before the USPTO and non-U.S. patent offices. Numerous U.S. and non-U.S. issued patents and pending patent applications owned by third parties exist in the fields in which we are developing, and may develop, product candidates. As the biotechnology and pharmaceutical industries expand and more patents are issued, the risk increases that our product candidates may be subject to claims of infringement of third parties' patent rights, as it may not always be clear to industry participants, including us, which patents cover various types of products, methods of making, or methods of use. The coverage of patents is subject to interpretation by the courts, and the interpretation is not always uniform or predictable.

Third parties may assert infringement or misappropriation claims against us based on existing or future intellectual property rights, alleging that we are employing their proprietary technology without authorization. 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 manufacturing of our product candidates that we failed to identify. For example, patent applications covering our product candidates could have been filed by others without our knowledge, since these applications generally remain confidential for some period of time after their filing date. Even pending patent applications that have been published, including some of which we are aware, could be later amended in a manner that could cover our product candidates or their use or manufacture. In addition, we may have analyzed patents or patent applications of third parties that we believe are relevant to our activities and believe that we are free to operate in relation to any of our product candidates, but our competitors may obtain issued claims, including in patents we consider to be unrelated, which may block our efforts or potentially result in any of our product candidates or our activities infringing their claims.

If we or our partners are sued for patent infringement, we would need to demonstrate that our product candidates, products and methods either do not infringe the patent claims of the relevant patent or that the patent claims are invalid or unenforceable, and we may not be able to do this. Proving that a patent is invalid is difficult and even if we are successful in the relevant proceedings, we may incur substantial costs and the time and attention of our management and scientific personnel could be diverted from other activities. If one or more claims of any issued third-party patents were held by a court of competent jurisdiction to cover aspects of our materials, formulations, methods of manufacture or methods for treatment, we could be forced, including by court order, to cease developing, manufacturing or commercializing the relevant product candidate until the relevant patent expired. Alternatively, we may desire or be required to obtain a license from such third party in order to use the infringing technology and to continue developing, manufacturing or marketing the infringing product candidate. However, we may not be able to obtain any required license on commercially reasonably terms, or at all. Even if we were able to obtain a license, the rights may be nonexclusive, which could result in our competitors gaining access to the same intellectual property licensed to us. If we are unable to obtain a necessary license on commercially reasonable terms, or at all, our ability to commercialize our product candidates may be impaired or delayed, which could in turn significantly harm our business.

We may face claims that we misappropriated the confidential information or trade secrets of a third party. If we are found to have misappropriated a third-party's trade secrets, we may be prevented from further using these trade secrets, which could limit our ability to develop our product candidates.

Defending against intellectual property claims, regardless of their merit, could be costly and time consuming, regardless of the outcome. Thus, even if we were to ultimately prevail, or to settle before a final judgment, any litigation could burden us with substantial unanticipated costs. In addition, litigation or threatened litigation could result in significant demands on the time and attention of our management team, distracting them from the pursuit of other company business. During the course of any intellectual property litigation, there could be public announcements of the results of hearings, rulings on motions and other interim proceedings in the litigation and these announcements may have negative impact on the perceived value of our product candidates, programs or intellectual property. In the event of a successful intellectual property claim against us, we may have to pay substantial damages, including treble damages and attorneys' fees if we are found to have willfully infringed a patent, or to redesign our infringing product candidates, which may be impossible or require substantial time and monetary expenditure. In addition to paying monetary damages, we may lose valuable intellectual property rights or personnel and the parties making claims against us may obtain injunctive or other equitable relief, which could impose limitations on the conduct of our business. We may also elect to enter into license agreements in order to settle patent infringement claims prior to litigation, and any of these license agreements may require us to pay royalties and other fees that could be significant. As a result of all of the foregoing, any actual or threatened intellectual property claim could prevent us from developing or commercializing a product candidate or force us to cease some aspect of our business operations.

We have in-licensed a significant portion of our intellectual property from our partners. If we breach any of our license agreements with these partners, we could potentially lose the ability to continue the development and potential commercialization of one or more of our product candidates.

We hold rights under license agreements with our partners. Our discovery and development technology platforms are built, in part, around intellectual property rights in-licensed from our partners. Under our existing license agreements, we are subject to various obligations, which may include diligence obligations with respect to development and commercialization activities, payment obligations upon achievement of certain milestones and royalties on product sales. If there is any conflict, dispute, disagreement or issue of nonperformance between us and our counterparties regarding our rights or obligations under these license agreements, including any conflict, dispute or disagreement arising from our failure to satisfy diligence or payment obligations, we may be liable to pay damages and our counterparties may have a right to terminate the affected license. The termination of any license agreement with one of our partners could adversely affect our ability to utilize the intellectual property that is subject to that license agreement in our discovery and development efforts, our ability to enter into future collaboration, licensing and/or marketing agreements for one or more affected product candidates and our ability to commercialize the affected product candidates. Furthermore, disagreements under any of these license agreements may arise, including those related to:

- the scope of rights granted under the license agreement and other interpretation-related issues;
- whether and the extent to which our technology and processes may infringe on intellectual property of the licensor that is not subject to the licensing agreement;
- our right to sublicense patent and other rights to third parties under collaborative development relationships; and

- the ownership of inventions and know-how resulting from the joint creation or use of intellectual property by our licensors and us and our partners.

These disagreements may harm our relationship with the partner, which could have negative impacts on other aspects of our business.

We may not be successful in obtaining or maintaining necessary rights to product components and processes for our development pipeline through acquisitions and in-licenses.

Presently we have rights to the intellectual property, through licenses from third parties and under patent applications that we own or will own, to develop our product candidates. Because our programs may involve additional product candidates that may require the use of proprietary rights held by third parties, the growth of our business will likely depend in part on our ability to acquire, in-license or use these proprietary rights.

Our product candidates may also require specific formulations, manufacturing methods, or technologies to work effectively and efficiently, and these rights may be held by others. We may be unable to acquire or in-license any compositions, methods of use, processes or other third party intellectual property rights from third parties that we identify. We may fail to obtain any of these licenses at a reasonable cost or on reasonable terms; such failure would harm our business. Even if we are able to obtain a license, it may be non-exclusive, thereby giving our competitors access to the same technologies licensed to us. In that event, we may be required to expend significant time and resources to develop or license replacement technology. We may need to cease use of the compositions or methods covered by such third-party intellectual property rights.

The licensing and acquisition of third-party intellectual property rights is a competitive area, and companies that may be more established or have greater resources than we do may also be pursuing strategies to license or acquire third-party intellectual property rights that we may consider necessary or attractive in order to commercialize our product candidates. More established companies may have a competitive advantage over us due to their size, cash resources and greater clinical development and commercialization capabilities.

Intellectual property discovered through government funded programs may be subject to federal regulations such as "march-in" rights, certain reporting requirements and a preference for U.S.-based companies. Compliance with such regulations may limit our exclusive rights and limit our ability to contract with non-U.S. manufacturers.

We have acquired or licensed, or may require in the future, intellectual property rights that have been generated through the use of U.S. government funding or grant. Pursuant to the Bayh-Dole Act of 1980, the U.S. government has certain rights in inventions developed with government funding. These U.S. government rights include a non-exclusive, non-transferable, irrevocable worldwide license to use inventions for any governmental purpose. In addition, the U.S. government has the right, under certain limited circumstances, to require us to grant exclusive, partially exclusive or non-exclusive licenses to any of these inventions to a third party if it determines that: (i) adequate steps have not been taken to commercialize the invention; (ii) government action is necessary to meet public health or safety needs; or (iii) government action is necessary to meet requirements for public use under federal regulations (also referred to as "march-in rights"). The U.S. government also has the right to take title to these inventions if the grant recipient fails to disclose the invention to the government or fails to file an application to register the intellectual property within specified time limits. Intellectual property generated under a government funded program is also subject to certain reporting requirements, compliance with which may require us to expend substantial resources. In addition, the U.S. government requires that any products embodying any of these inventions or produced through the use of any of these inventions be manufactured substantially in the United States. This preference for U.S. industry may be waived by the federal agency that provided the funding if the owner or assignee of the intellectual property can show that reasonable but unsuccessful efforts have been made to grant licenses on similar terms to potential licensees that would be likely to manufacture substantially in the United States or that under the circumstances domestic manufacture is not commercially feasible. This preference for U.S. industry may limit our ability to contract with non-U.S. product manufacturers for products covered by such intellectual property.

We may become involved in lawsuits to protect or enforce our intellectual property, which could be expensive, time-consuming and unsuccessful and have an adverse effect on the success of our business.

Third parties may infringe our patents or misappropriate or otherwise violate our intellectual property rights. Our patent applications cannot be enforced against third parties practicing the technology claimed in these applications unless and until a patent issues from the applications, and then only to the extent the issued claims cover the technology. In the future, we or our partners may elect to initiate legal proceedings to enforce or defend our or our partners' intellectual property rights, to protect our or our partners' trade secrets or to determine the validity or scope of our intellectual property

rights. Any claims that we or our partners assert against perceived infringers could also provoke these parties to assert counterclaims against us or our partners alleging that we or our partners infringe their intellectual property rights or that our intellectual property rights are invalid. In patent litigation in the United States, defendant counterclaims alleging noninfringement, invalidity and/or unenforceability are commonplace, and there are numerous grounds upon which a third party can assert noninfringement, invalidity or unenforceability of a patent. The outcome following legal assertions of noninfringement, unpatentability, invalidity and unenforceability is unpredictable. With respect to the validity of patent rights, for example, we cannot be certain that there is no invalidating prior art, of which we, our patent counsel and the patent examiner were unaware during prosecution. If a defendant were to prevail on a legal assertion of unpatentability, invalidity and/or unenforceability, we would lose at least part, and perhaps all, of the patent protection on our product candidates. Such a loss of patent protection could have a material adverse impact on our business.

Interference, derivation or opposition proceedings provoked by third parties, brought by us or our partners, or brought by the USPTO or any non-U.S. patent authority, may be necessary to determine the priority of inventions or matters of inventorship with respect to our patents or patent applications. We or our partners may also become involved in other proceedings, such as reexamination or opposition proceedings, inter partes review, post-grant review or other preissuance or post-grant proceedings in the USPTO or its foreign counterparts relating to our intellectual property or the intellectual property of others. Such proceedings could result in revocation or amendment to our patents in such a way that they no longer cover and protect our product candidates. An unfavorable outcome in any of these proceedings could require us or our partners to cease using the related technology and commercializing our product candidates, or to attempt to license rights to it from the prevailing party. Our business could be harmed if the prevailing party does not offer us or our partners a license on commercially reasonable terms if any license is offered at all. Even if we or our licensors obtain a license, it may be non-exclusive, thereby giving our competitors access to the same technologies licensed to us or our licensors. 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 product candidates.

Any intellectual property proceedings can be expensive and time-consuming. Our or our partners' adversaries in these proceedings may have the ability to dedicate substantially greater resources to prosecuting these legal actions than we or our partners can. Accordingly, despite our or our partners' efforts, we or our partners may not be able to prevent third parties from infringing upon or misappropriating our intellectual property rights, particularly in countries where the laws may not protect our rights as fully as in the U.S. Even if we are successful in the relevant proceedings, we may incur substantial costs and the time and attention of our management and scientific personnel could be diverted from other activities. In addition, in an infringement proceeding, a court may decide that one or more of our patents is invalid or unenforceable, in whole or in part, 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, and/or may require us to pay the other party attorneys' fees. An adverse result in any litigation proceeding could put one or more of our patents at risk of being invalidated, held unenforceable or interpreted narrowly.

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. In addition, there could be public announcements of the results of hearings, motions or other interim proceedings or developments.

We may be subject to claims challenging the inventorship of our patents and other intellectual property.

We may in the future be subject to claims that former employees, collaborators, or other third parties have an interest in our patents or other intellectual property as an inventor or co-inventor. For example, we may have inventorship disputes arise from conflicting obligations of consultants or others who are involved in developing our product candidates. Litigation may be necessary to defend against these and other claims challenging inventorship. 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, intellectual property. Such an outcome could have a material adverse effect on our business. Even if we are successful in defending against such claims, litigation could result in substantial costs and be a distraction to management and other employees.

If we are unable to protect the confidentiality of our trade secrets and other proprietary information, the value of our technology could be adversely affected and our business could be harmed.

In addition to seeking the protection afforded by patents, we rely on trade secret protection and confidentiality agreements to protect proprietary know-how that is not patentable or that we elect not to patent, processes for which patents

are difficult to enforce, and other elements of our technology, discovery and development processes that involve proprietary know-how, information or technology that is not covered by patents. Any disclosure to or misappropriation by third parties of our confidential proprietary information could enable competitors to quickly duplicate or surpass our technological achievements, including by enabling them to develop and commercialize products substantially similar to or competitive with our product candidates, thus eroding our competitive position in the market.

Trade secrets can be difficult to protect. We seek to protect our proprietary, confidential technology and processes, in part, by entering into confidentiality agreements and invention assignment agreements with our employees, consultants and outside scientific advisors, contractors and collaborators. These agreements are designed to protect our proprietary information. Although we use reasonable efforts to protect our trade secrets, our employees, consultants, contractors, or outside scientific advisors might intentionally or inadvertently disclose our trade secrets or confidential, proprietary information to competitors. In addition, competitors may otherwise gain access to our trade secrets or independently develop substantially equivalent information and techniques. If any of our confidential proprietary information were to be lawfully obtained or independently developed by a competitor, we would have no right to prevent such competitor from using that technology or information to compete with us, which could harm our competitive position.

Enforcing a claim that a third party illegally obtained and is using any of our trade secrets is expensive and time consuming, and the outcome is unpredictable. In addition, the laws of certain foreign countries do not protect proprietary rights such as trade secrets to the same extent or in the same manner as the laws of the U.S. Misappropriation or unauthorized disclosure of our trade secrets to third parties could impair our competitive advantage in the market and could adversely affect our business, results of operations and financial condition.

We may be subject to claims that our employees, consultants or independent contractors have breached non-compete or non-solicit obligations and/or wrongfully used or disclosed confidential information of third parties.

We have received confidential and proprietary information from third parties. In addition, we employ individuals who were previously employed at other biotechnology or pharmaceutical companies. We may be subject to claims that we or our employees, consultants or independent contractors have inadvertently or otherwise breached non-compete or non-solicit obligations with respect to such individuals' prior employers, or used or disclosed confidential information of these third parties or such individuals' former employers. Dealing with such claims and negotiating with potential claimants could result in substantial cost and be a distraction to our management and employees. In addition, litigation may be necessary to defend against these claims, and even if we are successful in defending against these claims, such litigation could result in further costs to us and distraction to our management and employees.

Risks Related to Ownership of Our Common Stock

Delaware law and provisions in our amended and restated certificate of incorporation and bylaws might discourage, delay, or prevent a change in control of our company or changes in our management and, therefore, depress the trading price of our common stock.

Provisions in our amended and restated certificate of incorporation and bylaws may discourage, delay, or prevent a merger, acquisition, or other change in control that stockholders may consider favorable, including transactions in which you might otherwise receive a premium for your shares of our common stock. These provisions may also prevent or frustrate attempts by our stockholders to replace or remove our management. Therefore, these provisions could adversely affect the price of our common stock. Among other things, our organizational documents:

- establish that our board of directors is divided into three classes, Class I, Class II and Class III, with each class serving staggered three-year terms;
- provide that our directors may be removed only for cause;
- provide that vacancies on our board of directors may be filled only by a majority of directors then in office, even though less than a quorum;
- eliminate cumulative voting in the election of directors;
- authorize our board of directors to issue shares of preferred stock and determine the price and other terms of those shares, including preferences and voting rights, without stockholder approval;
- permit stockholders to take actions only at a duly called annual or special meeting and not by unanimous written consent;
- prohibit stockholders from calling a special meeting of stockholders;

- require that stockholders give advance notice to nominate directors or submit proposals for consideration at stockholder meetings;
- authorize our board of directors, by a majority vote, to amend certain provisions of the bylaws; and
- require the affirmative vote of at least 66 2/3% or more of the outstanding shares of common stock to amend many of the provisions described above.

In addition, Section 203 of the General Corporation Law of the State of Delaware (DGCL) prohibits a publicly-held Delaware corporation from engaging in a business combination with an interested stockholder, which is generally a person which together with its affiliates owns, or within the last three years has owned, 15% of our voting stock, for a period of three years after the date of the transaction in which the person became an interested stockholder, unless the business combination is approved in a prescribed manner.

Any provision of our amended and restated certificate of incorporation, amended and restated bylaws, or Delaware law that has the effect of delaying or preventing a change in control could limit the opportunity for our stockholders to receive a premium for their shares of our capital stock and could also affect the price that some investors are willing to pay for our common stock.

Our amended and restated certificate of incorporation provides that the Court of Chancery of the State of Delaware will 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, unless we consent in writing to the selection of an alternative forum, the Court of Chancery of the State of Delaware will be 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 asserting a claim of breach of a fiduciary duty owed by any of our directors, officers or other employees, or stockholders to us or our stockholders;
- any action asserting a claim arising pursuant to any provision of the DGCL or our amended and restated certificate of incorporation and bylaws; and
- any action asserting a claim governed by the internal affairs doctrine.

Furthermore, our amended and restated certificate of incorporation also provides that unless we consent in writing to the selection of an alternative forum, the federal district courts of the United States shall be the exclusive forum for the resolution of any complaint asserting a cause of action arising under the Securities Act of 1933, as amended (Securities Act). However, these provisions would not apply to suits brought to enforce a duty or liability created by the Exchange Act or any other claim for which the federal courts have exclusive jurisdiction. Any person purchasing or otherwise acquiring or holding any interest in shares of our capital stock is deemed to have received notice of and consented to the foregoing provisions. These choice of forum provisions may limit a stockholder's ability to bring a claim in a judicial forum that it finds more favorable for disputes with us or with our directors, officers, other employees or agents, or our other stockholders, which may discourage such lawsuits against us and such other persons, or may result in additional expense to a stockholder seeking to bring a claim against us. Alternatively, if a court were to find this choice of forum provision inapplicable to, or unenforceable in respect of, one or more of the specified types of actions or proceedings, we may incur additional costs associated with resolving such matters in other jurisdictions, which could adversely affect our business, results of operations and financial condition.

We have in the past identified a material weakness in our internal control over financial reporting. If we identify additional material weaknesses in the future or otherwise fail to maintain effective internal control over financial reporting, we may not be able to accurately or timely report our financial condition or results of operations, which may significantly harm our business and the value of our common stock.

As a public company, we are required to maintain internal control over financial reporting and to report any material weaknesses in such internal control. Section 404 of the Sarbanes-Oxley Act (Section 404) requires that we evaluate and determine the effectiveness of our internal control over financial reporting. This assessment needs to include the disclosure of any material weaknesses in such internal control. A material weakness is a deficiency or combination of deficiencies in internal control over financial reporting such that there is a reasonable possibility that a material misstatement of our consolidated financial statements will not be prevented or detected on a timely basis.

In connection with the finalization of our consolidated financial statements as of and for the year ended December 31, 2019, we and our independent auditors concluded that a material weakness existed in our internal control over financial reporting relating to the review of the technical accounting for settlement of tranche liabilities. Specifically, in connection with our Series A preferred stock financing in 2019, we recorded a correcting adjustment to increase other non-operating expense for the change in fair value of the Series A preferred tranche liability after we initially recorded the amount as a deemed dividend. There were and have been no other tranche liabilities after the settlement of this liability in February 2019.

Although we believe that we have remediated this material weakness by hiring additional accounting and financial reporting personnel and have not identified any material weaknesses in connection with the finalization of our consolidated financial statements as of and for the year ended December 31, 2021, we cannot assure you that we will not identify other material weaknesses in the future.

Furthermore, we may not have identified all material weaknesses, and our current controls and any new controls that we develop may become inadequate because of changes in personnel or conditions in our business or otherwise. Accordingly, we cannot assure you that any future material weaknesses will not result in a material misstatement of our consolidated financial statements and/or our failure to meet our public reporting obligations. In addition, if we and/or our independent registered public accounting firm are unable to conclude that our internal control over financial reporting is effective in the future, investor confidence in the accuracy and completeness of our consolidated financial statements would be adversely affected, which could significantly harm our business and the value of our common stock.

General Risk Factors

If we fail to maintain proper and effective internal controls over financial reporting our ability to produce accurate and timely consolidated financial statements could be impaired.

Pursuant to Section 404, our management will be required to report upon the effectiveness of our internal control over financial reporting beginning with our second filing of an Annual Report on Form 10-K with the U.S. Securities and Exchange Commission (SEC). When we lose our status as an "emerging growth company" and become an "accelerated filer" or a "large accelerated filer," our independent registered public accounting firm will be required to attest to the effectiveness of our internal control over financial reporting. 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 requirements of being a reporting company under the Exchange Act, we will need to implement additional financial and management controls, reporting systems and procedures, and hire additional accounting and finance staff.

We cannot assure you that there will not be future material weaknesses or significant deficiencies 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 we have a material weakness or significant deficiency 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 The Nasdaq Stock Market, 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 disclosure controls and procedures may not prevent or detect all errors or acts of fraud.

We are subject to the periodic reporting requirements of the Exchange Act and we must maintain disclosure controls and procedures designed 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. For example, our directors or executive officers could inadvertently fail to disclose a new relationship or arrangement causing us to fail to make a required related party transaction disclosure. 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.

The market price of our common stock may be volatile, which could result in substantial losses for investors.

The market price of our common stock may be volatile and may fluctuate substantially as a result of a variety of factors, many of which are beyond our control. Some of the factors that may cause the market price of our common stock to fluctuate are listed below and other factors described in this "Risk Factors" section:

- the timing and results of preclinical studies and clinical trials for our product candidates;
- failure or discontinuation of any of our product development and research programs;
- the success of existing or new competitive product candidates or technologies;
- results of clinical trials, or regulatory approvals of our competitors;
- commencement or termination of collaborations for our product development and research programs;
- regulatory or legal developments in the United States and other countries;
- the recruitment or departure of key personnel;
- developments or disputes including those concerning patent applications, issued patents, or other proprietary rights;
- the impact of the COVID-19 pandemic on our business and on global economic conditions;
- labor discord or disruption, geopolitical events, social unrest, war, including repercussions of the recent military conflict between Russia and Ukraine, terrorism, political instability, acts of public violence, boycotts, hostilities and social unrest and other health pandemics;
- the level of expenses related to any of our research programs or clinical development programs;
- actual or anticipated changes in our estimates as to our financial results or development timelines;
- whether our financial results, forecasts and development timelines meet the expectations of securities analysts or investors;
- announcement or expectation of additional financing efforts;
- sales of our common stock by us, our insiders, or other stockholders;
- changes in estimates or recommendations by securities analysts, if any, that cover our stock;
- market conditions in the healthcare sector;
- general economic, industry and market conditions; and
- the other factors described in this "Risk Factors" section.

In recent years, stock markets in general, and the market for biotechnology companies in particular, have experienced significant price and volume fluctuations that have often been unrelated or disproportionate to changes in the operating performance of the companies whose stock is experiencing those price and volume fluctuations. Broad market and industry factors may seriously affect the market price of our common stock, regardless of our actual operating performance. Following periods of such volatility in the market price of a company's securities, securities class action litigation has often been brought against that company. Because of the potential volatility of our stock price, we may become the target of securities litigation in the future. Securities litigation could result in substantial costs and divert management's attention and resources from our business.

If securities or industry analysts do not publish research or reports about our business, or if they publish negative or neutral evaluations of our stock, the price of our stock could decline.

The trading market for our common stock relies in part on the research and reports that industry or securities analysts publish about us or our business. If one or more of the analysts covering our business initiate coverage with a neutral or sell rating or downgrade their evaluations of our stock, the price of our stock could decline. If one or more of these analysts cease to cover our stock, we could lose visibility in the market for our stock, which in turn could cause our stock price to decline.

Sales of a substantial number of shares of our common stock by our existing stockholders could cause the price of our common stock to decline.

Sales of a substantial number of shares of our common stock in the public market could occur at any time or the perception in the market that the holders of a large number of shares of common stock intend to sell shares, and could reduce the market price of our common stock. As of December 31, 2021, we have 245,338,352 shares of common stock outstanding. Substantially all of the shares of our common stock outstanding and shares issued upon the exercise of stock options outstanding under our equity incentive plans, subject to applicable securities law restrictions and excluding shares of restricted stock that will remain unvested, may be able to be sold in the public market.

Moreover, holders of shares of our common stock will have rights, subject to conditions, to require us to file registration statements with the SEC covering their shares or to include their shares in registration statements that we may file for ourselves or other stockholders. If any of these additional shares are sold, or if it is perceived that they will be sold, in the public market, the market price of our common stock could decline.

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

We may seek additional capital through a combination of public and private equity offerings, debt financings, strategic partnerships and alliances and licensing arrangements. We, and indirectly, our stockholders, will bear the cost of issuing and servicing securities issued in any such transactions. Because our decision to issue debt or equity securities in any future offering will depend on market conditions and other factors beyond our control, we cannot predict or estimate the amount, timing or nature of any future offerings. To the extent that we raise additional capital through the sale of equity or 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 restrictive covenants, such as limitations on our ability to incur additional debt, limitations on our ability to acquire, sell, or license intellectual property rights and other operating restrictions that could adversely impact our ability to conduct our business. Additionally, any future collaborations we enter into with third parties may provide capital in the near term but limit our potential cash flow and revenue in the future. If we raise additional funds through strategic partnerships, alliances, or licensing arrangements with third parties, we may have to relinquish valuable rights to our technologies or our products, or grant licenses on terms unfavorable to us. Certain of the foregoing transactions may require us to obtain stockholder approval, which we may not be able to obtain.

We are an "emerging growth company," and the reduced disclosure requirements applicable to emerging growth companies may make our common stock less attractive to investors.

We are an "emerging growth company" as defined in the JOBS Act. For so long as we remain an emerging growth company, we are permitted by SEC rules and plan to rely on exemptions from certain disclosure requirements that are applicable to other SEC-registered public companies that are not emerging growth companies. These exemptions include not being required to comply with the auditor attestation requirements of Section 404, not being required to comply with the auditor requirements to communicate critical audit matters in the auditor's report on the financial statements, reduced disclosure obligations regarding executive compensation, and exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and stockholder approval of any golden parachute payments not previously approved. As a result, the information we provide stockholders will be different than the information that is available with respect to other public companies. We may choose to take advantage of some, but not all, of the available exemptions. We cannot predict whether investors will find our common stock less attractive if we rely on these exemptions. If some investors find our common stock less attractive as a result, there may be a less active trading market for our common stock, and our stock price may be more volatile.

In addition, the JOBS Act provides that an emerging growth company can take advantage of an extended transition period for complying with new or revised accounting standards. This allows an emerging growth company to delay the adoption of certain accounting standards until those standards would otherwise apply to private companies. We have irrevocably elected not to avail ourselves of this exemption from new or revised accounting standards, and, therefore, we will be subject to the same new or revised accounting standards as other public companies that are not emerging growth companies.

Future acquisitions, strategic investments, partnerships, or alliances could be difficult to identify and integrate, divert the attention of management, disrupt our business, dilute stockholder value and adversely affect our operating results and financial condition.

We may in the future seek to acquire or invest in businesses, products or technologies that we believe could complement or expand our technology platforms, enhance our technical capabilities, or otherwise offer growth opportunities. The pursuit of potential acquisitions or strategic investments may divert the attention of management and cause us to incur various expenses in identifying, investigating and pursuing suitable acquisitions or investments, whether or not such transactions are completed. In addition, we have only limited experience in acquiring or investing in other businesses, and we may not successfully identify desirable targets, or if we acquire additional businesses, we may not be able to integrate them effectively. following the acquisition. Acquisitions could also result in dilutive issuances of equity securities or the incurrence of debt, as well as unfavorable accounting treatment and exposure to claims and disputes by third parties, including intellectual property claims. We also may not generate sufficient financial returns to offset the costs and expenses related to any acquisitions. In addition, if an acquired business fails to meet our expectations, our business, operating results and financial condition may suffer.

The requirements of being a public company require our management to devote substantial time to compliance initiatives and corporate governance practices and could divert management's attention and strain our resources.

As a public company, and particularly after we are no longer an emerging growth company, we incur and will continue to incur significant legal, accounting, and other expenses that we did not incur as a private company. Section 404, the Dodd-Frank Wall Street Reform and Consumer Protection Act, the listing requirements and rules of The Nasdaq Stock Market LLC (Nasdaq Listing Rules), and other applicable U.S. rules and regulations impose various requirements on public companies, including establishment and maintenance of effective disclosure and financial controls and corporate governance practices. We continue to need to hire additional accounting, finance and other personnel in connection with our efforts to comply with the requirements of being, a public company, and our management and other personnel will continue to need to devote a substantial amount of time towards maintaining compliance with these requirements. These requirements have and will increase our legal and financial compliance costs and will make some activities more time-consuming and costly. For example, the rules and regulations applicable to us as a public company have made it more expensive for us to obtain director and officer liability insurance. We cannot predict or estimate the amount of additional costs we may incur or the timing of such costs. These rules and regulations are often subject to varying interpretations, in many cases due to their lack of specificity, and, as a result, their application in practice may evolve over time as new guidance is provided by regulatory and governing bodies. This could result in continuing uncertainty regarding compliance matters and higher costs necessitated by ongoing revisions to disclosure and governance practices.

Our ability to use our net operating loss carryforwards and certain other tax attributes may be limited.

Under the Tax Cuts and Jobs Act of 2017 (the Tax Act), as modified by the Coronavirus Aid, Relief, and Economic Security Act (the CARES Act), our net operating losses (NOLs) generated in tax years beginning after December 31, 2017, may be carried forward indefinitely, but the deductibility of such federal NOLs in tax years beginning after December 31, 2020, is limited to 80% of taxable income. It is uncertain if and to what extent various states will conform to the Tax Act or the CARES Act. In addition, under Sections 382 and 383 of the U.S. Internal Revenue Code of 1986, as amended (the Code), if a corporation 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 three-year period, the corporation's ability to use its pre-change NOLs and other pre-change tax attributes (such as research and development tax credits) to offset its post-change income or taxes may be limited. We may have experienced ownership changes in the past and may experience ownership changes as a result of our IPO and/or subsequent shifts in our stock ownership (some of which may be outside our control). As a result, our ability to use our pre-change NOLs and tax credits to offset post-change taxable income, if any, could be subject to limitations. Similar provisions of state tax law may also apply. In addition, at the state level, there may be periods during which the use of NOLs is suspended or otherwise limited, which could accelerate or permanently increase state taxes owed. For example, California recently imposed limits on the usability of California state NOLs and tax credits to offset California taxable income in tax years beginning after December 31, 2019 and before January 1, 2023. As a result, even if we attain profitability, we may be unable to use a material portion of our NOLs and tax credits.

Our business and operations would suffer in the event of computer system failures or security breaches.

Our internal computer systems, and those of our partners, are vulnerable to damage from computer viruses, unauthorized access, natural disasters, fire, terrorism, war and telecommunication and electrical failures. We exercise little or no control over these third parties, which increases our vulnerability to problems with their systems. To the extent that

any disruption or security breach results in a loss of or damage to our data or applications, or inappropriate disclosure of confidential or proprietary information, we could incur liability, the further development of our product candidates could be delayed and our business could be otherwise adversely affected.

While we have not experienced any material system failure, accident or security breach to date, we cannot assure you that our data protection efforts and our investment in information technology will prevent significant breakdowns, data leakages, breaches in our systems or other cyber incidents that could have a material adverse effect upon our reputation, business, operations or financial condition. For example, if such an event were to occur and cause interruptions in our operations, it could result in a material disruption of our programs and the development of our product candidates could be delayed. In addition, the loss of clinical trial data for our product candidates could result in delays in our marketing approval efforts and significantly increase our costs to recover or reproduce the data. Furthermore, significant disruptions of our internal information technology systems or security breaches could result in the loss, misappropriation, and/or unauthorized access, use, or disclosure of, or the prevention of access to, confidential information (including trade secrets or other intellectual property, proprietary business information, and personal information), which could result in financial, legal, business, and reputational harm to us. For example, any such event that leads to unauthorized access, use, or disclosure of personal information, including personal information regarding our clinical trial subjects or employees, could harm our reputation directly, compel us to comply with federal and/or state breach notification laws and foreign law equivalents, subject us to mandatory corrective action, and otherwise subject us to liability under laws and regulations that protect the privacy and security of personal information, which could result in significant legal and financial exposure and reputational damages that could potentially have an adverse effect on our business.

Indemnity provisions in various agreements potentially expose us to substantial liability for intellectual property infringement, data protection and other losses.

Our agreements with third parties may include indemnification provisions under which we agree to indemnify them for losses suffered or incurred as a result of claims of intellectual property infringement or other liabilities relating to or arising from our contractual obligations. Large indemnity payments could harm our business and financial condition. Although we normally contractually limit our liability with respect to such obligations, we may still incur substantial liability. Any dispute with a third party with respect to such obligations could have adverse effects on our relationship with that third party and relationships with other existing or new partners, harming our business.

Item 1B. Unresolved Staff Comments

None.

Item 2. Properties

California

Our current corporate headquarters is located in South San Francisco, California, where we lease approximately 108,000 square feet of office and laboratory space, pursuant to a lease agreement that commenced on February 1, 2020 and expires on March 31, 2031.

Washington

We lease approximately 34,000 square feet of office and laboratory space in Seattle, Washington, pursuant to a lease agreement that commenced on January 1, 2019 and expires on December 31, 2028. We lease approximately 73,000 square feet of manufacturing, office and laboratory space in Bothell, Washington, pursuant to a lease agreement that commenced on February 1, 2020 and expires on May 31, 2030.

We believe that these existing facilities will be adequate for our near-term needs. If required, we believe that suitable additional or alternative space would be available in the future on commercially reasonable terms.

Item 3. Legal Proceedings

From time to time, we have been or may become involved in material legal proceedings or be subject to claims arising in the ordinary course of our business. For example, although not material to our operations, in February 2021 we filed a demand for arbitration to, among other things, seek rescission of the agreements we entered into with PACT in June 2020 and recover the consideration paid to PACT thereunder. An arbitration hearing occurred in March 2022. We expect to

receive the outcome of the arbitration panel in June 2022. Litigation is subject to inherent uncertainties, and an adverse result in these or other matters may arise from time to time that may harm our business.

We are currently not party to any legal proceedings material to our operations or of which any of our property is the subject, nor are we aware of any such proceedings that are contemplated by a government authority.

Regardless of outcome, such proceedings or claims can have an adverse impact on us because of defense and settlement costs, diversion of resources and other factors, and there can be no assurances that favorable outcomes will be obtained.

Item 4. Mine Safety Disclosures

Not applicable.

PART II

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

Our common stock has traded on the Nasdaq Global Select Market under the symbol “LYEL” since June 17, 2021. Prior to that date, there was no public trading market for our common stock.

Holders

On March 25, 2022, there were 104 holders of record of our common stock. The number of record holders is based upon the actual number of holders registered on our books at such date and does not include holders of shares in “street names” or persons, partnerships, associations, corporations or other entities identified in security position listings maintained by depository trust companies.

Dividends

Since inception, we have not paid dividends on our common stock. We currently intend to retain all future earnings, if any, for use in our business and currently do not plan to pay any cash dividends in the foreseeable future. Any future determination to pay dividends will be at the discretion of our Board of Directors.

Unregistered Sales of Equity Securities

None.

Repurchases of Equity Securities

None.

Use of Proceeds from our Initial Public Offering of Common Stock

In June 2021, we closed an initial public offering (IPO) and issued and sold 25,000,000 shares of our common stock, at a public offering price of $17.00 per share, for net proceeds of $391.8 million, after deducting underwriting discounts and commissions of $29.8 million and offering expenses of $3.4 million. All of the shares issued and sold in the IPO were registered under the Securities Act pursuant to a Registration Statement on Form S-1 (File No. 333-256470), which was declared effective by the SEC on June 16, 2021. Goldman Sachs & Co. LLC, BofA Securities, Inc., J.P. Morgan Securities LLC and Morgan Stanley & Co. LLC, acted as joint bookrunning managers of the IPO and as representatives of the underwriters. No offering expenses were paid directly or indirectly to any of our directors or officers (or their associates) or persons owning 10.0% or more of any class of our equity securities or to any other affiliates. We are holding a significant portion of the balance of the net proceeds from the offering in money market funds and short-term investments. There has been no material change in the planned use of proceeds from the IPO from that described in the prospectus filed with the SEC pursuant to Rule 424(b)(4) under the Securities Act on May 25, 2021.

Item 6. [Reserved]

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

You should read the following discussion and analysis of our financial condition and results of operations together with our audited consolidated financial statements and the related notes included elsewhere in this Annual Report on Form 10-K. This discussion and analysis and other parts of this Annual Report on Form 10-K contain forward-looking statements based upon current beliefs, plans and expectations related to future events and our future financial performance that involve risks, uncertainties and assumptions, such as statements regarding our intentions, plans, objectives and expectations for our business. Our actual results and the timing of selected events could differ materially from those described in or implied by these forward-looking statements as a result of several factors, including those set forth in the section titled "Risk Factors" in Part I, Item 1A of this Annual Report on Form 10-K. See also the section titled "Special Note Regarding Forward-Looking Statements."

This section under Management's Discussion and Analysis of Financial Condition and Results of Operations generally discusses 2021 and 2020 items and year-to-year comparisons between 2021 and 2020. Discussions of 2019 items and year-to-year comparisons between 2020 and 2019 that are not included in this Annual Report on Form 10-K can be found in the section titled "Management's Discussion and Analysis of Financial Condition and Results of Operations" in the prospectus we filed with the SEC pursuant to Rule 424(b)(4) under the Securities Act of 1933, as amended, on June 21, 2021.

Overview

We are a T-cell reprogramming company dedicated to the mastery of T cells to cure patients with solid tumors. We believe the key to effective cell therapy is the mastery of the identity, fate and function of cells to create living medicines. We take a systematic, interrogative, cell biology-driven approach to overcome what we view as the two major barriers to successful ACT – (1) T-cell exhaustion and (2) lack of durable stemness – through the application of our proprietary *ex vivo* genetic and epigenetic reprogramming technologies, Gen-R™ and Epi-R™. Our technologies are designed to be applied in a target and modality agnostic manner to chimeric antigen receptor (CAR), tumor-infiltrating lymphocytes (TIL) and T-cell receptor (TCR) therapies to fundamentally improve the properties of T cells needed to eradicate solid tumors. We believe our autologous T-cell therapies will generate improved, durable clinical outcomes that are potentially curative for patients with solid tumors. We are building a multi-modality product pipeline across several solid tumor indications with high unmet needs.

We are advancing a product pipeline of promising living cell product candidates across multiple ACT modalities that incorporate our Gen-R and Epi-R technology platforms. Each of our programs provide opportunities to expand into additional indications beyond the patient populations we are initially targeting.

For additional information regarding our business, see "Business" in Part I, Item 1 of this Annual Report on Form 10-K.

Pipeline Programs and Operational Updates

Pipeline Programs

Phase 1 clinical development of two product candidates (LYL797, LYL132) has commenced and additional product candidates are in preclinical development (LYL845, LYL331). LYL797 and LYL845 are wholly-owned by Lyell, and LYL132 and LYL331 are being developed in collaboration with GSK.

LYL797 – CAR T-cell therapy targeting ROR1^{+} solid tumors, incorporating Gen-R and Epi-R

- Announced FDA clearance of the IND for LYL797, a chimeric antigen receptor (CAR) T-cell therapy for patients with solid tumors expressing receptor tyrosine kinase-like orphan receptor 1 (ROR1^{+}).
- Screening initiated for the Phase 1 open label dose escalation and expansion trial with relapsed/refractory triple-negative breast cancer or non-small cell lung cancer who have failed at least two lines of therapy, initial data expected in 2023.

LYL132 – TCR therapy targeting NY-ESO-1 solid tumors, incorporating Epi-R

- Announced FDA clearance of the IND for LYL132, a T-cell receptor (TCR) therapy developed in collaboration with GSK for patients with solid tumors expressing New York esophageal squamous cell carcinoma 1 (NY-ESO-1).

LYL845 - TIL therapy designed to target multiple solid tumor indications, incorporating Epi-R

- On track to submit an IND in the second half of 2022 for LYL845, a tumor infiltrating lymphocyte (TIL) therapy.
- Initially targeting melanoma, with plans to expand into additional solid tumor indications.

LYL331 - TCR therapy targeting NY-ESO-1 solid tumors, incorporating Gen-R

- GSK has communicated to us that due to updated manufacturing timing, the IND for LYL331 is likely to be submitted in late 2022/early 2023.
- LYL331 is a TCR therapy developed in collaboration with GSK for patients with solid tumors expressing New York esophageal squamous cell carcinoma 1 (NY-ESO-1).
- LYL331 incorporates Gen-R and, along with LYL132, is under investigation as a potential next-generation enhancement to lete-cel.

Operational Updates

- Announced cGMP qualification of LyFE™, Lyell's manufacturing facility designed to produce cell products at scale for upcoming clinical trials across its CAR, TIL and TCR products.

COVID-19 Update

The global COVID-19 pandemic continues to evolve rapidly, and we will continue to monitor it closely. The extent of the impact of the COVID-19 pandemic on our business, operations and development timelines and plans remains uncertain and will depend on certain developments, including the duration and spread of the outbreak and its impact on our clinical trial plans, CROs, contract manufacturing organizations and other third parties with whom we do business, as well as its impact on regulatory authorities and our key scientific and management personnel. While the implications of the COVID-19 pandemic on our operations remain uncertain, to date, we have not experienced delays in our discovery and development activities as a result of the COVID-19 pandemic. However, there can be no assurance that we will be able to avoid materially adverse impacts from the evolving effects of the COVID-19 pandemic. In this regard, site initiation and patient enrollment may be delayed due to prioritization of hospital resources toward the COVID-19 pandemic, which may delay enrollment in our current and planned clinical trials, and some patients may not be able to comply with clinical trial protocols if quarantines impede patient movement or interrupt healthcare services, and we may be unable to obtain blood samples for testing. For example, limitations or modifications in surgery scheduling for oncology patients at collaborating institutions has limited and may continue to limit supply of patient tumor samples that we use in our research. We have closely monitored the COVID-19 pandemic and have strived to follow recommended containment and mitigation measures, including the guidance from the Centers for Disease Control and Prevention (CDC) as well as the states of California and Washington and applicable counties. For most of the pandemic, essential laboratory and support employees worked in our facilities to continue and progress experiments. We implemented preventative measures at our facilities in order to minimize the risk of employee exposure to the virus, including the following requirements: that each employee who entered a facility agreed to comply with social distancing, frequent hand washing and the requirement to wear masks. We also increased cleaning of high touch areas, provided hand sanitizing stations and implemented an employee questionnaire to ensure employee health status and to provide for limited on-site tracing if needed. Finally, commencing in early March 2020, we suspended all non-essential business travel and adopted a work from home policy in which work that can be done from home is encouraged and allowed to be done from home. We expect to continue such measures for the near foreseeable future, though we may allow certain designated groups of employees to return to our facilities on an as-needed basis if we determine that we may do so while continuing to maintain a safe work environment. We will continue to actively monitor the situation related to the COVID-19 pandemic and may take further actions that alter our operations, including those that may be required by federal, state or local authorities, or that we determine are in the best interests of our employees and other third parties with whom we do business.

Collaboration, License and Success Payment Agreements

For a detailed description of our collaboration, license and success payment agreements, see the section titled "Business—Collaboration, License and Success Payment Agreements" in Part I, Item 1 of this Annual Report on Form 10-K and Notes 2 and 3 to our audited consolidated financial statements included in Part II, Item 8 of this Annual Report on Form 10-K.

Components of Results of Operations

Revenue

We have no products approved for sale and have never generated any revenue from product sales.

To date, we have generated revenue primarily from the recognition of a portion of the upfront payment under the GSK Agreement that we entered into in May 2019. As we continue to conduct research under the GSK Agreement, we will recognize revenue based upon our estimate of the progress made. In the future, we may generate additional revenue from other collaborations, strategic alliances, licensing agreements, product sales or a combination of these.

Operating Expenses (Income)

Research and Development

To date, research and development expenses consist of costs incurred by us for the discovery and development of our technology platforms and product candidates, and includes costs incurred in connection with strategic collaborations, costs to license technology, personnel-related costs, including stock-based compensation expense, facility and technology related costs, research and laboratory expenses, as well as other expenses, which include consulting fees and other costs. Upfront payments and milestones paid to third parties in connection with technology platforms that have not reached technological feasibility and do not have an alternative future use are expensed as incurred.

Research and development expenses also include non-cash expense related to the change in the estimated fair value of the liabilities associated with our success payments granted to Fred Hutch and Stanford. See the subsection titled "Critical Accounting Policies and Estimates—Success Payments" below. Research and development expenses related to our success payment liabilities are unpredictable and may vary significantly from quarter to quarter and year to year due to changes in our assumptions used in the calculation.

We deploy our employee and infrastructure resources across multiple research and development programs for identifying and developing product candidates and establishing manufacturing capabilities. Due to the stage of development and number of ongoing programs and our ability to use resources across several programs, most of our research and development costs are not recorded on a program-specific basis. These include costs for personnel, laboratory and other indirect facility and operating costs.

Research and development activities account for a significant portion of our operating expenses. We anticipate that our research and development expenses will increase over the foreseeable future as we expand our research and development efforts including completing preclinical studies, commencing planned clinical trials, conducting and completing current and planned clinical trials, seeking regulatory approval of our product candidates, identifying new product candidates and incurring costs to acquire and license technology platforms. A change in the outcome of any of these variables could mean a significant change in the costs and timing associated with the development of our product candidates. Because we are early in our research and development efforts and just beginning clinical development of our product candidates, and the outcome of these efforts is uncertain, we cannot estimate the actual amounts necessary to successfully complete the preclinical development, clinical development and commercialization of product candidates or whether, or when, we may achieve profitability.

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

- the number and scope of preclinical and IND-enabling studies;
- per patient trial costs;
- the number of trials required for approval;
- the number of sites included in the trials;
- the countries in which the trials are conducted;
- the length of time required to enroll eligible patients;

- the number of patients that participate in the trials;
- the drop-out or discontinuation rates of patients;
- potential additional safety monitoring requested by regulatory agencies;
- the duration of patient participation in the trials and follow-up;
- the cost and timing of manufacturing our product candidates;
- the phase of development of our product candidates;
- the efficacy and safety profile of our product candidates;
- the extent to which we establish additional collaboration or license agreements; and
- whether we choose to partner any of our product candidates and the terms of such partnership.

A change in the outcome of any of these variables with respect to the development of any of our product candidates could significantly change the costs and timing associated with the development of that product candidate. We may never succeed in obtaining regulatory approval for any of our product candidates. We may obtain unexpected results from our preclinical studies and future clinical trials.

General and Administrative

General and administrative costs include personnel-related expenses, including stock-based compensation expense for personnel in executive, legal, finance and other administrative functions, legal costs, transaction costs related to collaboration and licensing agreements, as well as fees paid for accounting and tax services, consulting fees and facilities costs not otherwise included in research and development expenses. Legal costs include those related to corporate and patent matters.

We anticipate that our general and administrative expenses will increase over the foreseeable future to support our continued research and development activities, operations generally, future business development opportunities, consulting fees, as well as due to the increased costs of operating as a public company such as costs related to accounting, audit, legal, regulatory and tax-related services associated with maintaining compliance with exchange listing and SEC requirements, director and officer insurance costs and investor and public relations costs.

Other Operating Income, Net

Other operating income, net consists primarily of service and occupancy fees received associated with subleases as well as gains or losses on the sales of property and equipment.

Interest Income, Net

Interest income, net consists primarily of interest earned on our cash, cash equivalents and marketable securities balances.

Other (Expense) Income, Net

Other (expense) income, net consists primarily of changes in the fair value of an equity warrant investment held.

Impairment of Other Investments

Impairment of other investments consists of impairment of the PACT Series C-1 convertible preferred stock investment.

Deemed Dividends Upon Issuance or Repurchase of Convertible Preferred Stock

Deemed dividends upon issuance or repurchase of convertible preferred stock consists of the amount by which the fair value of the convertible preferred stock exceeded the cash proceeds from the sale and issuance of such convertible preferred stock or the amount by which the cash paid for the repurchase of convertible preferred stock exceeded the carrying value of such convertible preferred stock. Upon the closing of our IPO, all our convertible preferred stock was converted into our common stock.

Results of Operations

Years Ended December 31, 2021, 2020 and 2019

The following table summarizes our results of operations for the periods presented (in thousands):

	Year Ended December 31,			Change	
	2021	2020	2019	2021 vs 2020	2020 vs 2019
Revenue	$ 10,650	$ 7,756	$ 657	$ 2,894	$ 7,099
Operating expenses (income):					
Research and development	138,693	182,243	63,595	(43,550)	118,648
General and administrative	89,057	46,881	39,151	42,176	7,730
Other operating income, net	(2,324)	(9,431)	—	7,107	(9,431)
Total operating expenses	225,426	219,693	102,746	5,733	116,947
Loss from operations	(214,776)	(211,937)	(102,089)	(2,839)	(109,848)
Interest income, net	1,165	5,939	8,121	(4,774)	(2,182)
Other (expense) income, net	(161)	1,526	(35,409)	(1,687)	36,935
Impairment of other investments	(36,447)	—	—	(36,447)	—
Total other (loss) income, net	(35,443)	7,465	(27,288)	(42,908)	34,753
Net loss	(250,219)	(204,472)	(129,377)	(45,747)	(75,095)
Deemed dividends upon issuance or repurchase of convertible preferred stock	—	(3,582)	(1,144)	3,582	(2,438)
Net loss attributed to common stockholders	$ (250,219)	$ (208,054)	$ (130,521)	$ (42,165)	$ (77,533)

Revenue

Revenue was $10.7 million and $7.8 million for the years ended December 31, 2021 and 2020, respectively, primarily related to the recognized portion of the upfront license fee pursuant to the GSK Agreement. The increase of $2.9 million was primarily due to progress in research and development activities under the GSK Agreement.

Research and Development Expenses

The following table summarizes the components of our research and development expenses for the periods presented (in thousands):

	Year Ended December 31,			Change	
	2021	2020	2019	2021 vs 2020	2020 vs 2019
Personnel	$ 60,499	$ 54,112	$ 31,634	$ 6,387	$ 22,478
Facilities and technology	39,092	24,560	11,378	14,532	13,182
Collaborations, research activities and outside services	35,389	98,234	20,147	(62,845)	78,087
Success payments	3,713	5,337	436	(1,624)	4,901
Total research and development expenses	$ 138,693	$ 182,243	$ 63,595	$ (43,550)	$ 118,648

Research and development expenses were $138.7 million and $182.2 million for the years ended December 31, 2021 and 2020, respectively. The decrease of $43.6 million was primarily due to:

- a decrease of $62.8 million in collaborations, research activities and outside services expenses due to the commitment agreement upfront payment to PACT of $63.6 million and a decrease of $7.5 million in acquired in-process research and development expense related to the asset acquisition of Immulus, Inc., both recorded in 2020. These decreases were offset by a $4.8 million increase in costs associated with collaboration agreements and a $3.5 million increase related to professional services;
- a decrease of $1.6 million in success payment expenses associated with our Fred Hutch and Stanford success payment liabilities, primarily driven by the decrease in the per share fair value of our common stock;

- an increase of $14.5 million in facilities and technology costs, primarily related to increased infrastructure to support our expansion in research and development, manufacturing capabilities and associated headcount growth; and
- an increase of $6.4 million in personnel-related expenses, which was primarily related to an increase in headcount to expand our research, development and manufacturing capabilities.

General and Administrative Expenses

General and administrative expenses were $89.1 million and $46.9 million for the years ended December 31, 2021 and 2020, respectively. The increase of $42.2 million was primarily due to an increase of $28.6 million in stock-based compensation expense, primarily related to award modifications, accelerations and new awards granted, and $2.4 million increase in personnel-related expenses due to an increase in headcount to support our operations. Additionally, outside services and corporate expenses increased by $7.3 million due to certain litigation costs and an increase of $3.2 million in costs associated with operating as a public company.

Other Operating Income, Net

Other operating income, net was $2.3 million and $9.4 million for the years ended December 31, 2021 and 2020, respectively. The decrease of $7.1 million was due primarily to two significant gains that occurred in 2020, a gain recorded on the sale of assets of $4.9 million and a gain recorded upon lease remeasurement of $2.9 million.

Interest Income, Net

Interest income, net was $1.2 million and $5.9 million for the years ended December 31, 2021 and 2020, respectively. The decrease of $4.8 million was due to lower interest rates earned on cash, cash equivalents and marketable securities balances.

Other (Expense) Income, Net

For the years ended December 31, 2021 and 2020, other (expense) income, net consisted primarily of the change in fair value of an equity warrant investment held.

Impairment of Other Investments

For the year ended December 31, 2021, the $36.4 million impairment of other investments consisted of the full impairment of our investment in PACT Series C-1 convertible preferred stock.

Liquidity and Capital Resources

Sources of Liquidity

Since our inception, we have funded our operations primarily through the sale and issuance of convertible preferred stock, the sale of common stock in connection with our IPO and business development activities. As of December 31, 2021, we had $898.3 million in cash, cash equivalents and marketable securities. Since our inception, we have incurred significant operating losses. We have not yet commercialized any product candidates and we do not expect to generate revenue from sales of any product candidates for a number of years, if ever. We had an accumulated deficit of $584.4 million as of December 31, 2021. From June 29, 2018 (inception) through December 31, 2021, we raised an aggregate of $1,405.7 million in gross proceeds from the sales of our convertible preferred stock.

Future Funding Requirements

We expect to incur additional losses in the foreseeable future as we conduct and expand our research and development efforts, including conducting preclinical studies and clinical trials, developing new product candidates, establishing internal manufacturing capabilities and funding our operations generally. Based on our current operating plan, we believe that our existing cash, cash equivalents and marketable securities will be sufficient to meet our working capital and capital expenditure needs into 2025. However, we anticipate that we will need to raise additional capital in the future to fund our operations, including the commercialization of any approved product candidates. We are subject to the risks typically related to the development of new products, and we may encounter unforeseen expenses, difficulties, complications, delays and other unknown factors that may adversely affect our business.

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

- the scope, timing, progress, costs and results of discovery, preclinical development and clinical trials for our current and future product candidates;
- the number of clinical trials required for regulatory approval of our current and future product candidates;
- the costs, timing and outcome of regulatory review of any of our current and future product candidates;
- the cost of manufacturing clinical and commercial supplies of our current and future product candidates;
- the costs and timing of future commercialization activities, including manufacturing, marketing, sales and distribution, for any of our product candidates for which we receive marketing approval;
- further investment to build additional manufacturing facilities or expand the capacity of our existing ones;
- the costs and timing of preparing, filing and prosecuting patent applications, maintaining and enforcing our intellectual property rights and defending any intellectual property-related claims;
- our ability to maintain existing, and establish new, collaborations, licenses, product acquisitions or other strategic transactions and the fulfillment of our financial obligations under any such agreements, including the timing and amount of any success payment, future contingent, milestone, royalty or other payments due under any such agreement;
- the revenue, if any, received from commercial sales of our product candidates for which we receive marketing approval;
- expenses to attract, hire and retain skilled personnel;
- the costs of operating as a public company;
- addressing any potential interruptions or delays resulting from factors related to the COVID-19 pandemic;
- addressing or responding to any potential disputes or litigation; and
- the extent to which we acquire or invest in businesses, products and technology platforms.

Until such time as we complete preclinical and clinical development and receive regulatory approval of our product candidates and can generate significant revenue from product sales, if ever, we expect to finance our operations from the sale of additional equity or debt financings, or other capital which come in the form of strategic collaborations, licensing, or other arrangements. In the event that additional capital is required, we may not be able to raise it on terms acceptable to us, or at all. If we raise additional funds through the issuance of equity or convertible debt securities, it may result in dilution to our existing stockholders. Debt financing or preferred equity financing, if available, may result in increased fixed payment obligations, and the existence of securities with rights that may be senior to those of our common stock. If we incur indebtedness, we could become subject to covenants that would restrict our operations. If we raise funds through strategic collaboration, licensing, or other arrangements, we may relinquish significant rights or grant licenses on terms that are not favorable to us. Our ability to raise additional funds may be adversely impacted by potential worsening global economic conditions and the recent disruptions to, and volatility in, the credit and financial markets in the United States and worldwide resulting from the ongoing COVID-19 pandemic and otherwise. If we are unable to raise additional capital when desired, our business, results of operations and financial condition would be adversely affected.

Material Cash Requirements

We continually evaluate our liquidity and capital resources to ensure that we can adequately and efficiently finance our operations. As of December 31, 2021, our material cash requirements consisted primarily of paying salaries and benefits, administering clinical trials, providing the technology and facilities necessary to support our operations, operating lease obligations, potential success payments to Fred Hutch and Stanford and other payments related to our collaborative agreements. See Note 3, *Collaboration, License and Success Payment Agreements*, and Note 9, *Leases*, in the accompanying notes to our audited consolidated financial statements included in Part II, Item 8, of this Annual Report on Form 10-K for additional information.

Cash Flows

The following table summarizes our cash flows for the periods indicated (in thousands):

	Year Ended December 31,		
	2021	2020	2019
Net cash provided by (used in):			
Operating activities	$ (126,249)	$ (160,874)	$ 39,474
Investing activities	(121,573)	(273,516)	(422,433)
Financing activities	401,244	476,790	351,156
Net increase (decrease) in cash, cash equivalents and restricted cash	$ 153,422	$ 42,400	$ (31,803)

Operating Activities

During the year ended December 31, 2021, net cash used in operating activities was $126.2 million, consisting primarily of our net loss of $250.2 million, partially offset by certain non-cash items such as stock-based compensation expense of $62.2 million, impairment of other investments of $36.4 million, depreciation and amortization expense of $13.6 million and the change in fair value of success payment liabilities of $3.7 million. Additionally, net operating assets and liabilities increased $4.0 million, which included an increase in operating lease liabilities due to tenant improvement allowances received of $13.3 million offset by the recognition of $10.5 million of revenue previously recorded in deferred revenue.

Investing Activities

During the year ended December 31, 2021, cash used in investing activities was $121.6 million, consisting of net purchases of marketable securities of $56.1 million and capital expenditures of $65.5 million.

Financing Activities

During the year ended December 31, 2021, cash provided by financing activities was $401.2 million, consisting of $391.8 million in net proceeds from the sale of our common stock in our IPO and $9.4 million in proceeds from the exercise of stock options.

Critical Accounting Policies and Estimates

Our audited consolidated financial statements are prepared in accordance with GAAP. The preparation of these consolidated financial statements requires us to make estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the date of the audited consolidated financial statements, as well as the reported revenue and expenses incurred during the reporting periods. Our estimates are based on our historical experience and on various other factors that we believe are reasonable under the circumstances, the results of which form the basis for making judgments about the carrying value 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 more detail in the notes to our audited consolidated financial statements included in Part II, Item 8 of this Annual Report on Form 10-K, we believe that the following accounting policies are critical to understanding our historical and future performance, as these policies relate to the more significant areas involving management's judgments and estimates.

Revenue Recognition

We recognize revenue from research services generally as services are provided while revenue from non-refundable upfront fees are recognized over time by measuring progress towards satisfaction of the relevant performance obligation using the input method (i.e., cumulative actual costs incurred relative to total estimated costs).

The estimation of measure of progress is complex, involves significant judgment and is affected by our estimates of the total costs required to complete the performance obligations including the total internal personnel costs and external costs to be incurred. Changes in these estimates can have a material effect on our revenue recognition.

For a further description of our revenue recognition, see Note 2, *Basis of Presentation and Significant Accounting Policies,* in the accompanying notes to our audited consolidated financial statements included in Part II, Item 8, of this Annual Report on Form 10-K.

Success Payments

We are required to make success payments to Fred Hutch and Stanford based on increases in the per share market value of our common stock, payable in cash or cash equivalents or, at our discretion, publicly-tradeable shares of our common stock. The success payments are accounted for under ASC 718, *Compensation – Stock Compensation*, and are initially recorded at fair value with a corresponding charge to research and development expense. The liabilities are marked to market at each balance sheet date with all changes in value recognized in research and development expense in the consolidated statement of operations. Once their service periods are complete, the success payments will be accounted for under ASC 815, *Derivatives and Hedging*, and fair value changes will be recorded in other (expense) income, net. We will continue to adjust the liabilities for changes in fair value until the earlier of the achievement or expiration of the success payment obligation. To determine the estimated fair value of the success payments, we use a Monte Carlo simulation model, which models the value of the liability based on several key variables that require judgment, including the expected fair value and volatility of our common stock, estimated term and number of valuation measurement dates.

Stock-based Compensation

Stock-based compensation cost is measured at the grant date based on the fair value of the award. Prior to the closing of our IPO, the fair value of the common stock underlying our stock-based awards was estimated on each grant date by our board of directors using significant judgment to estimate the fair value of our common stock, including considering our stage of development; progress of our research and development efforts; the rights, preferences and privileges of our convertible preferred stock relative to those of our common stock; equity market conditions affecting comparable public companies; and the lack of marketability of our common stock. The fair value of stock-based awards is recognized as an expense on a straight-line basis over the requisite service period, with forfeitures recognized as they occur.

We use the Black-Scholes model to determine the fair value of our options. The Black-Scholes option pricing model requires the use of assumptions, including stock price volatility, the expected life of stock options, risk-free interest rate and the fair value of the underlying common stock on the date of grant. Our restricted stock awards are valued based on the fair market value of the award on the grant date.

Valuation of Other Investments

We have non-marketable equity investments that are accounted for using the measurement alternative. Under the measurement alternative, the carrying value is measured at cost, less any impairment, plus or minus changes resulting from observable price changes in orderly transactions for the identical or a similar investment of the same issuer. Determining whether an observed transaction is similar to a security within our portfolio requires judgment based on the rights and obligations of the securities. Recording upward and downward adjustments to the carrying value of our equity securities as a result of observable price changes requires quantitative assessments of the fair value of our securities using various valuation methodologies and involves the use of estimates.

Non-marketable equity securities are also subject to periodic impairment reviews. Our quarterly impairment analysis considers both qualitative and quantitative factors that may have a significant effect on the investment's fair value. Qualitative factors considered include the companies' financial and liquidity position, access to capital resources and the time since the last adjustment to fair value, among others. When indicators of impairment exist, we prepare quantitative assessments of the fair value of our equity investments using both the market and income approaches that require judgment and the use of estimates, including discount rates, investee revenues and costs, and comparable market data of private and public companies, among others. When our assessment indicates that an impairment exists, we write down the investment to its fair value.

In connection with the preparation of our financial statements for 2021, we performed a qualitative assessment of potential indicators of impairment and determined that indicators existed for our $36.4 million investment in PACT Series C-1 convertible preferred stock. While there was no single event or factor, we considered PACT's operating cash flow requirements over the next year and liquid asset balances to fund those requirements and their inability to raise funds as indicators of impairment. Due to these indicators, we assessed the valuation of our investment in PACT as of December 31, 2021 and determined the fair value to be negligible and the impairment to be other-than-temporary in nature. As a result, we recorded a $36.4 million impairment of our PACT investment in the fourth quarter of 2021. The impairment charge was recorded within impairment of other investments on the Consolidated Statement of Operations and Comprehensive Loss and as a reduction to the investment balance within other investments on the Consolidated Balance Sheet.

Recently Adopted and Recent Accounting Pronouncements

See Note 2, *Basis of Presentation and Significant Accounting Policies,* in the accompanying notes to our audited consolidated financial statements included in Part II, Item 8 of this Annual Report on Form 10-K for information about recent accounting pronouncements, the timing of their adoption and our assessment, to the extent we have made one yet, of their potential impact on our financial condition or results of operations.

JOBS Act Accounting Election

We are an "emerging growth company," as defined in the JOBS Act. For so long as we remain an emerging growth company, we are permitted and intend to rely on certain exemptions from various public company reporting requirements, including not being required to have our internal control over financial reporting audited by our independent registered public accounting firm pursuant to Section 404, reduced disclosure obligations regarding executive compensation in our periodic reports and proxy statement, and exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and any golden parachute payments not previously approved.

In addition, the JOBS Act provides that an emerging growth company can take advantage of an extended transition period for complying with new or revised accounting standards. This allows an emerging growth company to delay the adoption of certain accounting standards until those standards would otherwise apply to private companies. We have elected to use this extended transition period to enable us to comply with new or revised accounting standards that have different effective dates for public and private companies until the earlier of the date we (i) are no longer an emerging growth company or (ii) affirmatively and irrevocably opt out of the extended transition period provided in the JOBS Act. As a result, our consolidated financial statements may not be comparable to companies that comply with new or revised accounting pronouncements as of public company effective dates. We also intend to rely on other exemptions provided by the JOBS Act, including without limitation, not being required to comply with the auditor attestation requirements of Section 404.

We will remain an emerging growth company until the earliest of (i) the last day of the fiscal year following the fifth anniversary of the consummation of our initial public offering, (ii) the last day of the fiscal year in which we have total annual gross revenue of at least $1.07 billion, (iii) the last day of the fiscal year in which we are deemed to be a "large accelerated filer" as defined in Rule 12b-2 under the Exchange Act, or (iv) the date on which we have issued more than $1.0 billion in non-convertible debt securities during the prior three-year period.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk

We are exposed to market risks in the ordinary course of our business. Our primary risks include interest rate sensitivities.

Interest Rate Risk

We had cash equivalents of $270.2 million as of December 31, 2021, which consisted of money market funds and highly liquid investments purchased with original maturities of three months or less from the purchase date. We also had marketable securities of $604.5 million as of December 31, 2021. The primary objective of our investment activities is to preserve capital to fund our operations. Because our marketable securities are primarily short-term in duration, we believe that our exposure to interest rate risk is not significant, and a hypothetical 10% relative change in interest rates during any of the periods presented would not have had a material effect on our audited consolidated financial statements included in Part II, Item 8 of this Annual Report on Form 10-K. We had no debt outstanding as of December 31, 2021.

Foreign Currency Exchange Risk

All of our employees and operations are currently located in the United States and our expenses are generally denominated in U.S. dollars. We therefore are not currently exposed to significant market risk related to changes in foreign currency exchange rates. However, we have contracted with and may continue to contract with non-U.S. vendors who we may pay in their local currency. Our operations may be subject to fluctuations in foreign currency exchange rates in the future. To date, foreign currency transaction gains and losses have not been material to our consolidated financial statements, and we have not had a formal hedging program with respect to foreign currency. We believe a hypothetical 1% change in exchange rates during any of the periods presented would not have a material effect on our consolidated financial statements included in Part II, Item 8 of this Annual Report on Form 10-K.

Effects of Inflation

Inflation generally affects us by increasing our cost of labor and in the future our clinical trial costs. We believe that inflation has not had a material effect on our audited consolidated financial statements included in Part II, Item 8 of this Annual Report on Form 10-K.

Item 8. Financial Statements and Supplementary Data

LYELL IMMUNOPHARMA, INC.
INDEX TO CONSOLIDATED FINANCIAL STATEMENTS
Years ended December 31, 2021, 2020 and 2019

CONTENTS

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Stockholders and the Board of Directors of Lyell Immunopharma, Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Lyell Immunopharma, Inc. (the Company) as of December 31, 2021 and 2020, the related consolidated statements of operations and comprehensive loss, convertible preferred stock and stockholders' equity (deficit) and cash flows for each of the three years in the period ended December 31, 2021, and the related notes (collectively referred to as the "consolidated financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company at December 31, 2021 and 2020, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2021, in conformity with U.S. generally accepted accounting principles.

Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. The Company is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. As part of our audits we are required to obtain an understanding of internal control over financial reporting but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control over financial reporting. Accordingly, we express no such opinion.

Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/ Ernst & Young LLP

We have served as the Company's auditor since 2019.

Redwood City, California
March 29, 2022

Lvell Immunopharma, Inc.
Consolidated Balance Sheets
(in thousands, except per share amounts)

	As of December 31,	
	2021	2020
ASSETS		
Current assets:		
Cash and cash equivalents	$ 293,828	$ 140,406
Marketable securities	320,966	472,213
Prepaid expenses and other current assets	11,492	4,928
Total current assets	626,286	617,547
Restricted cash	466	466
Marketable securities, non-current	283,531	79,995
Other investments	47,001	83,448
Property and equipment, net	120,098	77,045
Operating lease right-of-use assets	46,541	47,010
Other non-current assets	3,483	2,769
Total assets	$ 1,127,406	$ 908,280
LIABILITIES, CONVERTIBLE PREFERRED STOCK AND STOCKHOLDERS' EQUITY (DEFICIT)		
Current liabilities:		
Accounts payable	$ 3,207	$ 9,396
Accrued liabilities and other current liabilities	29,057	28,021
Success payment liabilities	9,486	5,773
Deferred revenue	4,988	6,095
Total current liabilities	46,738	49,285
Operating lease liabilities, non-current	66,650	50,957
Deferred revenue, non-current	79,665	89,066
Other non-current liabilities	4,566	532
Total liabilities	197,619	189,840
Commitments and contingencies (Note 16)		
Convertible preferred stock, $0.0001 par value; zero and 195,021 shares authorized at December 31, 2021 and 2020, respectively; zero and 194,474 shares issued and outstanding at December 31, 2021 and 2020, respectively	—	1,010,968
Stockholders' equity (deficit):		
Preferred stock, $0.0001 par value; 10,000 and zero shares authorized at December 31, 2021 and 2020, respectively; zero shares issued and outstanding at December 31, 2021 and 2020	—	—
Common stock, $0.0001 par value; 500,000 and 264,905 shares authorized at December 31, 2021 and 2020, respectively; 242,738 and 15,570 shares issued and outstanding at December 31, 2021 and 2020, respectively	24	2
Additional paid-in capital	1,515,748	41,357
Accumulated other comprehensive (loss) income	(1,623)	256
Accumulated deficit	(584,362)	(334,143)
Total stockholders' equity (deficit)	929,787	(292,528)
Total liabilities, convertible preferred stock and stockholders' equity (deficit)	$ 1,127,406	$ 908,280

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

Lvell Immunopharma, Inc.
Consolidated Statements of Operations and Comprehensive Loss
(in thousands, except per share amounts)

	Year Ended December 31,		
	2021	2020	2019
Revenue	$ 10,650	$ 7,756	$ 657
Operating expenses (income):			
Research and development	138,693	182,243	63,595
General and administrative	89,057	46,881	39,151
Other operating income, net	(2,324)	(9,431)	—
Total operating expenses	225,426	219,693	102,746
Loss from operations	(214,776)	(211,937)	(102,089)
Interest income, net	1,165	5,939	8,121
Other (expense) income, net	(161)	1,526	(35,409)
Impairment of other investments	(36,447)	—	—
Total other (loss) income, net	(35,443)	7,465	(27,288)
Net loss	(250,219)	(204,472)	(129,377)
Other comprehensive (loss) gain:			
Net unrealized (loss) gain on marketable securities	(1,879)	(198)	454
Comprehensive loss	$ (252,098)	$ (204,670)	$ (128,923)
Net loss attributed to common stockholders:			
Net loss	$ (250,219)	$ (204,472)	$ (129,377)
Deemed dividends upon issuance or repurchase of convertible preferred stock	—	(3,582)	(1,144)
Net loss attributed to common stockholders	$ (250,219)	$ (208,054)	$ (130,521)
Net loss per common share, basic and diluted	$ (1.84)	$ (15.69)	$ (24.04)
Weighted-average shares used to compute net loss per common share, basic and diluted	135,918	13,258	5,429

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

Lvell Immunopharma, Inc.
Consolidated Statements of Convertible Preferred Stock and Stockholders' Equity (Deficit)
(in thousands)

	Convertible Preferred Stock		Common Stock		Additional Paid-in Capital	Accumulated Other Comprehensive (Loss) Income	Retained Earnings (Accumulated Deficit)	Total Stockholders' Equity (Deficit)
	Shares	Amount	Shares	Amount				
Balance as of December 31, 2018	74,406	$ 120,296	1,092	$ —	$ 826	$ —	$ 24	$ 850
Issuance of Series A convertible preferred stock, net of $29 in issuance costs	23,527	89,380	—	—	—	—	—	—
Issuance of Series B convertible preferred stock, net of $133 in issuance costs	23,930	162,018	—	—	—	—	—	—
Issuance of Series AA convertible preferred stock, net of $101 in issuance costs	30,253	146,325	—	—	—	—	—	—
Deemed dividends on issuance of Series A convertible preferred stock	—	1,144	—	—	(826)	—	(318)	(1,144)
Issuance of common stock to strategic partners	—	—	910	—	2,562	—	—	2,562
Repurchase of common stock	—	—	—	—	(185)	—	—	(185)
Stock-based compensation	—	—	9,179	1	15,731	—	—	15,732
Other comprehensive income	—	—	—	—	—	454	—	454
Net loss	—	—	—	—	—	—	(129,377)	(129,377)
Balance as of December 31, 2019	152,116	$ 519,163	11,181	$ 1	$ 18,108	$ 454	$ (129,671)	$ (111,108)
Issuance of Series C convertible preferred stock, net of $533 in issuance costs	42,905	492,467	—	—	—	—	—	—
Issuance of common stock to strategic partners	—	—	275	—	1,004	—	—	1,004
Issuance of common stock for asset acquisition	—	—	688	—	4,000	—	—	4,000
Issuance of common stock upon exercise of stock options	—	—	113	—	373	—	—	373
Stock-based compensation	—	—	5,345	1	33,260	—	—	33,261
Repurchase of convertible preferred stock	(547)	(662)	—	—	(3,582)	—	—	(3,582)
Repurchase of common stock	—	—	(2,032)	—	(11,806)	—	—	(11,806)
Other comprehensive loss	—	—	—	—	—	(198)	—	(198)
Net loss	—	—	—	—	—	—	(204,472)	(204,472)
Balance as of December 31, 2020	194,474	$ 1,010,968	15,570	$ 2	$ 41,357	$ 256	$ (334,143)	$ (292,528)
Proceeds from initial public offering, net of $33,198 in issuance costs	—	—	25,000	2	391,800	—	—	391,802
Conversion of convertible preferred stock to common stock	(194,474)	(1,010,968)	194,474	20	1,010,948	—	—	1,010,968
Issuance of common stock upon exercise of stock options	—	—	2,750	—	9,442	—	—	9,442
Stock-based compensation	—	—	4,944	—	62,201	—	—	62,201
Other comprehensive loss	—	—	—	—	—	(1,879)	—	(1,879)
Net loss	—	—	—	—	—	—	(250,219)	(250,219)
Balance as of December 31, 2021	—	$ —	242,738	$ 24	$ 1,515,748	$ (1,623)	$ (584,362)	$ 929,787

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

Lvell Immunopharma, Inc.
Consolidated Statements of Cash Flows
(in thousands)

	Year Ended December 31,		
	2021	**2020**	**2019**
CASH FLOWS FROM OPERATING ACTIVITIES			
Net loss	$ (250,219)	$ (204,472)	$ (129,377)
Adjustments to reconcile net loss to net cash (used in) provided by operating activities:			
Stock-based compensation expense	62,201	33,261	15,732
Impairment of other investments	36,447	—	—
Depreciation and amortization	13,624	4,294	1,256
Change in fair value of success payment liabilities	3,713	5,337	436
Change in fair value of warrants	256	(1,323)	—
Lease expense, net of gain on lease remeasurement	911	3,181	3,127
Non-cash expense in connection with asset acquisition	—	3,529	—
Net amortization or accretion on marketable securities	1,901	539	(1,518)
Loss on remeasurement of convertible preferred stock tranche liabilities	—	—	35,444
Expense in connection with equity issuances	—	—	3,566
Loss (gain) on property and equipment disposals	1,210	(4,884)	—
Gain on net operating lease liability disposal	(308)	—	—
Changes in operating assets and liabilities:			
Prepaid expenses and other assets	(6,987)	(1,388)	(5,767)
Accounts payable	91	(278)	1,709
Accrued liabilities and other current liabilities	4,542	6,120	9,755
Deferred revenue	(10,508)	(7,756)	102,917
Operating lease liabilities, non-current	13,202	2,966	2,194
Other non-current liabilities	3,675	—	—
Net cash (used in) provided by operating activities	(126,249)	(160,874)	39,474
CASH FLOWS FROM INVESTING ACTIVITIES			
Purchases of property and equipment	(65,504)	(51,481)	(16,047)
Purchases of marketable securities	(673,465)	(864,909)	(610,842)
Sales and maturities of marketable securities	617,396	686,322	238,456
Purchases of other investments	—	(43,448)	(34,000)
Net cash used in investing activities	(121,573)	(273,516)	(422,433)
CASH FLOWS FROM FINANCING ACTIVITIES			
Proceeds from initial public offering, net of issuance costs	391,802	—	—
Proceeds from issuance of convertible preferred stock, net of issuance costs	—	492,467	351,341
Proceeds from exercise of stock options	9,442	373	—
Payments for the repurchase of common stock	—	(11,806)	(185)
Payments for the repurchase of convertible preferred stock	—	(4,244)	—
Net cash provided by financing activities	401,244	476,790	351,156
Net increase (decrease) in cash, cash equivalents and restricted cash	153,422	42,400	(31,803)
Cash, cash equivalents and restricted cash at beginning of period	140,872	98,472	130,275
Cash, cash equivalents and restricted cash at end of period	$ 294,294	$ 140,872	$ 98,472
Represented by:			
Cash and cash equivalents	$ 293,828	$ 140,406	$ 96,674
Restricted cash	466	466	1,798
Total	$ 294,294	$ 140,872	$ 98,472
SUPPLEMENTAL CASH FLOW INFORMATION			
Cash received for amounts related to tenant improvement allowances	$ 13,295	$ 2,966	$ 2,194
Cash paid for amounts included in the measurement of lease liabilities	$ 8,546	$ 5,147	$ 1,464
Non-cash investing and financing activities:			
Conversion of convertible preferred stock to common stock upon closing of initial public offering	$ 1,010,968	$ —	$ —
Purchases of property and equipment included in accounts payable and accrued liabilities	$ 4,605	$ 12,740	$ 3,185
Operating lease right-of-use assets obtained in exchange for lease obligations	$ —	$ 30,475	$ 23,656
Remeasurement of operating lease right-of-use asset for lease modification	$ 3,873	$ (8,958)	$ —
Other investments received for sale of assets	$ —	$ 6,000	$ —
Non-cash deemed dividends on convertible preferred stock	$ —	$ —	$ 1,144

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

Lyell Immunopharma, Inc.
Notes to Consolidated Financial Statements

1. Organization

Lyell Immunopharma, Inc. (the "Company") was incorporated in Delaware in June 2018. The Company is a T-cell reprogramming company dedicated to the mastery of T cells to cure patients with solid tumors. The Company is building a multi-modality product pipeline. The Company's primary activities since incorporation have been to develop T-cell therapies, perform research and development, enter into strategic collaboration and license arrangements, enable manufacturing activities in support of its product candidate development efforts, acquire technology, organize and staff the Company, conduct business planning, establish its intellectual property portfolio, raise capital and provide general and administrative support for these activities.

Initial Public Offering

In June 2021, the Company successfully completed its initial public offering ("IPO") of its common stock. In connection with its IPO, the Company issued and sold 25,000,000 shares of common stock at an IPO price of $17.00 per share. The Company received $391.8 million in net proceeds, after deducting underwriting discounts and commissions of $29.8 million and offering expenses of $3.4 million. Upon the closing of the IPO, 194,474,431 shares of convertible preferred stock then outstanding converted into an equivalent number of shares of common stock. The related carrying value of the converted preferred stock of $1.0 billion was reclassified to common stock and additional paid in-capital.

2. Basis of Presentation and Significant Accounting Policies

Basis of Presentation

The accompanying consolidated financial statements have been prepared in accordance with U.S. generally accepted accounting principles ("GAAP"). The consolidated financial statements include the accounts of Lyell Immunopharma, Inc. and its wholly-owned subsidiary. All significant intercompany transactions and balances are eliminated in consolidation. Certain prior period amounts in the consolidated financial statements and accompanying notes have been reclassified to conform to the current period's presentation.

Liquidity and Management's Plan

The Company is currently working on a number of long-term development projects that involve experimental technologies. The projects may require several years and substantial expenditures to complete and ultimately may be unsuccessful. The Company plans to finance operations with available cash resources or from the issuance of equity or debt securities. The Company believes that its available cash, cash equivalents and marketable securities as of December 31, 2021 will be adequate to fund its operations at least through the next 12 months from the date these consolidated financial statements are issued. The Company will require substantial additional financial resources to complete the development and commercialization of its product candidates. Additional capital may not be available on terms acceptable to the Company, or at all. If adequate funds are not available, or if the terms of potential funding sources are unfavorable, the Company's business and ability to develop its technology and therapeutic products would be harmed. Furthermore, any sales of additional equity securities may result in dilution to the Company's stockholders, and any debt financing may include covenants that restrict the Company's business.

Summary of Significant Accounting Policies

Use of Estimates

The preparation of the Company's consolidated financial statements in conformity with GAAP requires management to make judgments, estimates and assumptions that affect reported amounts and related disclosures. Specific accounts that require management estimates include, but are not limited to, stock-based compensation, valuation of success payments, revenue recognition and accrued expenses. Management bases its estimates on historical experience and on various other assumptions that are believed to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying value of assets and liabilities that are not readily apparent from other sources. Actual results could differ materially from those estimates.

Comprehensive Loss

Comprehensive loss includes net loss and certain changes in stockholders' equity (deficit) that are excluded from net loss. For the years ended December 31, 2021, 2020, and 2019 this was comprised of net unrealized gains and losses on the Company's marketable securities.

Cash, Cash Equivalents and Restricted Cash

The Company considers all highly liquid investments purchased with original maturities of three months or less from the purchase date to be cash equivalents. Cash equivalents consist primarily of amounts invested in money market accounts.

Restricted cash is cash held in bank accounts and is used as collateral for letters of credits issued in conjunction with the Company's lease agreements and collateral associated with the Company's corporate credit card program.

Marketable Securities

The Company generally invests its excess cash in investment grade short- to intermediate-term fixed income securities. Such investments are classified as available-for-sale and are carried at fair value, with the unrealized gains and losses reported as a component of comprehensive loss. Realized gains and losses on available-for-sale securities are included in other (expense) income, net. The cost of investments sold is based on the specific-identification method. The Company classifies those investments that are not required for use in current operations and that mature in more than 12 months as non-current marketable securities in the accompanying consolidated balance sheets.

Each reporting period, the Company evaluates whether declines in fair value below carrying value are due to expected credit losses, as well as the Company's ability and intent to hold the investment until a forecasted recovery occurs. Expected credit losses are recorded as an allowance through other (expense) income, net.

Other Investments

The Company determines at the inception of each arrangement whether an investment or other interest is considered a variable interest entity ("VIE"). If the investment or other interest is determined to be a VIE, the Company evaluates whether it is considered the primary beneficiary. The primary beneficiary of a VIE is the party that meets both of the following criteria: (i) has the power to direct the activities that most significantly impact the VIE's economic performance; and (ii) has the obligation to absorb losses or the right to receive benefits from the VIE. For investments in VIEs in which the Company is considered the primary beneficiary, the assets, liabilities and results of operations of the VIE are included in its consolidated financial statements. As of December 31, 2021 and 2020, there were no VIEs for which the Company was the primary beneficiary.

The Company accounts for its strategic equity interests in non-publicly traded companies for which it does not have the ability to exercise significant influence in accordance with Accounting Standards Codification ("ASC") 321, *Investments – Equity Securities* ("ASC 321"). Upon acquisition, these investments are measured at cost, which represents the then fair value. Under ASC 321, the Company can elect to subsequently measure the investments at initial cost, minus impairment and any changes, plus or minus, resulting from observable price changes in orderly transactions for the identical or a similar investment of the same issuer. This election must be made for each investment separately. The Company has made this election for all investments in this category and will continue to measure these investments using this method until they no longer qualify to be measured in accordance with this method. Changes in the carrying value of other investments are recognized through net loss. Each reporting period, the Company performs a qualitative assessment to evaluate whether the investment is impaired. The Company's assessment includes a review of recent operating results and trends, recent sales/acquisitions of the investee securities and other factors that raise concerns about the investee's ability to continue as a going concern. If the investment is impaired, an impairment charge is recognized in the amount by which the carrying amount of the investment exceeds the estimated fair value of the investment, with the impairment charge recognized through net loss. See Note 5, *Other Investments*, for details related to an investment impairment recognized during the year ended December 31, 2021.

Additionally, the Company holds an investment in equity warrants giving it the right to acquire stock of a non-publicly traded company. Equity warrant investments are recorded within other assets at the estimated fair value, with gains and losses recognized in other (expense) income, net.

Property and Equipment, Net

Property and equipment primarily consist of laboratory equipment, computer equipment and software, furniture and fixtures and leasehold improvements. Property and equipment are stated at cost less accumulated depreciation and amortization. Depreciation is calculated using the straight-line method based on the estimated useful lives of the related assets, which are generally three to five years. For leasehold improvements, amortization is calculated using the straight-line method based on the shorter of the useful life or the lease term. When assets are retired or otherwise disposed of, the cost and related accumulated depreciation and amortization are removed from the balance sheet and the resulting gain or loss is recorded in other (expense) income, net in the period realized. Maintenance and repairs are expensed as incurred. The Company reviews its property and equipment for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset may not be recoverable.

Valuation of Long-lived Assets

Long-lived assets are reviewed each reporting period for impairment or whenever events or changes in circumstances indicate that the carrying amount of an asset may not be recoverable, which may warrant adjustments to carrying values or estimated useful lives. Recoverability is measured by comparison of the carrying amount of an asset group to the future net undiscounted cash flows that the assets are expected to generate. If the carrying amount of an asset group exceeds its estimated future cash flows, an impairment charge is recognized in the amount by which the carrying amount of the asset group exceeds the fair value of the asset group. If such assets are considered to be impaired, the impairment to be recognized is measured by the amount by which the carrying amount of the assets exceeds the projected discounted future net cash flows arising from the asset. There has been no impairment of long-lived assets for any of the periods presented.

Acquisitions

The Company evaluates acquisitions of assets and other similar transactions to assess whether or not the transaction should be accounted for as a business combination or asset acquisition by first applying a screen to determine if substantially all of the fair value of the gross assets acquired is concentrated in a single identifiable asset or group of similar identifiable assets. If the screen is met, the transaction is accounted for as an asset acquisition. If the screen is not met, further determination is required as to whether or not the Company has acquired inputs and processes that have the ability to create outputs which would meet the requirements of a business in which case the transaction is accounted for using the acquisition method of accounting, which requires, among other things, that assets acquired and liabilities assumed be recognized at their estimated fair values as of the acquisition date, and that the fair value of acquired intangibles be recorded on the balance sheet. Transaction costs are expensed as incurred. Any excess of the purchase price over the assigned fair values of the net assets acquired is recorded as goodwill. If the Company determines an acquisition does not meet the definition of a business combination under the acquisition method of accounting, the transaction is accounted for as an asset acquisition.

In an asset acquisition, upfront payments allocated to in-process research and development (“IPR&D”) are recorded in research and development expense if it is determined that there is no alternative future use, and subsequent milestone payments are recorded in research and development expense when achieved for technology that has not yet met product feasibility.

Leases

The Company leases certain office, laboratory and manufacturing spaces. In addition to minimum rent, the leases require payment of real estate taxes, insurance, common area maintenance charges and other executory costs. At inception of a contract, the Company determines whether an arrangement is or contains a lease based on the unique facts and circumstances present in the arrangement. For all leases, the Company determines the classification of the lease as either operating or financing. As of December 31, 2021 and 2020, all of the Company’s leases were classified as operating leases.

The Company recognizes right-of-use (“ROU”) assets and lease liabilities at the lease commencement date based on the present value of future lease payments over the lease term. As the Company’s leases do not provide an implicit rate, an incremental borrowing rate at each lease commencement date is used to determine the present value of future lease payments. The incremental borrowing rate is the rate of interest that the Company would pay to borrow equivalent funds on a collateralized basis at the lease commencement date. To estimate the incremental borrowing rate, a credit rating applicable to the Company is estimated using a synthetic credit rating analysis since the Company does not currently have a rating agency-based credit rating. The ROU asset includes any lease payments made prior to the lease commencement date

and is reduced by any lease incentives received or deemed payable to the Company. The lease term may include options to extend or terminate the lease when it is reasonably certain that a lease option will be exercised. Lease expense is recognized on a straight-line basis over the lease term within operating expenses on the consolidated statements of operations and comprehensive loss.

The Company has elected the practical expedient to not separate lease and non-lease components for real estate leases. Additionally, the Company has elected the short-term lease recognition exemption for all short-term leases and as a result, lease liabilities and ROU assets are not included on the consolidated balance sheets for leases with an initial term of 12 months or less.

Fair Value Measurements

The Company is required to disclose information on all assets and liabilities reported at fair value that enables an assessment of the inputs used in determining the reported fair values. The fair value hierarchy prioritizes valuation inputs based on the observable nature of those inputs. The fair value hierarchy applies only to the valuation inputs used in determining the reported fair value of the investments and is not a measure of the investment credit quality. The hierarchy defines three levels of valuation inputs:

Level 1 – Quoted prices in active markets for identical assets or liabilities.

Level 2 – Inputs other than quoted prices included within Level 1 that are observable for the asset or liability, either directly or indirectly.

Level 3 – Unobservable inputs that reflect the Company's own assumptions about the assumptions market participants would use in pricing the asset or liability.

The Company's financial instruments, in addition to those presented in Note 6, *Fair Value Measurements*, include cash, restricted cash, other investments, accounts payable and accrued liabilities and other current liabilities. The carrying amount of cash, restricted cash, accounts payable and accrued liabilities and other current liabilities approximate fair value because of the short-term nature of these instruments. As described in Note 5, *Other Investments*, other investments are carried at cost, minus impairment and any changes, plus or minus, resulting from observable price changes in orderly transactions for the identical or a similar investment of the same issuer.

Deemed Dividends Upon Issuance or Repurchase of Convertible Preferred Stock

In March 2020, 546,806 shares of the Company's Series A convertible preferred stock were repurchased by the Company at the then estimated fair value of $7.76 per share, which was higher than the carrying value of those shares. See Note 10, *Convertible Preferred Stock*. As a result, the Company recorded deemed dividends of $3.6 million for the year ended December 31, 2020. The transaction decreased convertible preferred stock by $0.7 million and reduced additional paid-in capital by $3.6 million. The deemed dividends increased the net loss attributed to common stockholders by $3.6 million.

Revenue Recognition

The Company recognizes revenue when its customer obtains control of promised goods or services, in an amount that reflects the consideration that the Company expects to receive in exchange for those goods or services. To determine revenue recognition for arrangements within the scope of ASC 606, *Revenue from Contracts with Customers*, ("ASC 606") the Company performs the following five steps: (i) identify the contract(s) with a customer; (ii) identify the performance obligations in the contract; (iii) determine the transaction price; (iv) allocate the transaction price to the performance obligations in the contract; and (v) recognize revenue when (or as) the performance obligation is satisfied.

In applying the ASC 606 framework, the Company must apply judgment to determine the nature of the promises within a revenue contract and whether those promises represent distinct performance obligations. In determining the transaction price, the Company does not include amounts subject to uncertainties unless it is probable that there will be no significant reversal of cumulative revenue when the uncertainty is resolved. Milestone and other forms of variable consideration that the Company may earn are subject to significant uncertainties of research and development related achievements, which generally are deemed not probable until such milestones are actually achieved. For arrangements that include sales-based royalties, including milestone payments based on the level of sales, and the license is deemed to be the predominant item to which the royalties relate, the Company recognizes revenue at the later of (i) when the related sales occur, or (ii) when the performance obligation to which some or all of the royalty has been allocated has been satisfied (or partially satisfied). Additionally, the Company develops assumptions that require judgment to determine the standalone

selling price of each performance obligation identified in the contract. The Company then allocates the total transaction price to each performance obligation based on the estimated standalone selling prices of each performance obligation, for which it recognizes revenue as or when the performance obligations are satisfied. At the end of each subsequent reporting period, the Company re-evaluates the variable consideration and any related constraint and, if necessary, adjusts its estimate of the overall transaction price. Any such adjustments are recorded on a cumulative catch-up basis.

Under the Company's license agreements, the Company grants the license to a customer as it exists at the point of transfer and the nature of the license is a right to use the Company's intellectual property as transferred. If the license to the Company's intellectual property is determined to be distinct from the other performance obligations identified in the arrangement, the Company recognizes revenue from non-refundable, upfront fees allocated to the license when the license is transferred to the customer and the customer is able to use and benefit from the license. For licenses that are bundled with other promises, the Company utilizes judgment to assess the nature of the combined performance obligation to determine whether the combined performance obligation is satisfied over time or at a point in time.

Research and Development Expense

The Company records expense for research and development costs as incurred. Research and development expenses consist of costs incurred by the Company for the discovery and development of its technology platforms and product candidates and includes costs incurred in connection with strategic collaborations, costs to license technology, personnel-related costs, including stock-based compensation expense, facility and technology related costs, research and laboratory expenses, as well as other expenses, which include consulting fees and other costs. Upfront payments and milestones paid to third parties in connection with technology platforms, which have not reached technological feasibility and do not have an alternative future use are expensed as incurred.

General and Administrative Expense

General and administrative costs are expensed as incurred and include personnel-related expenses, including stock-based compensation expense for personnel in executive, legal, finance and other administrative functions, legal costs, transaction costs related to collaboration and licensing agreements, as well as fees paid for accounting and tax services, consulting fees and facilities costs not otherwise included in research and development expenses. Legal costs include those related to corporate and patent matters.

Success Payments

The Company granted rights to success payments to Fred Hutchinson Cancer Research Center ("Fred Hutch") and The Board of Trustees of the Leland Stanford Junior University ("Stanford") pursuant to the terms of its research and collaboration agreements with each of those entities. Pursuant to the terms of these agreements, on each contractually prescribed measurement date, the Company may be required to make success payments based on increases in the estimated per share fair value of the Company's common stock. See Note 3, *Collaboration, License and Success Payment Agreements*. The success payments are accounted for under ASC 718, *Compensation – Stock Compensation*, with the expense being recorded in research and development expenses. Once the service period is complete, the instrument will be accounted for under ASC 815, *Derivatives and Hedging*, and continue to be remeasured each reporting period with all changes in value recognized immediately in other (expense) income, net.

The success payment liability is estimated at fair value at inception and at each reporting period, and the expense is accreted over the service period of the research and collaboration agreement. To determine the estimated fair value of the success payments, the Company uses a Monte Carlo simulation methodology which models the future movement of stock prices based on several key variables combined with empirical knowledge of the process governing the behavior of the stock price. The following variables were incorporated in the estimated fair value of the success payment liability: estimated fair value of the Company's common stock, expected volatility, risk-free interest rate and the estimated number and timing of valuation measurement dates on the basis of which payments may be triggered. The computation of expected volatility was estimated based on available information about the historical volatility of stocks of similar publicly traded companies for a period matching the expected term assumption.

Concentrations of Credit Risk and Off-balance Sheet Risk

The Company maintains its cash, cash equivalents and restricted cash with high quality, accredited financial institutions. These amounts, at times, may exceed federally insured limits. The Company also makes short-term investments in money market funds, U.S. Treasury securities, U.S. government agency securities and corporate debt

securities, which can be subject to certain credit risk. However, the Company mitigates the risks by investing in high-grade instruments, limiting exposure to any one issuer or type of investment and monitoring the ongoing creditworthiness of the financial institutions and issuers. The Company has not experienced any credit losses in such accounts and does not believe it is exposed to significant risk on these funds. The Company has no off-balance sheet concentrations of credit risk, such as foreign currency exchange contracts, option contracts or other hedging arrangements.

Claims and Contingencies

From time to time, the Company may become involved in litigation and proceedings relating to claims arising from the ordinary course of business. The Company accrues a liability if the likelihood of an adverse outcome is probable and the amount is estimable. If the likelihood of an adverse outcome is only reasonably possible (as opposed to probable), or if an estimate is not determinable, the Company provides disclosure of a material claim or contingency.

Stock-based Compensation

Under ASC 718, the Company measures and recognizes expense for restricted stock awards ("RSAs") and stock options granted to employees, directors and consultants based on the fair value of the awards on the date of grant. The fair value of stock options is estimated using the Black-Scholes option pricing model, which requires the use of subjective assumptions and for management to apply judgment and make estimates including: stock price volatility, the expected life of stock options, the risk-free interest rate, expected dividend, and the fair value of the underlying common stock on the date of grant.

The expected volatility is based on the historical volatility of the stock of similar entities within the Company's industry over periods commensurate with the Company's expected term assumption. The expected term of stock option grants represents the weighted-average period the options are expected to remain outstanding and is based on the "simplified" method where the expected term is the midpoint between the vesting date and the end of the contractual term for each option. The Company bases the risk-free interest rate on the interest rate payable on U.S. Treasury securities in effect at the time of grant for a period that is commensurate with the assumed expected option term. In reference to the expected dividend yield assumption, the Company has not historically paid, and does not expect for the foreseeable future to pay, a dividend.

The Company utilizes significant estimates and assumptions in determining the fair value of its common stock for financial reporting purposes. Prior to the closing of the IPO, the Company recorded expense for RSAs and stock options at prices not less than the fair market value of its common stock as determined by the board of directors, taking into consideration input from management and an independent third-party valuation analysis, and in accordance with the American Institute of Certified Public Accountants ("AICPA") Accounting and Valuation Guide, *Valuation of Privately-Held Company Equity Securities Issued as Compensation*. Following the closing of the IPO, the fair value of the Company's common stock is based on its closing price as reported on the NASDAQ Global Select Market on the date of grant.

Stock-based compensation expense for RSAs and stock options is recognized on a straight-line basis over the requisite service period, which is generally the vesting period of the respective award. The Company accounts for forfeitures as they occur.

The Company also granted stock options that vest in conjunction with certain performance conditions to certain key employees. At each reporting date, the Company is required to evaluate whether achievement of the performance conditions is probable. Compensation expense is recorded over the appropriate service period based upon the Company's assessment of accomplishing each performance provision.

Income Taxes

The Company determines its deferred tax assets and liabilities based on the differences between the financial reporting and tax basis of assets and liabilities. The deferred tax assets and liabilities are measured using the enacted tax rates that will be in effect when the differences are expected to reverse. A valuation allowance is recorded when it is more likely than not that the deferred tax asset will not be recovered. The Company applies judgment in the determination of the financial statement recognition and measurement of a tax position taken or expected to be taken in a tax return. The Company recognizes any material interest and penalties related to unrecognized tax benefits in income tax expense.

Segments

Operating segments are identified as components of an enterprise about which separate discrete financial information is available for evaluation by the chief operating decision-maker in making decisions regarding resource allocation and assessing performance. The Company views its operations and manages its business in one operating segment and one reportable segment.

Recent Accounting Pronouncements

Recently Adopted

Income Taxes

In December 2019, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Update ("ASU") No. 2019-12, *Income Taxes – Simplifying the Accounting for Income Taxes* ("ASU 2019-12"). The guidance removes exceptions to the general principles in Income Taxes (Topic 740) for allocating tax expense between financial statement components, accounting basis differences stemming from an ownership change in foreign investments and interim period income tax accounting for year-to-date losses that exceed projected losses. The guidance became effective for annual reporting periods beginning after December 15, 2020 and interim periods within those fiscal years with early adoption permitted. Effective January 1, 2019, the Company early adopted ASU 2019-12. The adoption of this standard did not have a material impact on the Company's consolidated financial statements.

Credit Losses

In June 2016, the FASB issued ASU No. 2016-13, *Financial Instruments – Credit Losses (Topic 326)* ("ASU 2016-13"). ASU 2016-13 implements an impairment model, known as the current expected credit loss model, that is based on expected losses rather than incurred losses. Under the new guidance, an entity will recognize as an allowance its estimate of expected credit losses. On January 1, 2020, the Company early adopted this standard by using a modified retrospective approach. The adoption did not have a material impact on the Company's consolidated financial statements.

Collaborative Arrangements

In November 2018, the FASB issued ASU No. 2018-18, *Collaborative Arrangements (Topic 808): Clarifying the Interaction between Topic 808 and Topic 606* ("ASU 2018-18"), which clarifies that certain transactions between participants in a collaborative arrangement should be accounted for under ASC 606 when the counterparty is a customer. In addition, ASU 2018-18 precludes an entity from presenting consideration from a transaction in a collaborative arrangement as revenue from contracts with customers if the counterparty is not a customer for that transaction. On January 1, 2020, the Company early adopted this standard on a retrospective basis to the date of initial application of ASC 606. The adoption did not have a material impact on the Company's consolidated financial statements.

Cloud Computing Arrangements

In August 2018, the FASB issued ASU No. 2018-15, *Intangibles – Goodwill and Other – Internal-Use Software (Subtopic 350-40): Customer's Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement That Is a Service Contract* ("ASU 2018-15"), which aligns the requirements for capitalizing implementation costs incurred in a hosting arrangement that is a service contract with the requirements for capitalizing implementation costs incurred to develop or obtain internal-use software (and hosting arrangements that include an internal-use software license). The accounting for the service element of a hosting arrangement that is a service contract is not affected by the amendments in this update. On January 1, 2020, the Company early adopted this standard using the prospective method. The adoption did not have a material impact on the Company's consolidated financial statements.

3. Collaboration, License and Success Payment Agreements

Fred Hutch

License Agreement – In 2018, the Company entered into a license agreement with Fred Hutch that grants the Company an exclusive, worldwide, sublicensable license under certain patent rights, and a non-exclusive, worldwide, sublicensable license for certain technology, to research, develop, manufacture, improve and commercialize products and processes covered by such patent rights or incorporating such technology for all therapeutic uses for the treatment of human cancer.

The Company is also required to pay Fred Hutch annual license maintenance payments of $50,000 on the second anniversary of the effective date, and each anniversary of the effective date thereafter until the first commercial sale of a licensed product.

Collaboration – In 2018, the Company entered into a research and collaboration agreement with Fred Hutch ("Fred Hutch Collaboration Agreement"), focused on research and development of cancer immunotherapy products. The Company funded aggregate research performed by Fred Hutch of $12.0 million under the Fred Hutch Collaboration Agreement and the research is conducted in accordance with a research plan and budget approved by the parties. The Fred Hutch Collaboration Agreement has a six-year term. During the year-ended December 31, 2021, one of the research plans on which the success payment service term is based, was extended from January 31, 2022 to December 31, 2022. The Company incurred $4.2 million, $4.1 million and $3.7 million in expense in connection with the Fred Hutch Collaboration Agreement for the years ended December 31, 2021, 2020 and 2019, respectively.

Success Payments – In 2018, the Company granted Fred Hutch rights to certain success payments, pursuant to the terms of the Fred Hutch Collaboration Agreement. The potential payments for the Fred Hutch success payments are based on multiples of increased value ranging from 10x to 50x based on a comparison of the estimated per share fair value of the Series A convertible preferred stock, or any security into which such stock has been converted or for which it has been exchanged, relative to its original $1.83 per share issuance price. Upon the closing of the IPO, all shares of Series A convertible preferred stock then outstanding converted into an equivalent number of shares of common stock. The aggregate success payments to Fred Hutch are not to exceed $200.0 million, which would only occur upon a 50 times increase in value. Each threshold is associated with a success payment, ascending from $10.0 million at $18.29 per share to $200.0 million at $91.44 per share, payable if such threshold is reached during the measurement period. Any previous success payments made are credited against the success payment owed as of any valuation date, such that Fred Hutch does not receive multiple success payments in connection with the same threshold. The term of the success payment agreement ends on the earlier to occur of (i) the nine year anniversary of the date of the agreement and (ii) a change in control transaction.

The following table summarizes the aggregate potential success payments, which are payable to Fred Hutch in cash or cash equivalents, or at the Company's discretion, publicly-tradeable shares of the Company's common stock:

Multiple of initial equity value at issuance	10x	20x	30x	40x	50x
Per share common stock price required for payment	$ 18.29	$ 36.58	$ 54.86	$ 73.15	$ 91.44
Aggregate success payment(s) (in millions)	$ 10	$ 40	$ 90	$ 140	$ 200

The success payments will be owed if the per share fair value of the Company's common stock on the contractually specified valuation measurement dates during the term of the success payment agreement equals or exceeds the above outlined multiples. The valuation measurement dates are triggered by the following events: the one-year anniversary of the Company's IPO and each two-year anniversary of the Company's IPO thereafter, the closing of a change in control transaction and the last day of the term of the success payment agreement, unless the term has ended due to the closing of a change of control transaction.

The estimated fair values of the success payments to Fred Hutch as of December 31, 2021 and 2020 were $8.5 million and $8.0 million, respectively. The success payment liability is estimated at fair value at inception and at each subsequent reporting period and the expense is accreted over the service period of the Fred Hutch Collaboration Agreement. The success payment liability was $6.4 million and $5.2 million as of December 31, 2021 and 2020, respectively. With respect to Fred Hutch success payment obligations, the Company recognized expense of $1.2 million, $4.8 million, and $0.4 million for the years ended December 31, 2021, 2020, and 2019 respectively.

Stanford

License Agreement – In 2019, the Company entered into a license agreement with Stanford to license specified patent rights. The Company is also required to pay Stanford annual license maintenance payments of $50,000 on the second anniversary of the effective date, and each anniversary of the effective date thereafter until the date of the first commercial sale of a licensed product.

Milestone payments to Stanford of up to a maximum of $3.7 million per target are payable upon achievement of certain specified clinical and regulatory milestones. The Company is also obligated to pay Stanford $2.5 million collectively for all licensed products upon the achievement of a certain commercial milestone. Additionally, low single-digit tiered royalties based on annual net sales of the licensed products are payable to Stanford.

Collaboration Agreement – In October 2020, the Company entered into a research and collaboration agreement with Stanford ("Stanford Collaboration Agreement"), focused on research and development of cellular immunotherapy products. The Stanford Collaboration Agreement has a four-year term. The Company is committed to fund aggregate research performed by Stanford of $12.0 million under the Stanford Collaboration Agreement, and the research will be conducted in accordance with a research plan and budget approved by the parties. The Company incurred $3.0 million and $0.8 million in expense in connection with the Stanford Collaboration Agreement for the years ended December 31, 2021 and 2020, respectively.

Success Payments – In October 2020, the Company granted Stanford rights to certain success payments, pursuant to the terms of the Stanford Collaboration Agreement. The potential payments for the Stanford success payments are based on multiples of increased value ranging from 10x to 50x based on a comparison of the estimated per share fair value of the Series A convertible preferred stock, or any security into which such stock has been converted or for which it has been exchanged, relative to its original $1.83 per share issuance price. At the closing of the IPO, all shares of Series A convertible preferred stock then outstanding converted into an equivalent number of shares of common stock. The aggregate success payments to Stanford are not to exceed $200.0 million, which would only occur upon a 50 times increase in value. Each threshold is associated with a success payment, ascending from $10.0 million at $18.29 per share to $200.0 million at $91.44 per share, payable if such threshold is reached during the measurement period. Any previous success payments made are credited against the success payment owed as of any valuation date, so that Stanford does not receive multiple success payments in connection with the same threshold. The term of each success payment agreement ends on the earlier to occur of (i) the nine year anniversary of the date of the agreement and (ii) a change in control transaction.

The following table summarizes the aggregate potential success payments, which are payable to Stanford in cash or cash equivalents, or at the Company's discretion, publicly-tradeable shares of the Company's common stock:

Multiple of initial equity value at issuance	10x	20x	30x	40x	50x
Per share common stock price required for payment	$ 18.29	$ 36.58	$ 54.86	$ 73.15	$ 91.44
Aggregate success payment(s) (in millions)	$ 10	$ 40	$ 90	$ 140	$ 200

The success payments will be owed if the per share fair value of the Company's common stock on the contractually specified valuation measurement dates during the term of the success payment agreement equals or exceeds the above outlined multiples. The valuation measurement dates are triggered by the following events: the one-year anniversary of the Company's IPO and each two-year anniversary of the Company's IPO thereafter, the closing of a change in control transaction and the last day of the term of the success payment agreement, unless the term has ended due to the closing of a change of control transaction.

The estimated fair value of the success payments to Stanford as of December 31, 2021 and 2020 was $9.9 million and $8.9 million, respectively. The success payment liability is estimated at fair value at inception and at each subsequent reporting period and the expense is accreted over the service period of the Stanford Collaboration Agreement. The success payment liability was $3.1 million and $0.6 million as of December 31, 2021 and 2020, respectively. With respect to Stanford success payment obligations, the Company recognized expense of $2.5 million and $0.6 million for the years ended December 31, 2021 and 2020, respectively.

GSK

In 2019, the Company entered into a Collaboration and License Agreement, amended in June 2020 and December 2021 ("GSK Agreement") with GlaxoSmithKline Intellectual Property (No. 5) Limited and Glaxo Group Limited (together, "GSK") for potential T-cell therapies that apply the Company's platform technologies and cell therapy innovations with T-cell receptors ("TCRs") or chimeric antigen receptors ("CARs") under distinct collaboration programs. The GSK Agreement has defined two initial collaboration targets and allows GSK to nominate seven additional targets through July 2024. The Company is expected to perform research and development services for each selected target up until a defined point (the "GSK Option Point"), at which time GSK will decide whether or not to exercise an option to obtain a license from the Company ("License Option") and take over the future development and commercialization. For each selected target, both parties will determine whether it will be developed under a Proof of Concept ("PoC") Development Program or Component Development Program. For a PoC Development Program, the Company is expected to conduct both preclinical and clinical development for the target and present clinical trial data to GSK in connection with their evaluation of whether to exercise the License Option. For a Component Development Program, the Company is obligated to perform preclinical studies only. Along with the research activities, the Company appoints three

representatives to the joint steering committee ("JSC") and is responsible for the manufacture of all compounds and products necessary for its research and development activities.

The Company received a non-refundable upfront payment of $45.0 million under the GSK Agreement. In addition to the upfront payment, the Company is eligible to receive up to two one-time payments, totaling up to approximately $200.0 million in aggregate for technology validation of the Company's cell therapy innovations. For each cell therapy target for which there has been a joint collaboration program, the Company also could receive up to approximately $400.0 million in aggregate in development and sales milestones if the target is already within GSK's pipeline and meets certain criteria, up to approximately $900.0 million in aggregate in development and sales milestones for all other targets, and tiered royalties on a per-product basis ranging from low to high single digits for targets that are already within GSK's pipeline and meet certain criteria, or from high single digit to low teens for all other targets. Milestones are paid once per target, even if there is more than one of the Company's innovations applied to a T-cell therapy directed to that target. Any amounts received from GSK are generally non-refundable unless the Company terminates a collaboration target for safety or feasibility reasons and the funding received from GSK exceeds the costs incurred for the terminated target.

In connection with the GSK Agreement, in May 2019, the Company also entered into a Stock Purchase Agreement with GSK (the "GSK Stock Purchase Agreement"), pursuant to which the Company agreed to sell 30,253,189 shares of Series AA convertible preferred stock at a price of $6.78 per share, which was above the issuance date estimated fair value of $4.84 per share. The difference between the per share values resulted in $58.6 million additional deemed consideration, bringing the total upfront payment of the GSK Agreement to $103.6 million.

Research and Development Services

The GSK Agreement was deemed to be within the scope of ASC 606 because GSK engaged the Company to initially provide research and development services, which are outputs of its ongoing activities, in exchange for consideration.

The Company identified the following two distinct performance obligations: (i) research and development services related to the two initial collaboration targets, inclusive of the JSC participation and the manufacture of compounds necessary for providing the research and development services and (ii) a material right for GSK to nominate seven additional collaboration targets for which the Company will perform research and development services until the GSK Option Point.

To allocate revenue among the performance obligations, the Company determined standalone selling prices ("SSP") of each obligation. For the research and development services, the SSP was calculated using a cost-plus margin approach. For the material right, SSP was calculated by reference to the underlying research and development services expected to be provided and the corresponding expected consideration. All amounts included in the transaction price are allocated to performance obligations proportionate to their SSPs.

As of December 31, 2020, the transaction price was deemed to be $103.6 million, consisting of the upfront payment of $45.0 million under the GSK Agreement and the $58.6 million allocated from the GSK Stock Purchase Agreement. Other than the upfront payment and the amounts allocated from the GSK Stock Purchase Agreement, all other contingent consideration that may be earned under the GSK Agreement is subject to uncertainties including but not limited to target addition, research and investigational new drug enabling studies, initiation of clinical trials, and other related achievements. Consequently, the transaction price currently does not include any such contingent consideration that, if included, could result in a probable significant reversal of cumulative revenue when related uncertainties become resolved. The Company will re-evaluate the transaction price at each reporting period. If and when contingent consideration is included in the transaction price, it will be allocated to the two performance obligations proportionate to their SSPs and a cumulative catch up in revenue will be recorded for the portion of the services already completed. The remaining amounts will be deferred and recognized as the services are rendered.

The research and development services are transferred as the services are performed, with cost used as the measure of progress compared to total estimated cost to complete. Incurred cost represents work performed, which corresponds with, and thereby best depicts, the transfer of control to the customer. The determination of the percentage of completion requires the Company to estimate the costs to complete the project. The Company makes a detailed estimate of the costs to complete, which is reassessed every reporting period based on the latest project plan and discussions with project teams. If a change in facts or circumstances occurs, the estimate will be adjusted, and the revenue will be recognized based on the revised estimate. The difference between the cumulative revenue recognized based on the previous estimate and the revenue recognized based on the revised estimate would be recognized as an adjustment to revenue in the period in which the change in estimate occurs.

The Company recognized revenue related to the research and development services related to the two initial targets of $10.5 million, $7.8 million and $0.7 million for the years ended December 31, 2021, 2020 and 2019 respectively. Changes in deferred revenue during the year ended December 31, 2021 were as follows:

Deferred revenue balance at December 31, 2020	$	95,161
Revenue recognized during the period previously recorded in deferred revenue		(10,508)
Deferred revenue balance at December 31, 2021	$	84,653

Exercise of the License Option

In April 2021, GSK exercised the License Option on NY-ESO-1 TCR with Gen-R, a Component Development Program, and will assume sole responsibility for future development and commercialization of the program at its own cost and expense. The Company is entitled to the remaining development and sales milestones up to an aggregate of approximately $400.0 million as well as the tiered royalties on future sales of all such products covered by the license granted pursuant to the License Option.

The exercise of the License Option was accounted for as a separate license contract for revenue recognition purposes. The Company identified one performance obligation, which was the license delivered to GSK upon the exercise of the License Option and transfer of information and data associated with the license. The Company concluded that the development milestone payments are solely dependent on GSK's performance and achievement of the specified events and are deemed to be not probable until such development milestones are actually achieved. Therefore, the remaining development milestones are fully constrained and excluded from the transaction price until the respective milestone is achieved. The Company also concluded that sales milestones and royalties relate predominantly to the license granted to GSK. Therefore, they also have been excluded from the transaction price and will be recognized when the related sales occur. At the end of each reporting period, the Company will update its assessment of whether an estimate of variable consideration is constrained and update the estimated transaction price accordingly.

As of December 31, 2021, there were no contract assets or contract liabilities related to the license contract. None of the costs to obtain or fulfill the contract were capitalized. No license revenue was recognized for the year ended December 31, 2021.

PACT

In June 2020, the Company entered into an agreement ("PACT Agreement") with PACT Pharma, Inc. ("PACT") to jointly develop and test a next generation personalized anti-cancer T-cell therapy against solid tumors. The Company paid PACT an upfront non-refundable payment of $50.0 million upon execution of the PACT Agreement. In November 2020, the parties agreed to suspend research and development activity under the PACT Agreement, and neither party would be required to conduct any further work under the development plan (including manufacturing development) nor incur any financial obligations (including milestone payments) that might otherwise arise, for as long as the parties continued to negotiate in good faith to resolve the issues that have arisen between them relating to the PACT Agreement.

In June 2020 in connection with the entry into the PACT Agreement, the Company also entered into a stock purchase agreement with PACT ("PACT SPA"), pursuant to which the Company purchased 17,806,901 shares of PACT Series C-1 convertible preferred stock at a purchase price of $2.81 per share. As of the purchase date, the estimated fair value of the Series C-1 convertible preferred stock was $2.05 per share, and the difference between the estimated fair value of the preferred stock as of the purchase date and the purchase price of $13.6 million was deemed to be additional consideration for the PACT Agreement and recognized as research and development expense. As a result, the total upfront payment paid in connection with the PACT Agreement was $63.6 million and was included in research and development expense. The remaining $36.4 million associated with the PACT Series C-1 convertible preferred stock was recorded in other investments. In the fourth quarter of 2021, the Company fully impaired the remaining balance of $36.4 million. See Note 5, *Other Investments*, for additional details regarding the PACT investment impairment.

In February 2021, the Company filed a demand for arbitration seeking, among other things, rescission of the PACT Agreement and the PACT SPA and recovery of the consideration paid thereunder. An arbitration hearing occurred in March 2022. The Company expects to receive the outcome of the arbitration panel in June 2022.

NCI

In December 2020, the Company entered into a license agreement with the National Cancer Institute ("NCI") to access certain intellectual property for the development of treatment of human cancers. In connection with this agreement, the Company paid $100,000 upfront, which was recorded as research and development expense for the year ended December 31, 2020. The Company is also required to pay NCI annual maintenance payments which may be credited against earned royalties. The Company incurred $75,000 and $3,100 in maintenance fees for the years ended December 31, 2021 and 2020, respectively.

Under the agreement, the Company may also be required to make certain prespecified development milestone payments up to an aggregate of $3.1 million, and prespecified commercial milestone payments up to a maximum aggregate of $12.0 million for all licensed products. In June 2021, the Company entered into an amendment to the license agreement with NCI to include additional intellectual property and one additional inventor. In connection with this amendment, the Company paid $25,000 upfront, which was recorded in research and development expense. Under the amendment, the Company may also be required to pay prespecified additional development milestone payments that total $75,000.

4. Cash Equivalents and Marketable Securities

The fair value and amortized cost of cash equivalents and marketable securities by major security type as of December 31, 2021 and 2020 are presented in the following tables (in thousands):

	December 31, 2021			
	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value
Money market funds	$ 206,245	$ —	$ —	$ 206,245
U.S. Treasury securities	290,909	2	(1,205)	289,706
U.S. government agency securities	93,864	2	(240)	93,626
Corporate debt securities	285,338	—	(182)	285,156
Total cash equivalents and marketable securities	$ 876,356	$ 4	$ (1,627)	$ 874,733

Classified as:	Fair Value
Cash equivalents	$ 270,236
Marketable securities	320,966
Marketable securities, non-current	283,531
Total cash equivalents and marketable securities	$ 874,733

	December 31, 2020			
	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value
Money market funds	$ 50,513	$ —	$ —	$ 50,513
U.S. Treasury securities	202,674	27	—	202,701
U.S. government agency securities	205,558	207	(1)	205,764
Corporate debt securities	211,086	34	(11)	211,109
Total cash equivalents and marketable securities	$ 669,831	$ 268	$ (12)	$ 670,087

Classified as:	Fair Value
Cash equivalents	$ 117,879
Marketable securities	472,213
Marketable securities, non-current	79,995
Total cash equivalents and marketable securities	$ 670,087

As of December 31, 2021 and 2020, the fair value of securities held by the Company in an unrealized loss position was $602.9 million and $132.6 million, respectively, and as of December 31, 2021 and 2020, securities held by the Company in an unrealized loss position have been in the continuous loss position for less than 12 months. The Company determined that there was no material change in the credit risk of the above investments during the years ended December 31, 2021 and 2020. As such, an allowance for credit losses has not been recognized. The Company does not intend to sell these securities nor does the Company believe that it will be required to sell these securities before recovery of their amortized cost basis. Gross realized gains and losses were *de minimis* for the years ended December 31, 2021 and 2020 and as a result, amounts reclassified out of accumulated other comprehensive (loss) income for the years ended December 31, 2021 and 2020 were also *de minimis*.

As of December 31, 2021 and 2020, all of the Company's marketable securities had a maturity date of two years or less, were available for use, and were classified as available-for-sale. See Note 6, *Fair Value Measurements*, for additional information regarding cash equivalents and marketable securities.

5. Other Investments

From time to time, the Company makes minority ownership strategic investments. As of December 31, 2021 and 2020, the aggregate carrying amounts of the Company's strategic investments in non-publicly traded companies were $47.0 million and $83.4 million, respectively. These investments are measured at initial cost, minus impairment, if any, and plus or minus changes, resulting from observable price changes in orderly transactions for the identical or a similar investment of the same issuer.

In connection with the preparation of the financial statements for 2021, the Company performed a qualitative assessment of potential indicators of impairment and determined that indicators exist for its $36.4 million investment in PACT Series C-1 convertible preferred stock. While there was no single event or factor, the Company considered PACT's operating cash flow requirements over the next year and liquid asset balances to fund those requirements and PACT's inability to raise funds as indicators of impairment. Due to these indicators, the Company assessed the valuation of the investment in PACT as of December 31, 2021 and determined the fair value to be negligible and the impairment to be other-than-temporary in nature. As a result, the Company recorded a $36.4 million impairment expense for the PACT investment in the fourth quarter of 2021. The impairment charge was recorded within impairment of other investments on the Consolidated Statement of Operations and Comprehensive Loss and as a reduction to the investment balance within other investments on the Consolidated Balance Sheet. Aside from the investment in PACT, no other investments were impaired for the year ended December 31, 2021.

In November 2020, the Company made a strategic equity investment of $13.0 million in Outpace Bio, Inc. ("Outpace"), a privately-held company, which represented a minority ownership interest at the time of the strategic investment. Outpace is engaged in the research and development of protein and cell technology platforms and has financed its activities via issuances of preferred stock. The Company determined that Outpace is a VIE and the at-risk equity holders, as a group, lack the characteristics of a controlling financial interest. The Company does not have majority voting rights, representation on Outpace's board of directors or the power to direct the activities of this entity, and therefore it is not the primary beneficiary. As of both December 31, 2021 and 2020, the carrying value of the Company's investment in Outpace was $13.0 million, which is recorded in other investments.

6. Fair Value Measurements

The following table sets forth the fair value of the Company's financial assets and liabilities measured at fair value on a recurring basis based on the three-tier fair value hierarchy (in thousands):

	December 31, 2021			
	Level 1	Level 2	Level 3	Total
Financial assets:				
Money market funds	$ 206,245	$ —	$ —	$ 206,245
U.S. Treasury securities	—	289,706	—	289,706
U.S. government agency securities	—	93,626	—	93,626
Corporate debt securities	—	285,156	—	285,156
Equity warrant investment	—	—	1,067	1,067
Total financial assets	$ 206,245	$ 668,488	$ 1,067	$ 875,800
Financial liabilities:				
Success payment liabilities	$ —	$ —	$ 9,486	$ 9,486
Total financial liabilities	$ —	$ —	$ 9,486	$ 9,486

	December 31, 2020			
	Level 1	Level 2	Level 3	Total
Financial assets:				
Money market funds	$ 50,513	$ —	$ —	$ 50,513
U.S. Treasury securities	—	202,701	—	202,701
U.S. government agency securities	—	205,764	—	205,764
Corporate debt securities	—	211,109	—	211,109
Equity warrant investment	—	—	1,323	1,323
Total financial assets	$ 50,513	$ 619,574	$ 1,323	$ 671,410
Financial liabilities:				
Success payment liabilities	$ —	$ —	$ 5,773	$ 5,773
Total financial liabilities	$ —	$ —	$ 5,773	$ 5,773

The Company measures the fair value of money market funds based on quoted prices in active markets for identical assets or liabilities. The Level 2 marketable securities include U.S. Treasury securities, government agency securities and corporate debt securities. The Company's Level 2 securities are valued using third-party pricing sources. The pricing services utilize industry standard valuation models. Inputs utilized include market pricing based on real-time trade data for the same or similar securities and other significant inputs derived from or corroborated by observable market data.

The Level 3 financial instruments include an equity warrant investment and the success payment liabilities. The Company's Level 3 financial instruments are valued using valuation models which include the Black-Scholes model for valuing the equity warrant investment and a Monte Carlo simulation for the success payment liabilities. To determine the estimated fair value of the success payment liabilities, the Company uses a Monte Carlo simulation methodology that models the future movement of stock prices based on several key variables combined with empirical knowledge of the process governing the behavior of the stock price. The following variables were incorporated in the estimated fair value of the success payment liabilities: fair value of the Company's common stock (Series A convertible preferred stock, prior to IPO), expected volatility, risk-free interest rate and the estimated number and timing of valuation measurement dates on the basis of which payments may be triggered. The computation of expected volatility was estimated based on available information about the historical volatility of stocks of similar publicly traded companies for a period matching the expected term assumption.

The following assumptions were incorporated into the calculation of the estimated fair value of the Fred Hutch success payment liability:

	December 31,	
	2021	2020
Fair value of common stock (Series A convertible preferred stock)	$ 7.74	$ 9.07
Risk-free interest rate	0.19% - 1.88%	0.10% - 1.52%
Expected volatility	75 %	80 %
Expected term (in years)	0.46 - 5.97	1.00 - 6.97

The following assumptions were incorporated into the calculation of the estimated fair value of the Stanford success payment liability:

	December 31,	
	2021	2020
Fair value of common stock (Series A convertible preferred stock)	$ 7.74	$ 9.07
Risk-free interest rate	0.19% - 1.88%	0.10% - 1.53%
Expected volatility	75 %	80 %
Expected term (in years)	0.46 - 7.75	1.00 - 8.75

The Company utilizes estimates and assumptions in determining the estimated success payment liabilities and associated expense. A small change in the valuation of the Company's common stock may have a relatively large change in the estimated fair value of the success payment liability and associated expense.

The following table sets forth a summary of the changes in the fair value of the Company's Level 3 financial assets and liabilities (in thousands):

	Equity Warrant Investment	Success Payment Liabilities
Balance at December 31, 2019	$ —	$ 436
Additions	1,380	—
Change in fair value [(1)]	(57)	5,337
Balance at December 31, 2020	1,323	5,773
Change in fair value [(1)]	(256)	3,713
Balance at December 31, 2021	$ 1,067	$ 9,486

(1) The change in fair value associated with the equity warrant investment held is recorded in other (expense) income, net and the change in fair value associated with success payments liabilities is recorded in research and development expense.

7. Property and Equipment, Net

Property and equipment, net, consisted of the following (in thousands):

	December 31,	
	2021	2020
Leasehold improvements	$ 95,001	$ 8,452
Laboratory equipment	27,039	17,083
Computer equipment and software	1,610	724
Furniture and fixtures	384	178
Construction in progress	10,577	55,712
Property and equipment, at cost	134,611	82,149
Less: Accumulated depreciation and amortization	(14,513)	(5,104)
Total property and equipment, net	$ 120,098	$ 77,045

Depreciation and amortization expense was $13.5 million, $4.2 million and $1.3 million for the years ended December 31, 2021, 2020 and 2019, respectively.

8. Accrued Liabilities and Other Current Liabilities

Accrued liabilities and other current liabilities consisted of the following (in thousands):

	December 31,	
	2021	2020
Accrued compensation and related benefits	$ 17,296	$ 14,850
Accrued property and equipment	4,055	5,910
Accrued legal	2,619	412
Accrued research and development expenses	2,449	2,575
Current lease liabilities	1,169	3,617
Other	1,469	657
Total accrued liabilities and other current liabilities	$ 29,057	$ 28,021

9. Leases

The Company's lease portfolio is comprised of operating leases for laboratory, office and manufacturing facilities located in South San Francisco, California, and Seattle and Bothell, Washington with contractual periods expiring between December 2028 and March 2031. In addition to minimum rent, the leases require payment of real estate taxes, insurance, common area maintenance charges and other executory costs. These additional charges are considered variable costs and are recognized in the period in which the costs are incurred.

In 2018, the Company entered into an operating lease for approximately 34,000 square feet of office and laboratory space in Seattle, Washington, with an initial lease term expiring in December 2028. The Company has two five-year options to extend the lease, which are not reasonably assured.

In 2019, the Company entered into an operating lease for approximately 34,000 square feet of office and laboratory space in South San Francisco, California. In December 2020, the Company exercised its early termination right and remeasured the remaining consideration in the contract, resulting in a gain of $2.9 million, which was recognized in other operating income, net. The lease termination was effective October 2021, resulting in a gain of $0.3 million, which was recognized in other operating income, net. Additionally, the Company recognized a loss of $0.6 million at lease termination on leasehold improvements unable to be moved to its new corporate headquarters in South San Francisco, California, which was recognized in other operating income, net.

In 2019, the Company entered into two operating lease agreements for a combined approximately 73,000 square feet of space to develop a cell therapy manufacturing facility located in Bothell, Washington, with initial terms expiring in May 2030. The Company has two 90-month options to extend the leases, which are not reasonably assured.

In 2019, the Company entered into an operating lease agreement for approximately 108,000 square feet of office and laboratory space located in South San Francisco, California. The initial lease term expires in January 2031 with the option to extend the term for another 10 years, which is not reasonably assured. In January 2021, the Company amended the lease term to extend the lease expiration to March 2031, which resulted in an increase to the right of use asset and lease liability of $4.2 million.

The following table summarizes the Company's future minimum operating lease commitments, including expected lease incentives to be received, as of December 31, 2021 (in thousands):

Year Ending December 31:		
2022	$	9,807
2023		11,018
2024		11,347
2025		11,859
2026		12,209
Thereafter		48,094
Total undiscounted lease payments		104,334
Less: imputed interest		(31,754)
Less: tenant improvement allowances		(4,761)
Total operating lease liabilities	$	67,819
Reported as of December 31, 2021:		
Short-term portion of lease liabilities (included in accrued liabilities and other current liabilities)	$	1,169
Operating lease liabilities, non-current		66,650
Total	$	67,819

The operating lease costs for all operating leases were $9.4 million, $11.2 million and $4.6 million for the years ended December 31, 2021, 2020 and 2019, respectively. The operating lease costs and total commitments for short-term leases were *de minimis* for the years ended December 31, 2021, 2020 and 2019. Variable lease costs for operating leases were $4.1 million, $2.1 million and $1.0 million for the years ended December 31, 2021, 2020 and 2019, respectively. The weighted-average remaining lease terms for operating leases were 8.8 and 9.0 years as of December 31, 2021 and 2020, respectively. The weighted-average discount rates for operating leases were 8.4% and 9.6% as of December 31, 2021 and 2020, respectively.

In May 2021, the Company entered into a sublease, whereby the Company agreed to sublease approximately 11,000 square feet of its space in South San Francisco, California currently leased by the Company. The sublease is classified as an operating lease and will expire in March 2031. The monthly fixed payment due to the Company is $0.1 million, subject to annual rent increases in accordance with the contract.

In September 2021, the Company entered into a sublease with Sonoma Biotherapeutics, Inc. ("Sonoma"), a related party, whereby the Company agreed to sublease approximately 18,000 square feet of space in South San Francisco, California currently leased by the Company. See Note 17, *Related-Party Transactions*. As a part of the sublease, in September 2021, the Company received a $4.6 million tenant improvement contribution payment, which will be recognized over the term of the sublease. The sublease is classified as an operating lease and will expire in March 2031. The monthly fixed payment due to the Company is $0.1 million, subject to annual rent increases in accordance with the contract.

10. Convertible Preferred Stock

In March 2020, the Company sold 42,905,042 shares of its Series C convertible preferred stock at a price of $11.49 per share for proceeds of $492.5 million, net of issuance costs of $0.5 million.

In March 2020, the Company repurchased 546,806 shares of its Series A convertible preferred stock from a related party for a purchase price of $4.2 million.

Upon the closing of the IPO, 194,474,431 shares of convertible preferred stock then outstanding converted into an equal number of shares of common stock. As of December 31, 2021, no shares of convertible preferred stock were outstanding.

11. Stockholders' Equity (Deficit)

The Company amended and restated its certificate of incorporation effective June 2021, increasing the number of shares the Company has the authority to issue to 510.0 million shares, of which 500.0 million are common shares and 10.0 million shares are preferred stock.

Preferred Stock

The Company is authorized to issue 10.0 million shares of preferred stock, par value $0.0001 per share. As of December 31, 2021, no shares of preferred stock were outstanding.

Common Stock

As of December 31, 2021 and 2020, there were 242,738,350 shares and 15,569,788 shares of the Company's common stock outstanding, respectively, excluding 2,600,002 shares and 7,562,503 shares, respectively, of RSAs outstanding that are subject to vesting requirements.

In March 2020, the Company repurchased 2,032,166 shares of its common stock from a related party for a purchase price of $11.8 million.

12. Stock-based Compensation

2021 Equity Incentive Plan

In June 2021, the Company adopted the 2021 Equity Incentive Plan ("2021 Plan"), which on the date of the underwriting agreement related to the Company's IPO became effective with an initial reserve of 26,662,087 shares, plus any shares subject to outstanding awards granted under the 2018 Equity Incentive Plan ("2018 Plan") that, on or after the effectiveness of the 2021 Plan, terminate or expire before exercise or settlement, are not issued because the award is settled in cash, are forfeited because of the failure to vest or are reacquired or withheld (or not issued) to satisfy a tax withholding obligation or the purchase or exercise price. In addition, the number of shares reserved for issuance under the 2021 Plan will automatically increase on January 1 of each year for a period of ten years, beginning on January 1, 2022 and continuing through January 1, 2031, in an amount equal to (1) 5% of the total number of shares of the Company's common stock outstanding on December 31 of the immediately preceding year, or (2) a lesser number of shares determined by the Company's board of directors no later than December 31 of the immediately preceding year. Under the 2021 Plan, the Company may grant incentive stock options, non-statutory stock options, RSAs, restricted stock units, stock appreciation rights, performance awards and other stock-based awards. Terms of stock awards, including vesting requirements, are determined by the Company's board of directors or by a committee authorized by the Company's board of directors, subject to provisions of the 2021 Plan. The term of any stock option granted under the 2021 Plan cannot exceed ten years. Generally, awards granted by the Company vest over four years, but may be granted with different vesting terms. In conjunction with adopting the 2021 Plan, the Company discontinued the 2018 Plan with respect to new equity awards.

As of December 31, 2021, 24.7 million shares were available for future issuance pursuant to the 2021 Plan.

2021 Employee Stock Purchase Plan

In June 2021, the Company adopted the 2021 Employee Stock Purchase Plan ("2021 ESPP"), which became effective immediately prior to the execution of the underwriting agreement related to the Company's IPO with an initial reserve of 2,470,000 shares. The 2021 ESPP allows eligible employees to purchase shares of the Company's common stock at a discount through payroll deductions of up to 15% of their earnings, subject to plan limitations. Unless otherwise determined by the Company's board of directors, employees are able to purchase shares at 85% of the lower of the fair market value of the Company's common stock on the first date of an offering or on the purchase date. The number of shares of the Company's common stock reserved for issuance under the 2021 ESPP will automatically increase on January 1 of each year for a period of ten years, beginning on January 1, 2022 and continuing through January 1, 2031, by the lesser of (1) 1% of the total number of shares of the Company's common stock outstanding on December 31 of the immediately preceding year, and (2) 4,940,000 shares; provided, however, that the Company's board of directors may act to provide a lesser increase in number of shares. The Company may specify offerings with durations not more than 27 months and may specify shorter purchase periods within each offering. No shares have been issued under the 2021 ESPP as of December 31, 2021.

2018 Equity Incentive Plan

In 2018, the Company established the 2018 Plan under which it may grant incentive stock options, non-statutory stock options, RSAs, restricted stock units, stock appreciation rights, and other stock-based awards. Terms of stock awards, including vesting requirements, are determined by the board of directors or by a committee authorized by the Company's board of directors, subject to provisions of the 2018 Plan. The term of any stock option granted under the 2018 Plan cannot exceed ten years. Generally, awards granted by the Company vest over four years, but may be granted with different vesting terms. Pursuant to the terms of the 2021 Plan, any shares subject to outstanding options originally granted under the 2018 Plan that terminate, expire or lapse for any reason without the delivery of shares to the holder thereof shall become available for issuance pursuant to awards granted under the 2021 Plan. While no shares are available for future issuance under the 2018 Plan, it continues to govern outstanding equity awards granted thereunder.

Stock-based Compensation Expense

Stock-based compensation expense by classification included within the consolidated statements of operations and comprehensive loss was as follows (in thousands):

	Year Ended December 31,		
	2021	2020	2019
Research and development	$ 15,328	$ 14,977	$ 4,926
General and administrative	46,873	18,284	10,806
Total stock-based compensation expense	$ 62,201	$ 33,261	$ 15,732

Stock-based compensation expense for the year ended December 31, 2021 includes the impact of awards accelerated in connection with the Company's IPO of $2.6 million.

Stock Options and RSA Modifications

Stock-based compensation expense includes costs related to stock option and RSA modifications in the years ended December 31, 2021 and 2020. The modifications were due to the reduction in the service level for certain employees, including the former chief executive officer ("CEO"), changes in vesting schedules and an increase to certain awards' post-termination exercise periods. The modifications impacted both vested and unvested awards. Expense associated with vested awards was recognized in the period of the modification and expense associated with unvested awards is recognized over the remaining service life of the options or RSAs. The following is a summary of the incremental stock-based compensation expense recognized during the years ended December 31, 2021 and 2020, as well as expense to be recognized in future periods as a result of the modifications (in thousands):

		Year Ended December 31,		Future
	Total	2021	2020	Expense
2021 Equity Modifications:				
Former CEO - Options	$ 21,948	$ 4,105	$ —	$ 17,843
Other - Options	1,019	1,019	—	—
Former CEO - RSA	10,908	3,237	—	7,671
2020 Equity Modifications:				
Former CEO - Options	15,052	6,044	2,755	6,253
Other - Options	4,717	1,153	2,954	610
Former CEO - RSA	20,799	10,168	4,701	5,930
Other - RSA	9,029	1,975	7,054	—
Total	$ 83,472	$ 27,701	$ 17,464	$ 38,307

Repricing

Stock-based compensation expense includes the impact of the Company repricing certain stock options in December 2019 by canceling all existing outstanding option grants with a per share exercise price at, and higher than, $4.78 in exchange for new option grants at an exercise price of $3.65 per share. Except for the change in exercise price, the new options had the same terms and conditions as the original options, including the contractual term, vesting schedule and vesting start date. The total amount of incremental stock-based compensation expense associated with the repricing was

$3.3 million, of which $0.3 million, $0.7 million and $0.6 million were recognized for the years ended December 31, 2021, 2020 and 2019, respectively. Amounts relating to options that were already vested were recorded on the date of the modification and amounts relating to options that were unvested are expensed over the remaining vesting term of the new options. Stock-based compensation expense also includes the impact of the accelerated vesting of certain RSAs in 2019, resulting in an incremental expense of $8.6 million, which was recorded for the year ended December 31, 2019.

At December 31, 2021, total stock-based compensation cost related to unvested awards not yet recognized was $136.8 million, which is expected to be recognized over a remaining weighted-average period of 2.33 years.

Restricted Stock Awards

A summary of the Company's RSAs activity were as follows:

	Number of Shares		Weighted-Average Value at Grant Date Per Share
Unvested shares as of December 31, 2020	7,562,503	$	0.0001
Vested	(4,943,751)	$	0.0001
Forfeited	(18,750)	$	0.0001
Unvested shares as of December 31, 2021	2,600,002	$	0.0001

The fair value of RSAs vested during the years ended December 31, 2021, 2020 and 2019 was $57.1 million, $29.4 million and $33.5 million, respectively.

Stock Options

A summary of the Company's stock option activity were as follows:

	Number of Stock Options		Weighted-Average Exercise Price Per Share	Weighted-Average Remaining Contractual Life (in years)		Aggregate Intrinsic Value (in thousands)
Options outstanding as of December 31, 2020	34,413,889	$	3.33	8.67	$	100,223
Granted	12,947,501	$	9.09			
Exercised	(2,750,380)	$	3.43			
Canceled or forfeited	(2,835,831)	$	4.19			
Options outstanding as of December 31, 2021	41,775,179	$	5.05	7.84	$	142,076
Options exercisable as of December 31, 2021	23,716,000	$	3.39	7.08	$	110,520

The fair value of stock options granted to employees, directors and consultants was estimated on the date of grant using the Black-Scholes option pricing model using the following assumptions:

	Year Ended December 31,		
	2021	2020	2019
Risk-free interest rate	0.80 %	0.79 %	1.91 %
Expected volatility	79 %	75 %	75 %
Expected term (in years)	6.10	6.11	6.08
Expected dividend yield	0 %	0 %	0 %

The weighted-average grant date fair value of options granted for the years ended December 31, 2021, 2020 and 2019 was $6.59 per share, $3.36 per share and $2.24 per share, respectively. The intrinsic value of options exercised during the years ended December 31, 2021 and 2020 was $16.1 million and $0.3 million, respectively. No options were exercised for the year ended December 31, 2019.

13. Income Taxes

The Company has reported pre-tax operating losses for all periods presented. The Company's net losses are derived solely from within the U.S. The Company has not reflected any benefit for corresponding tax net operating loss carryforwards in the accompanying consolidated financial statements. The Company has established a full valuation allowance against its deferred tax assets due to the uncertainty surrounding the realization of such assets.

As of December 31, 2021 and 2020, the Company had U.S. federal net operating loss ("NOL") carryforwards of approximately $271.0 million and $116.1 million, respectively, which were available to reduce future taxable income and do not expire. The Company also had U.S. state NOL carryforwards of $199.4 million that begin to expire in 2038. The Company had gross U.S. federal and state tax credits of $9.8 million and $5.7 million as of December 31, 2021 and 2020, respectively, which may be used to offset future tax liabilities. The federal NOL carryforward period is indefinite, while the tax credits will begin to expire in 2039. The attributed carryforwards may become subject to annual limitations in the event of certain cumulative changes in the ownership interest of significant stockholders. This could limit the amount of tax attributes that can be utilized annually to offset future taxable income or tax liabilities.

A reconciliation of income taxes computed using the U.S. federal statutory rate to that reflected in operations follows:

	Year Ended December 31,		
	2021	2020	2019
Federal statutory tax	21.00 %	21.00 %	21.00 %
State tax, net of federal benefit	6.39	4.71	0.52
Valuation allowance	(22.43)	(24.60)	(15.27)
Convertible preferred stock tranche liabilities	—	—	(5.75)
Stock-based compensation	(5.92)	(1.77)	(1.69)
Tax credits	0.99	0.95	1.24
Other	(0.03)	(0.29)	(0.05)
Effective income tax rate	0.00 %	0.00 %	0.00 %

The principal components of the Company's net deferred tax assets were as follows (in thousands):

	Year Ended December 31,	
	2021	2020
Deferred tax assets:		
Net operating loss carryforwards	$ 70,855	$ 28,692
Tax credit carryforwards	8,338	4,980
Accrued liabilities & allowances	3,879	3,518
Deferred revenue	8,224	8,997
Amortization	15,961	14,375
Investment basis difference	13,587	3,334
Lease liability	18,429	13,421
Stock-based compensation	2,872	5,175
Other	2,613	1,454
Gross deferred tax assets	144,758	83,946
Valuation allowance	(127,226)	(71,093)
Deferred tax assets, net of valuation allowance	17,532	12,853
Deferred tax liabilities:		
Operating lease right-of-use assets	(12,647)	(11,221)
Property and equipment	(4,885)	(1,632)
Deferred tax liabilities	(17,532)	(12,853)
Net deferred tax assets	$ —	$ —

The Company maintains a full valuation allowance on its net U.S. deferred tax assets. The assessment regarding whether a valuation allowance is required considers the evaluation of both positive and negative evidence when concluding whether it is more likely than not that deferred tax assets are realizable. In making this assessment, significant weight is given to evidence that can be objectively verified. In its evaluation, the Company considered its cumulative loss in recent years and its forecasted losses in the near-term as significant negative evidence. Based upon a review of the four sources of income identified within ASC 740, *Accounting for Income Taxes* ("ASC 740"), the Company determined that the negative evidence outweighed the positive evidence and a full valuation allowance on its U.S. net deferred tax assets will be maintained. The valuation allowance relates primarily to net U.S. deferred tax assets from net operating loss carryforwards, research and development tax credit carryforwards, research and development expenses capitalized and amortized for tax but deducted for GAAP and stock-based compensation.

The Company will continue to assess the realizability of its deferred tax assets and adjust the valuation allowance as required by ASC 740. The increase in the valuation allowance was $56.1 million and $50.4 million for the years ended December 31, 2021 and 2020, respectively.

The Company evaluates its uncertain tax positions based on a determination of whether it is more likely than not such position will be sustained based upon its technical merits and upon examination by the relevant income tax authorities with all facts known. The Company applies judgment in its measurement of an uncertain tax position recorded in its consolidated financial statements and tax return. As of December 31, 2021 and 2020, there are no penalties or accrued interest recorded in the consolidated financial statements.

The Company is generally subject to examination by the U.S. federal and local income tax authorities for all tax years in which a loss carryforward is available. The Company is currently not under examination by the Internal Revenue Service or other jurisdictions for any tax years.

The following table summarized changes to the Company's unrecognized tax benefits (in thousands):

	Year Ended December 31,	
	2021	2020
Beginning balance	$ —	$ —
Additions based on tax position related to the current year	396	—
Additions based on prior year tax positions	400	—
Ending balance	$ 796	$ —

14. Net Loss Per Share

Basic and diluted net loss per share attributed to common stockholders is calculated by dividing net loss attributed to common stockholders by the weighted average number of common shares outstanding during the period, without consideration for common stock equivalents. The Company's potentially dilutive shares, which include preferred stock, unvested RSAs and options to purchase common stock, are considered to be common stock equivalents and are only included in the calculation of diluted net loss per share when their effect is dilutive.

The amounts in the table below were excluded from the calculation of diluted net loss per share attributed to common stockholders for the periods indicated due to their anti-dilutive effect:

	Year Ended December 31,		
	2021	2020	2019
Convertible preferred stock	—	194,474,431	152,116,195
Unvested RSAs	2,600,002	7,562,503	13,663,338
Options to purchase common stock	41,775,179	34,413,889	27,028,217
Total	44,375,181	236,450,823	192,807,750

15. Employee Benefit Plan

In January 2019, the Company adopted a 401(k) retirement and savings plan (the "401(k) Plan") covering all of its employees. The 401(k) Plan allows employees to make pre- and post-tax contributions up to the maximum allowable amount set by the IRS. As of December 31, 2021, the Company had not made any matching contributions to the 401(k) Plan on behalf of participants.

16. Commitments and Contingencies

Collaboration and License Agreements

The Company has entered into certain collaboration and license agreements, including those identified in Note 3, *Collaboration, License and Success Payment Agreements* above, with third parties that include the funding of certain development, manufacturing and commercialization efforts with the potential for future milestone and royalty payments upon the achievement of pre-established developmental, regulatory and/or commercial milestones. The Company's obligation to fund these efforts is contingent upon continued involvement in the programs and/or the lack of any adverse events that could cause the discontinuance of the programs. Due to the nature of these agreements, the future potential payments are inherently uncertain, and accordingly no amounts had been recorded for the potential future achievement of these targets as of December 31, 2021 and 2020.

17. Related-Party Transactions

In September 2021, the Company entered into a sublease with Sonoma, with whom the Company has common stockholders with board seats. As a part of the sublease, a $4.6 million tenant improvement contribution payment was made by Sonoma, which will be recognized over the term of the sublease. As of December 31, 2021, accrued liabilities and other current liabilities of $0.5 million and other non-current liabilities of $4.0 million were in connection with the sublease with Sonoma. Income of $1.8 million was recognized in other operating income, net for the year ended December 31, 2021. See Note 9, *Leases*, for more detail on the Sonoma sublease.

The Company is party to the GSK Agreement, who is a holder of more than 10% of the Company's equity. See Note 3, *Collaboration, License and Success Payment Agreements*. Deferred revenue of $5.0 million and $6.1 million as of December 31, 2021 and 2020, respectively, and deferred revenue, net of current portion of $79.7 million and $89.1 million as of December 31, 2021 and 2020, respectively, were in connection with the GSK Agreement. Revenue recognized in connection with the GSK agreement was $10.5 million, $7.8 million and $0.7 million for the years ended December 31, 2021, 2020 and 2019, respectively.

In March 2020, the Company repurchased 546,806 shares of its Series A convertible preferred stock and 2,032,166 shares of its common stock from a related party. See Note 10, *Convertible Preferred Stock* and Note 11, *Stockholders' Equity (Deficit)*.

18. Asset Acquisition

In May 2020, the Company completed the acquisition of 100% of the outstanding equity of Immulus, Inc. ("Immulus"), a company focused on developing technology platforms that enable the development and production of cell therapeutics. As consideration for the acquisition, the Company paid $3.5 million in cash and issued an aggregate of 688,463 shares of its common stock, with an estimated fair value of $4.0 million. The Company also incurred $0.5 million of direct expenses, for total consideration of $8.0 million.

The Company concluded the acquisition did not meet the accounting definition of a business as inputs were acquired, but no processes or outputs were acquired. Consequently, the Company accounted for the transaction as an asset acquisition with the value concentrated in IPR&D. The following table summarizes the fair value of assets acquired (in thousands):

Other assets	$	487
In-process research and development (IPR&D)		7,528
Total assets acquired	$	8,015

The amount allocated to the IPR&D asset was charged to research and development expenses for the year ended December 31, 2020 as this asset had no alternative future use at the time of the acquisition transaction.

In addition, the Company is also required to make milestone payments of up to $37.0 million to the former stockholders of Immulus upon successful completion of specified development milestones. Triggering of these milestones payments was not considered probable as of the date of the acquisition, and no expense has been recorded for these milestones for the years ended December 31, 2021 and 2020.

Item 9. Changes in and Disagreements With Accountants on Accounting and Financial Disclosure

None.

Item 9A. Controls and Procedures

Evaluation of Disclosure Controls and Procedures

As of December 31, 2021, management, with the participation and supervision of our Chief Executive Officer and Chief Financial Officer, have evaluated our disclosure controls and procedures as defined in Rules 13a-15(e) and 15d-15(e) of the Exchange Act. Our disclosure controls and procedures are designed to ensure that information required to be disclosed in the reports we file or submit under the Exchange Act 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 the Chief Executive Officer and the Chief Financial Officer, to allow timely decisions regarding required disclosures.

Any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving the desired control objective and management necessarily applies its judgment in evaluating the cost-benefit relationship of possible controls and procedures. Based on this evaluation, our Chief Executive Officer and Chief Financial Officer concluded that, as of December 31, 2021, the design and operation of our disclosure controls and procedures were effective at a reasonable assurance level.

Management's Annual Report on Internal Control Over Financial Reporting

This report does not include a report of management's assessment regarding internal control over financial reporting due to a transition period established by rules of the SEC for newly public companies.

Attestation Report of the Registered Public Accounting Firm

This Annual Report on Form 10-K does not include an attestation report of our registered public accounting firm due to an exemption established by the JOBS Act for "emerging growth companies."

Changes in Internal Control over Financial Reporting

There has been no change in our internal control over financial reporting during the quarter ended December 31, 2021 that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

Item 9B. Other Information

None.

Item 9C. Disclosure Regarding Foreign Jurisdictions that Prevent Inspections

Not applicable.

PART III

Item 10. Directors, Executive Officers and Corporate Governance

The information required by this item is incorporated by reference to our Proxy Statement for the 2022 Annual Meeting of Stockholders to be filed with the SEC within 120 days of the fiscal year ended December 31, 2021.

Item 11. Executive Compensation

The information required by this item is incorporated by reference to our Proxy Statement for the 2022 Annual Meeting of Stockholders to be filed with the SEC within 120 days of the fiscal year ended December 31, 2021.

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters

The information required by this item is incorporated by reference to our Proxy Statement for the 2022 Annual Meeting of Stockholders to be filed with the SEC within 120 days of the fiscal year ended December 31, 2021.

Item 13. Certain Relationships and Related Transactions, and Director Independence

The information required by this item is incorporated by reference to our Proxy Statement for the 2022 Annual Meeting of Stockholders to be filed with the SEC within 120 days of the fiscal year ended December 31, 2021.

Item 14. Principal Accountant Fees and Services

The information required by this item is incorporated by reference to our Proxy Statement for the 2022 Annual Meeting of Stockholders to be filed with the SEC within 120 days of the fiscal year ended December 31, 2021.

PART IV

Item 15. Exhibit and Financial Statement Schedules

(a) The following documents are being filed as part of this report:

(1) The following financial statements and the Report of Independent Registered Public Accounting Firm are included in Part II, Item 8:

(2) All financial statement schedules are omitted because the information is inapplicable or presented in the Notes to Consolidated Financial Statements.

(3) The following Exhibits are filed as part of this report.

		Incorporation by Reference				
Exhibit Number	Exhibit Description	Form	File Number	Exhibit/ Appendix Reference	Filing Date	Filed Herewith
3.1	Amended and Restated Certificate of Incorporation.	S-8	333-257249	4.1	6/21/2021	
3.2	Amended and Restated Bylaws.	S-8	333-257249	4.2	6/21/2021	
4.1	Form of Common Stock Certificate.	S-1/A	333-256470	4.1	6/9/2021	
4.2	Amended and Restated Investors' Rights Agreement, by and among the Registrant and certain of its stockholders, dated March 5, 2020.	S-1	333-256470	4.2	5/25/2021	
10.1	Lyell Immunopharma, Inc. 2018 Equity Incentive Plan, as amended.	S-1	333-256470	10.1	5/25/2021	
10.2	Forms of Stock Option Grant Notice, Stock Option Agreement and Notice of Exercise and Restricted Stock Award Agreement under the Lyell Immunopharma, Inc. 2018 Equity Incentive Plan.	S-1	333-256470	10.2	5/25/2021	
10.3	Lyell Immunopharma, Inc. 2021 Equity Incentive Plan.	S-1/A	333-256470	10.3	6/09/2021	
10.4	Forms of Stock Option Grant Notice, Stock Option Agreement and Notice of Exercise under the Lyell Immunopharma, Inc. 2021 Equity Incentive Plan.	S-1/A	333-256470	10.4	6/9/2021	
10.5	Forms of Restricted Stock Unit Grant Notice and Award Agreement under the Lyell Immunopharma, Inc. 2021 Equity Incentive Plan.	S-1/A	333-256470	10.5	6/9/2021	
10.6	Lyell Immunopharma, Inc. 2021 Employee Stock Purchase Plan.	S-1/A	333-256470	10.6	6/9/2021	
10.7	Lyell Immunopharma, Inc. 2021 Non-Employee Director Compensation Policy.	S-1/A	333-256470	10.7	6/9/2021	
10.8	Lyell Immunopharma, Inc. Officer Severance Plan.					X

Exhibit Number	Exhibit Description	Incorporation by Reference				Filed Herewith
		Form	File Number	Exhibit/ Appendix Reference	Filing Date	
10.9	Form of Indemnification Agreement by and between the Registrant and its directors and executive officers.	S-1	333-256470	10.9	5/25/2021	
10.10	Amended Offer Letter by and between the Registrant and Richard Klausner, dated July 23, 2020.	S-1	333-256470	10.10	5/25/2021	
10.11	Amended Offer Letter by and between the Registrant and Elizabeth Homans, dated July 23, 2020.	S-1	333-256470	10.11	5/25/2021	
10.12	Offer Letter by and between the Registrant and Charles Newton, dated February 3, 2021.	S-1	333-256470	10.12	5/25/2021	
10.13	Offer Letter by and between the Registrant and Heather Turner, dated February 1, 2019.	S-1	333-256470	10.13	5/25/2021	
10.14	Offer Letter by and between the Registrant and Stephen Hill, dated May 9, 2019.	S-1	333-256470	10.14	5/25/2021	
10.15	Collaboration and License Agreement by and between the Registrant, GlaxoSmithKline Intellectual Property (No. 5) Limited and Glaxo Group Limited, dated May 23, 2019, as amended.	S-1/A	333-256470	10.15	6/9/2021	
10.16*	Second Amendment to the Collaboration and License Agreement between the Registrant, GlaxoSmithKline Intellectual Property (No.5) Limited and Glaxo Group Limited, dated December 16, 2021.					X
10.17	License Agreement by and between the Registrant and The Board of Trustees of the Leland Stanford Junior University, dated January 29, 2019.	S-1	333-256470	10.16	5/25/2021	
10.18	Success Payment Agreement, by and between the Registrant and The Board of Trustees of the Leland Stanford Junior University, dated October 1, 2020.	S-1	333-256470	10.17	5/25/2021	
10.19	Success Payment Agreement, by and between the Registrant and Fred Hutchinson Cancer Research Center, dated December 19, 2018.	S-1	333-256470	10.18	5/25/2021	
10.20	Standard Office Lease for Building C by and between the Registrant and Bre Wa Office Owner LLC, dated August 28, 2019.	S-1	333-256470	10.19	5/25/2021	
10.21	Standard Office Lease for Building E by and between the Registrant and Bre Wa Office Owner LLC, dated August 28, 2019.	S-1	333-256470	10.20	5/25/2021	
10.22	Lease by and between the Registrant and BMR-500 Fairview Avenue LLC, dated November 27, 2018, as amended.	S-1	333-256470	10.21	5/25/2021	
10.23	Lease Agreement by and between the Registrant and ARE-San Francisco No. 65, LLC, dated August 15, 2019, as amended.	S-1	333-256470	10.22	5/25/2021	
23.1	Consent of independent registered public accounting firm.					X
24.1	Power of Attorney (included on signature page).					X

Exhibit Number	Exhibit Description	Incorporation by Reference				Filed Herewith
		Form	File Number	Exhibit/ Appendix Reference	Filing Date	
31.1	Certification of Principal Executive Officer Pursuant to Rules 13a-14(a) and 15d-14(a).					X
31.2	Certification of Principal Financial Officer Pursuant to Rules 13a-14(a) and 15d-14(a).					X
32.1	Certifications of Principal Executive Officer and Principal Financial Officer Pursuant to 18 U.S.C. Section 1350.					X
101.INS	XBRL Instance Document.	The XBRL 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.					X
101.CAL	Inline XBRL Taxonomy Extension Calculation Linkbase Document.					X
101.DEF	Inline XBRL Taxonomy Extension Definition Linkbase Document.					X
101.LAB	Inline XBRL Taxonomy Extension Label Linkbase Document.					X
101.PRE	Inline XBRL Taxonomy Extension Presentation Linkbase Document.					X
104	Cover Page Interactive Data File.	Formatted as Inline XBRL and contained in Exhibit 101.				

*Portions of this exhibit (indicated by [*]) have been omitted because the registrant has determined that the information is both not material and is the type that the registrant treats as private or confidential.

Item 16. Form 10-K Summary

None.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Act of 1934, the Registrant has duly caused this Annual Report on Form 10-K to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of South San Francisco, State of California on March 29, 2022.

LYELL IMMUNOPHARMA, INC.

By: /s/ ELIZABETH HOMANS
Name: **Elizabeth Homans**
Title: Chief Executive Officer

POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints Elizabeth Homans, Charles Newton and Heather Turner, and each of them, as his or her true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution, for him or her and in his or her name, place and stead, in any and all capacities, to sign any and all amendments to this Annual Report on Form 10-K, and to file the same, with all exhibits thereto and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as he or she might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, or any of them, or their or his or her substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Act of 1934, this Annual Report on Form 10-K has been signed by the following persons on behalf of the Registrant and in the capacities and on the dates indicated:

Signature	Title	Date
/s/ ELIZABETH HOMANS **Elizabeth Homans**	Chief Executive Officer and Director *(Principal Executive Officer)*	March 29, 2022
/s/ CHARLES NEWTON **Charles Newton**	Chief Financial Officer *(Principal Financial and Accounting Officer)*	March 29, 2022
/s/ RICHARD D. KLAUSNER **Richard D. Klausner, M.D.**	Chair of the Board of Directors	March 29, 2022
/s/ HANS BISHOP **Hans Bishop**	Director	March 29, 2022
/s/ OTIS BRAWLEY **Otis Brawley, M.D.**	Director	March 29, 2022
/s/ CATHERINE FRIEDMAN **Catherine Friedman**	Director	March 29, 2022
/s/ ELIZABETH NABEL **Elizabeth Nabel, M.D.**	Director	March 29, 2022
/s/ ROBERT NELSEN **Robert Nelsen**	Director	March 29, 2022
/s/ WILLIAM RIEFLIN **William Rieflin**	Director	March 29, 2022
/s/ LYNN SEELY **Lynn Seely, M.D.**	Director	March 29, 2022

LYELL IMMUNOPHARMA, INC.

OFFICER SEVERANCE PLAN

(As Amended and Restated February 11, 2022)

The Lyell Immunopharma, Inc. Officer Severance Plan was established as of the Effective Date and is amended and restated effective as of February 11, 2022. The purpose of the Plan is to provide severance and/or accelerated vesting benefits to certain eligible employees of Lyell Immunopharma, Inc. who incur a Qualifying Termination as described herein. Except with respect to individually negotiated employment contracts or agreements with the Company providing severance benefits that an Eligible Employee has not agreed to forgo, this Plan supersedes any severance plan, policy or practice with respect to Qualifying Terminations, whether formal or informal, written or unwritten, previously announced or maintained by the Company. The Plan is an "employee welfare benefit plan," as defined in Section 3(1) of ERISA. This document constitutes both the written instrument under which the Plan is maintained and the required summary plan description for the Plan.

Section 1. DEFINITIONS. As hereinafter used:

1.1 "Affiliate" means, with respect to any individual or entity, any other individual or entity who, directly or indirectly through one or more intermediaries, controls, is controlled by or is under common control with, such individual or entity.

1.2 "Benefits Schedule" has the meaning set forth in 2.3.

1.3 "Board" means the Board of Directors of the Company.

1.4 "Cause" means, with respect to any Eligible Employee, (i) "Cause" as defined in the applicable Employment Agreement between the Eligible Employee and the Company; or (ii) in the absence of any definition of "Cause" contained in such Employment Agreement, (a) the Eligible Employee is indicted for, convicted of, or pleads guilty or nolo contendre to, a felony or crime involving moral turpitude; (b) the Eligible Employee engages in conduct that constitutes willful gross negligence, willful misconduct, or unsatisfactory performance in carrying out the Eligible Employee's duties under the Eligible Employee's Employment Agreement, and, if curable, such breach remains uncured following fifteen (15) days prior written notice given by the Company to the Eligible Employee specifying such conduct; (c) the Eligible Employee has breached any covenant or any material provision of any agreement with the Company, including among other things, a willful and material breach of written Company policy, and, if curable, such breach remains uncured following fifteen (15) days' prior written notice specifying such breach given by the Company to the Eligible Employee; (d) the Eligible Employee's material violation of federal law or state law that the Board reasonably determines has had or is reasonably likely to have a material detrimental effect on the Company's reputation or business; or (e) the Eligible Employee's act of fraud or dishonesty in the performance of the Eligible Employee's job duties.

1.5 "Change in Control" means any transaction or series of related transactions pursuant to which any individual or entity acquires (a) more than fifty percent (50%) of the issued and outstanding equity securities of the Company or (b) all or substantially all of the assets of the Company (in either case, whether by merger, consolidation, sale, exchange, issuance, transfer or redemption of the Company's equity securities by sale, exchange or transfer of the Company's consolidated assets or otherwise), provided that, where applied to compensation subject to Section 409A, any acceleration of or change in payment shall only apply

(if required by Section 409A) if the corporate transaction is also a change in control event described in Treasury Regulation 1.409A-3(i)(5).

1.6 "Change in Control Protection Period" means the period beginning on the date that is three (3) months prior to the effective date of a Change in Control and ending on the date that is the one (1)-year anniversary of the effective date of such Change in Control.

1.7 "COBRA" means the Consolidated Omnibus Budget Reconciliation Act of 1985, as amended.

1.8 "COBRA Payment Period" has the meaning set forth in 2.4.

1.9 "Code" means the Internal Revenue Code of 1986, as amended.

1.10 "Committee" means the Compensation Committee of the Board, or a delegate thereof, which in each case is also referred to under the Plan as the "Plan Administrator".

1.11 "Company" means Lyell Immunopharma, Inc., a Delaware corporation, and any successors thereto.

1.12 "Disability" means, with respect to an Eligible Employee, such Eligible Employee is unable to engage in any substantial gainful activity by reason of any medically determinable physical or mental impairment which can be expected to result in death or which has lasted or can be expected to last for a continuous period of not less than 12 months, as provided in Section 22(e)(3) of the Code, and will be determined by the Plan Administrator on the basis of such medical evidence as the Plan Administrator deems warranted under the circumstances.

1.13 "Effective Date" means July 29, 2019.

1.14 "Eligible Employee" means an employee of the Company who holds the title of VP or above and (i) is designated by the Plan Administrator, in its sole discretion, to be eligible for severance benefits under the Plan, and (ii) if applicable, agrees to forgo severance benefits provided under an individually negotiated employment contract or agreement with the Company relating to severance or change in control benefits. The Plan Administrator shall make the determination of whether an employee is an Eligible Employee, and such determination shall be binding and conclusive on all persons. The Plan Administrator shall maintain a current schedule of Eligible Employees with the General Counsel of the Company or such other Company officer as may be designated by the Plan Administrator. Temporary employees and independent contractors are not eligible to participate in the Plan.

1.15 "Employment Agreement" means an agreement entered into between the Company and an individual with respect to their employment with the Company that is expressly titled an "Employment Agreement," as such agreement may be amended or restated from time to time.

1.16 "ERISA" means the Employee Retirement Income Security Act of 1974, as amended.

1.17 "Good Reason" means that the Eligible Employee, without the Eligible Employee's express, written consent, (a) has incurred a material reduction in authority, title, duties or responsibilities at the Company or a successor employer (with respect to a termination in connection with a Change in Control, relative to the Eligible Employee's authority, title, duties or responsibilities immediately prior to the Change in Control); (b) has suffered a material breach of the Eligible Employee's Employment Agreement (if any) by the Company or a successor

employer; (c) has been required to relocate or travel more than fifty (50) miles from the Eligible Employee's then current place of employment in order to continue to perform the duties and responsibilities of the Eligible Employee's position (not including customary travel as may be required by the nature of the Eligible Employee's position); or (d) has been directed by the Board to violate knowingly and intentionally any material state, federal or foreign law, rule or regulation applicable to the Company. Termination of employment by the Eligible Employee will not be for Good Reason unless (1) the Eligible Employee notifies the Company in writing within thirty (30) days of the initial existence of such condition (which notice specifically identifies such condition), (2) the Company fails to remedy such condition within thirty (30) days after the date on which it receives such notice (the "Remedial Period"), and (3) the Eligible Employee actually terminates employment immediately after the expiration of the Remedial Period and before the Company remedies such condition. If the Eligible Employee terminates employment before the expiration of the Remedial Period or after the Company remedies the condition (even if after the end of the Remedial Period), then the Eligible Employee's termination will not be considered to be for Good Reason.

1.18 "Parachute Amount" has the meaning set forth in Section 2.7.

1.19 "Plan" means the Lyell Immunopharma, Inc. Officer Severance Plan, as set forth herein, as it may be amended from time to time.

1.20 "Plan Administrator" has the meaning set forth in Section 1.8.

1.21 "Reduced Amount" has the meaning set forth in Section 2.7.

1.22 "Release Effective Date" has the meaning set forth in Section 2.8.

1.23 "Section 409A" has the meaning set forth in Section 2.9.

1.24 "Qualifying Termination" means (a) the termination of an Eligible Employee's employment by the Company without Cause and other than due to the Eligible Employee's death or Disability, or (b) a resignation by the Eligible Employee for Good Reason. The transfer of an Eligible Employee's employment following a Change of Control from the entity resulting from the Change in Control to an Affiliate thereof shall not, in and of itself, constitute a Qualifying Termination.

1.25 "Release" has the meaning set forth in 2.8.

1.26 "Severance Pay" has the meaning set forth in 2.3.

1.27 "Severance Period" has the meaning set forth in 2.3.

1.28 "Special Severance Payment" has the meaning set forth in 2.4.

1.29 "Termination Date" means the date on which an Eligible Employee incurs a Qualifying Termination.

1.30 "Tier I Employee" means any Eligible Employee who prior to the Termination Date or a Change in Control was identified by the Company as a CEO Report or C-Suite executive, except for the CEO (who, for the avoidance of doubt, is excluded from this Plan).

1.31 "Tier II Employee" means any Eligible Employee who prior to a Change in Control was identified by the Company as an SVP or otherwise designated as a Tier II Employee by the CEO or President.

1.32 "Tier III Employee" means any Eligible Employee who prior to a Change in Control was identified by the Company as a VP.

Section 2. SEVERANCE BENEFITS.

2.1 Generally. Subject to the terms of the Plan (including, without limitation, Sections 2.6, 2.8 and 2.9 below), each Eligible Employee shall be entitled to severance payments and/or benefits pursuant to applicable provisions of Section 2 of this Plan if the Eligible Employee incurs a Qualifying Termination and complies with the applicable requirements of the Plan.

2.2 Notice. Any Qualifying Termination effected by the Company following the Effective Date shall require ten (10) business days' prior written notice; provided, however, that the Company may, in its sole discretion, pay the Eligible Employee in lieu of all or part of such notice period.

2.3 Severance Pay. The Company shall provide "Severance Pay" to each Eligible Employee who incurs a Qualifying Termination equal to the applicable amount listed in such Eligible Employee's applicable tier level in the Schedule of Severance Benefits as attached hereto as Schedule A (the "Benefits Schedule"). Severance Pay shall be paid in approximately equal installments in accordance with the Company's regular payroll practices over the applicable "Severance Period" indicated in the Benefits Schedule, provided that severance payments shall commence to be paid on the first regular payroll date of the Company that occurs after the Release Effective Date (as defined below), and the first payment thereof shall include a catch-up payment to cover amounts retroactive to the day immediately following the Termination Date, with the balance of the payments paid thereafter on the schedule described above. Notwithstanding the foregoing, any guaranteed bonus or discretionary bonus that the Company had determined to pay the Eligible Employee but which had not yet been paid as of the date of the Eligible Employee's Qualifying Termination shall be paid in a lump sum on the next regularly scheduled payroll date following the date on which such Eligible Employee was terminated.

2.4 Benefits Continuation.

(a) If an Eligible Employee incurs a Qualifying Termination, and is eligible for and timely elects group health plan continuation coverage under COBRA, upon the Eligible Employee's submission to the Company of evidence of the Eligible Employee's and the Eligible Employee's dependents, if applicable, enrollment in COBRA, the Company will pay a portion of the Eligible Employee's premiums for the Eligible Employee and the Eligible Employee's dependents to continue group medical, vision and dental coverage under COBRA directly to the insurer or COBRA administrator, as applicable, until the earliest of: (A) the expiration of the Eligible Employee's applicable Severance Period as set forth in the Benefits Schedule, (B) the date on which the Eligible Employee and the Eligible Employee's eligible dependents, if applicable, become covered by the group health plan of a subsequent employer and (C) the expiration of the Eligible Employee's eligibility for continuation coverage under COBRA (the earliest of clauses (A), (B), and (C), the "COBRA Payment Period"). The amount of this portion will be the same portion of the premium cost as was borne by the Company under the level of coverage selected by the Eligible Employee and in effect at the time of the Qualifying Termination. The period of continued benefits under this paragraph shall run concurrently with (and shall count against) the Company's obligation to provide continuation coverage pursuant to COBRA.

(b) Notwithstanding the foregoing, if at any time the Company determines, in its sole discretion, that it cannot provide the COBRA premium benefits above without potentially incurring financial costs or penalties under applicable law (including, without limitation, Section

2716 of the Public Health Service Act), then in lieu thereof, the Company will pay the Eligible Employee on the last day of each remaining month of the COBRA Payment Period a fully taxable cash payment equal to the monthly portion of the premium cost for group medical, vision and dental coverage as was borne by the Company under the level of coverage selected by the Eligible Employee and in effect at the time of the Qualifying Termination, subject to applicable tax withholding (such amount, the "Special Severance Payment"), provided that any Special Severance Payments that otherwise would be payable prior to, or on, the Release Effective Date shall be paid in a single lump sum on the first regularly scheduled payroll date of the Company following the Release Effective Date, and any remaining Special Severance Payments will be paid in accordance with the schedule described above. Any Special Severance Payments will be made regardless of whether the Eligible Employee elects COBRA continuation coverage.

2.5 Vesting Acceleration. In the event of a Qualifying Termination during the Change in Control Protection Period, the Eligible Employee shall receive accelerated vesting with respect to the percentage of shares as set forth in the Eligible Employee's applicable tier level in the Benefits Schedule ("Vesting Acceleration") subject to each of such Eligible Employee's then-outstanding and unvested equity awards which would otherwise become vested solely on the passage of time and such Eligible Employee's continued service to the Company (which, for the avoidance of doubt will not include any such Company equity awards that would otherwise become vested in whole or in part based on the attainment of performance conditions or targets, which awards will be subject to the terms of their underlying award agreements). For the avoidance of doubt, termination or forfeiture of the unvested portion of any of an Eligible Employee's equity awards due to termination of employment will be tolled to the extent necessary to implement this Section but not beyond the expiration date, if applicable, of the applicable equity award.

2.6 Non-Duplication of Benefits.

(a) The benefits provided under the Plan are intended to satisfy, to the greatest extent possible, and not to provide benefits duplicative of, any and all statutory, contractual and collective agreement obligations of the Company in respect of the form of benefits provided under the Plan that may arise out of a Qualifying Termination, and the Plan Administrator will so construe and implement the terms of the Plan. If the Company or any Affiliate is obligated by law or by contract to provide severance pay or change in control benefits to an Eligible Employee, then the Eligible Employee may be required to waive, upon the Company's request, any amounts payable pursuant to such legal or contractual obligation as a condition of receiving benefits under the Plan.

(b) An Eligible Employee shall not be entitled to receive severance benefits under both Sections 1 and 2 of the Benefits Schedule. For clarity, if (a) the Eligible Employee's Qualifying Termination occurs prior to a Change in Control and therefore qualifies the Eligible Employee for severance benefits under Section 1 of the Benefits Schedule and (b) a Change in Control occurs within the 3-month period following the Eligible Employee's Qualifying Termination and therefore qualifies the Eligible Employee for superior severance benefits under Section 2 of the Benefits Schedule, then (i) the Eligible Employee will cease receiving any further payments or benefits under Section 1 of the Benefits Schedule and (ii) the severance benefits otherwise payable under Section 2 of the Benefits Schedule each will be offset by the corresponding payments or benefits the Eligible Employee already received under Section 1 of the Benefits Schedule in connection with the Eligible Employee's Qualifying Termination.

2.7 Impact of Section 4999 Excise Tax: Maximum After-Tax Benefit Following a Change of Control. Except to the extent that a more favorable treatment is provided to an Eligible Employee by the Company in writing, in the event that part or all of the consideration, compensation or benefits to be paid to an Eligible Employee under this Plan or any other plan,

arrangement or agreement applicable to such Eligible Employee, constitutes "excess parachute payments" under Section 280G(b) of the Code subject to an excise tax under Section 4999 of the Code (collectively, the "Parachute Amount"), the amount of excess parachute payments which would otherwise be payable to such Eligible Employee or for such Eligible Employee's benefit shall be reduced to the extent necessary so that no amount of the Parachute Amount is subject to an excise tax under Section 4999 (the "Reduced Amount"); provided that such amounts shall not be so reduced if, without such reduction, such Eligible Employee would be entitled to receive and retain, on a net after-tax basis (including, without limitation, after any excise taxes payable under Section 4999), an amount of the Parachute Amount which is greater than the amount, on a net after-tax basis, that such Eligible Employee would be entitled to retain upon receipt of the Reduced Amount. All determinations with respect to the Parachute Amount shall be made by a nationally recognized certified public accounting firm or other firm that is retained and paid by the Company for such purpose prior to the Change in Control, which firm shall not, without such Eligible Employee's consent, be changed following the Change in Control. Such determinations shall be binding upon the Company and shall be made promptly following the Change in Control and as appropriate thereafter, in order to permit payment in accordance with the provisions of this Plan.

2.8 Release. Notwithstanding anything contained herein to the contrary, no Eligible Employee who incurs a Qualifying Termination shall be eligible to receive any payments or other benefits under the Plan unless he or she first executes a release in favor of the Company in substantially the same form attached hereto as Annex A (the "Release") and the Release becomes effective and irrevocable within sixty (60) days following the Eligible Employee's Termination Date (such date the Release becomes effective and irrevocable, the "Release Effective Date"). If the Release does not become effective and irrevocable within the applicable period above, the Eligible Employee will forfeit any right to receive any severance benefits under the Plan.

2.9 Section 409A. It is intended that payments and benefits under this Plan will not subject Eligible Employees to taxation under Section 409A of the Code and the regulations thereunder ("Section 409A") and, accordingly, this Plan shall be interpreted and administered to be either exempt from or in compliance therewith. Specifically, any taxable benefits or payments provided under this Plan are intended to be separate and distinct payments that qualify for the "short-term deferral" exception to Section 409A to the maximum extent possible, and to the extent they do not so qualify, are intended to qualify for the separation pay exceptions to Section 409A, to the maximum extent possible. To the extent that none of these exceptions (or any other available exception) applies, then notwithstanding anything contained herein to the contrary, and to the extent required to comply with Section 409A, if an Eligible Employee is a "specified employee," as determined under the Company's policy for identifying specified employees on the Eligible Employee's Termination Date, then all amounts due under the Plan that constitute a "deferral of compensation" within the meaning of Section 409A of the Code, that are provided as a result of a separation from service within the meaning of Section 409A, and that would otherwise be paid or provided during the first six months following the Termination Date, shall be accumulated through and paid or provided on the first business day that is more than six months after the Termination Date (or, if the Eligible Employee dies during such six-month period, within 90 days after the Eligible Employee's death). Notwithstanding anything contained herein to the contrary, an Eligible Employee shall not be considered to have terminated employment with the Company for purposes of any payments under this Plan which are subject to Section 409A until the Eligible Employee would be considered to have incurred a "separation from service" within the meaning of Section 409A. If the Company determines that any payments or benefits provided under the Plan constitute "deferred compensation" under Section 409A, and the Eligible Employee's Qualifying Termination occurs at a time during the calendar year when the Release Effective Date could occur in the calendar year following the calendar year in which the Eligible Employee's Qualifying Termination occurs, then regardless of when the Release is returned to the Company and becomes effective, the Release will not be deemed

effective any earlier than the first day of that following calendar year for purposes of determining the timing of provision of any such payments or other benefits under the Plan. In no event may an Eligible Employee, directly or indirectly, designate the calendar year of any payment to be made under this Plan that is considered deferred compensation. The Company makes no representation that any or all of the payments described in this Plan shall be exempt from or comply with Section 409A and makes no undertaking to preclude Section 409A from applying to any such payment. The Eligible Employee shall be solely responsible for the payment of any taxes and penalties incurred under Section 409A.

Section 3. PLAN ADMINISTRATION.

3.1 The Plan Administrator shall administer the Plan and may interpret the Plan, prescribe, amend and rescind rules and regulations under the Plan and make all other determinations necessary or advisable for the administration of the Plan, subject to all of the provisions of the Plan.

3.2 The Plan Administrator may delegate any of its duties hereunder to such person or persons from time to time as it may designate.

3.3 The Plan Administrator is the "named fiduciary" of the Plan for purposes of ERISA and will be subject to the fiduciary standards of ERISA when acting in such capacity.

3.4 The Plan Administrator is empowered, on behalf of the Plan, to engage accountants, legal counsel and such other personnel as it deems necessary or advisable to assist it in the performance of its duties under the Plan. The functions of any such persons engaged by the Plan Administrator shall be limited to the specified services and duties for which they are engaged, and such persons shall have no other duties, obligations or responsibilities under the Plan. Such persons shall exercise no discretionary authority or discretionary control respecting the management of the Plan. All reasonable expenses thereof shall be borne by the Company.

3.5 Any decision made or other action taken by the Plan Administrator prior to a Change in Control with respect to the Plan, and any interpretation by the Plan Administrator prior to a Change in Control of any term or condition of the Plan, or any related document, will be conclusive and binding on all persons and be given the maximum possible deference allowed by law. Following a Change in Control, any decision made or other action taken by the Plan Administrator with respect to the Plan, and any interpretation by the Plan Administrator of any term or condition of the Plan, or any related document that (a) does not affect the benefits payable under the Plan shall not be subject to review unless found to be arbitrary and capricious, or (b) does affect the benefits payable under the Plan shall not be subject to review unless found to be unreasonable or not to have been made in good faith.

Section 4. PLAN MODIFICATION OR TERMINATION.

The Plan may be terminated or amended by the Committee at any time, without advance notice to any Eligible Employee and without regard to the effect of the amendment or termination on any Eligible Employee or on any other individual; provided, however, that the Plan may not be terminated or amended during the Change in Control Protection Period or in respect of a Qualifying Termination that occurred prior to the amendment or termination of the Plan.

Section 5. CLAIMS PROTECTION PROCEDURES.

Claims for benefits under the Plan shall be administered in accordance with Section 503 of ERISA and the Department of Labor Regulations thereunder. Any employee or other person

who believes he or she is entitled to any payment under the Plan (a "claimant") may submit a claim in writing to the Plan Administrator within 90 days of the earlier of (a) the date the claimant learned the amount of their severance benefits under the Plan, or (b) the date the claimant learned that he or she will not be entitled to any benefits under the Plan. In determining claims for benefits, the Plan Administrator or its delegate has the authority to interpret the Plan, to resolve ambiguities, to make factual determinations, and to resolve questions relating to eligibility for and amount of benefits. If the claim is denied (in full or in part), the claimant will be provided a written notice explaining the specific reasons for the denial and referring to the provisions of the Plan on which the denial is based. The notice will also describe any additional information or material that the Plan Administrator needs to complete the review and an explanation of why such information or material is necessary and the Plan's procedures for appealing the denial (including a statement of the applicant's right to bring a civil action under Section 502(a) of ERISA following a denial on review of the claim, as described below). The denial notice will be provided within 90 days after the claim is received. If special circumstances require an extension of time (up to 90 days), written notice of the extension will be given to the claimant (or representative) within the initial 90-day period. This notice of extension will indicate the special circumstances requiring the extension of time and the date by which the Plan Administrator expects to render its decision on the claim. If the extension is provided due to a claimant's failure to provide sufficient information, the time frame for rendering the decision is tolled from the date the notification is sent to the claimant about the failure to the date on which the claimant responds to the request for additional information. The Plan Administrator has delegated the claims review responsibility to the Company's General Counsel or such other individual designated by the Plan Administrator, except in the case of a claim filed by or on behalf of the Company's General Counsel or such other individual designated by the Plan Administrator, in which case, the claim will be reviewed by the Company's Chief Executive Officer.

Section 6. APPEAL PROCEDURE.

If the claimant's claim is denied, the claimant (or his or her authorized representative) may apply in writing to an appeals official appointed by the Plan Administrator (which may be a person, committee or other entity) for a review of the decision denying the claim. Review must be requested within 60 days following the date the claimant received the written notice of their claim denial or else the claimant loses the right to review. A request for review must set forth all of the grounds on which it is based, all facts in support of the request, and any other matters that the claimant feels are pertinent. In connection with the request for review, the claimant (or representative) has the right to review and obtain copies of all documents and other information relevant to the claim, upon request and at no charge, and to submit written comments, documents, records and other information relating to his or her claim. The review shall take into account all comments, documents, records and other information submitted by the claimant (or representative) relating to the claim, without regard to whether such information was submitted or considered in the initial benefit determination. The appeals official will provide written notice of its decision on review within 60 days after it receives a review request. If special circumstances require an extension of time (up to 60 days), written notice of the extension will be given to the claimant (or representative) within the initial 60-day period. This notice of extension will indicate the special circumstances requiring the extension of time and the date by which the appeals official expects to render its decision. If the extension is provided due to a claimant's failure to provide sufficient information, the time frame for rendering the decision on review is tolled from the date the notification is sent to the claimant about the failure to the date on which the claimant responds to the request for additional information. If the claim is denied (in full or in part) upon review, the claimant will be provided a written notice explaining the specific reasons for the denial and referring to the provisions of the Plan on which the denial is based. The notice shall also include a statement that the claimant will be provided, upon request and free of charge, reasonable access to, and copies of, all documents and other information

relevant to the claim and a statement regarding the claimant's right to bring an action under Section 502(a) of ERISA. The Plan Administrator has delegated the appeals review responsibility to the Company's General Counsel, except in the case of an appeal filed by or on behalf of the Company's General Counsel, in which case, the appeal will be reviewed by the Company's Chief Executive Officer.

Section 7. JUDICIAL PROCEEDINGS.

No judicial proceeding shall be brought to recover benefits under the Plan until the claims procedures described in Sections 5 and 6 have been exhausted and the Plan benefits requested have been denied in whole or in part. If any judicial proceeding is undertaken to further appeal the denial of a claim or bring any other action under ERISA (other than a breach of fiduciary duty claim), the evidence presented shall be strictly limited to the evidence timely presented to the Plan Administrator or its delegate, unless any new evidence has since been uncovered following completion of the claims procedures described in Sections 5 and 6. In addition, any such judicial proceeding must be filed within one year after the claimant's receipt of notification that his or her appeal was denied.

Section 8. GENERAL PROVISIONS.

8.1 Except as otherwise provided herein or by law, no right or interest of any Eligible Employee under the Plan shall be assignable or transferable, in whole or in part, either directly or by operation of law or otherwise, including without limitation by execution, levy, garnishment, attachment, pledge or in any manner; no attempted assignment or transfer thereof shall be effective; and no right or interest of any Eligible Employee under the Plan shall be liable for, or subject to, any obligation or liability of such Eligible Employee. When a payment is due under this Plan to a severed employee who is unable to care for his or her affairs, payment may be made directly to his or her legal guardian or personal representative.

8.2 Neither the establishment of the Plan, nor any modification thereof, nor the creation of any fund, trust or account, nor the payment of any benefits shall be construed as giving any Eligible Employee, or any person whomsoever, the right to be retained in the service of the Company or any subsidiary thereof, and all Eligible Employees shall remain subject to discharge to the same extent as if the Plan had never been adopted.

8.3 If any provision of this Plan shall be held invalid or unenforceable, such invalidity or unenforceability shall not affect any other provisions hereof, and this Plan shall be construed and enforced as if such provisions had not been included.

8.4 This Plan shall inure to the benefit of and be binding upon the heirs, executors, administrators, successors and assigns of the parties, including each Eligible Employee, present and future, and any successor to the Company. If an Eligible Employee dies while any amount would still be payable to such Eligible Employee hereunder (following a Qualifying Termination), all such amounts, unless otherwise provided herein, shall be paid in accordance with the terms of this Plan to the executor, personal representative or administrators of the severed employee's estate.

8.5 The headings and captions herein are provided for reference and convenience only, shall not be considered part of the Plan, and shall not be employed in the construction of the Plan.

8.6 The Plan shall not be required to be funded unless such funding is authorized by the Board. Regardless of whether the Plan is funded, no Eligible Employee shall have any right

to, or interest in, any assets of any Company which may be applied by the Company to the payment of benefits or other rights under this Plan.

8.7 Any notice or other communication required or permitted pursuant to the terms hereof shall have been duly given when delivered or mailed by United States Mail, first class, postage prepaid, addressed to the intended recipient at his, her or its last known address.

8.8 The provisions of the Plan will be construed, administered and enforced in accordance with ERISA. To the extent not preempted by ERISA or other applicable federal law, which shall otherwise control, this Plan shall be construed and enforced according to the laws of the State of Delaware, without regard to its choice-of-law principles.

8.9 The Company hereby agrees to indemnify and hold harmless the officers and employees of the Company, and the members of its boards of directors, from all losses, claims, costs or other liabilities arising from their acts or omissions in connection with the administration, amendment or termination of the Plan, to the maximum extent permitted by applicable law. This indemnity will cover all such liabilities, including judgments, settlements and costs of defense. The Company will provide this indemnity from its own funds to the extent that insurance does not cover such liabilities. This indemnity is in addition to and not in lieu of any other indemnity provided to such person by the Company.

8.10 All benefits hereunder shall be reduced by applicable withholding and shall be subject to applicable tax reporting, as determined by the Plan Administrator.

Section 9. NOTICE.

Except as expressly provided otherwise herein, any notice, demand, consent, authorization or other communication that any Eligible Employee is required or may desire to give to or make upon the Company pursuant to the Plan shall be in writing and shall be effective, valid and duly given and received if hand delivered or sent by overnight delivery service, by facsimile, computer mail or other electronic mail, or by regular mail, postage prepaid, addressed to:

Lyell Immunopharma, Inc.
Attention: General Counsel
201 Haskins Way
South San Francisco, CA 94080
E-mail: hturner@lyell.com

Notice so given shall be deemed given and received if (a) by mail, on the fourth day after posting; (b) by facsimile, computer mail or other electronic mail or personal delivery, on the date of actual transmission, with evidence of transmission acceptance or verification, or (as the case may be) personal or other delivery; and (c) by overnight delivery courier, on the next business day following the day such notice is delivered to the overnight delivery courier service.

Section 10. ADDITIONAL INFORMATION.

Plan Name:	Lyell Immunopharma, Inc. Officer Severance Plan
Plan Sponsor:	Lyell Immunopharma, Inc. 201 Haskins Way South San Francisco, California 94080 (650) 695-0677
Identification Numbers:	EIN: 83-1300510
Plan Year:	Company's Fiscal Year ending December 31
Plan Administrator:	Lyell Immunopharma, Inc. 201 Haskins Way South San Francisco, California 94080 (650) 695-0677
Agent for Service of Legal Process:	Lyell Immunopharma, Inc. General Counsel 201 Haskins Way South San Francisco, California 94080 (650) 695-0677 Service of process may also be made upon the Plan Administrator.
Type of Plan:	Severance Plan/Employee Welfare Benefit Plan
Plan Costs:	The cost of the Plan is paid by the Employer.

Section 11. STATEMENT OF ELIGIBLE EMPLOYEE ERISA RIGHTS.

As an Eligible Employee under the Plan, you have certain rights and protections under ERISA:

(a) You may examine (without charge) all Plan documents, including any amendments and copies of all documents filed with the U.S. Department of Labor. These documents are available for your review in the Company's Human Resource Department.

(b) You may obtain copies of all Plan documents and other Plan information upon written request to the Plan Administrator at no charge.

In addition to creating rights for Eligible Employees, ERISA imposes duties upon the people who are responsible for the operation of the Plan. The people who operate the Plan (called "fiduciaries") have a duty to do so prudently and in the interests of you and the other Eligible Employees. No one, including the Company or any other person, may fire you or otherwise discriminate against you in any way to prevent you from obtaining a benefit under the Plan or exercising your rights under ERISA. If your claim for a severance benefit is denied, in whole or in part, you have a right to know why this was done, to obtain copies of documents relating to the decision without charge, and to appeal any denial, all within certain time schedules. (The claim review procedure is explained in Section 5 and Section 6 above.)

Under ERISA, there are steps you can take to enforce the above rights. For instance, if you request a copy of Plan documents and do not receive them within thirty days, you may file suit in a federal court. In such a case, the court may require the Plan Administrator to provide the materials and to pay you up to $110 a day until you receive the materials, unless the materials were not sent because of reasons beyond the control of the Plan Administrator. If you have a claim which is denied or ignored, in whole or in part, you may file suit in a federal court. If it should happen that you are discriminated against for asserting your rights, you may seek assistance from the U.S. Department of Labor, or you may file suit in a federal court. The court will decide who should pay court costs and legal fees. If you are successful, the court may order the person you have sued to pay these costs and fees. If you lose, the court may order you to pay these costs and fees, for example, if it finds your claim is frivolous.

If you have any questions regarding the Plan, please contact the Plan Administrator or the Company's General Counsel. If you have any questions about this statement or about your rights under ERISA, you may contact the nearest office of the Employee Benefits Security Administration, U.S. Department of Labor, listed in your telephone directory, or the Division of Technical Assistance and Inquiries, Employee Benefits Security Administration, U.S. Department of Labor, 200 Constitution Avenue, N.W. Washington, D.C. 20210. You may also obtain certain publications about your rights and responsibilities under ERISA by calling the publications hotline of the Employee Benefits Security Administration at 1-866-444-3272.

SCHEDULE A
SCHEDULE OF SEVERANCE BENEFITS

1. If the Qualifying Termination occurs other than during the Change in Control Protection Period, the Severance Pay and Severance Period are as set forth in the table below.

Eligible Employee Tier Level	Severance Pay	Severance Period*
Tier I	12 months base salary and a pro-rated annual bonus for the year in which the termination of employment occurs (paid at target in proportion to the percentage of that year in which employed by the Company)	12 months
Tier II	9 months base salary	9 months
Tier III	6 months base salary	6 months

*Commences on the day immediately after the Termination Date

2. If the Qualifying Termination occurs during the Change in Control Protection Period, the Severance Pay, Severance Period, and Vesting Acceleration percentage are as follows:

Eligible Employee Tier Level	Severance Pay	Severance Period*	Vesting Acceleration Percentage
Tier I	12 months base salary, and any guaranteed or accrued bonus as of the Termination Date, and 100% of annual target bonus for year in which termination of employment occurs	12 months	100%
Tier II	12 months base salary and any guaranteed or accrued bonus as of the Termination Date	12 months	100%
Tier III	9 months base salary and any guaranteed or accrued bonus as of the Termination Date	9 months	100%

*Commences on the day immediately after the Termination Date

ANNEX A
RELEASE AND SEPARATION AGREEMENT

This Release and Separation Agreement (this "Agreement") is made and entered into by and between Lyell Immunopharma, Inc. (the "Company"), and the undersigned employee ("Employee"). All capitalized terms used in this Agreement that are not defined herein shall have the same respective meanings as set forth in the Lyell Immunopharma, Inc. Officer Severance Plan, effective July 29, 2019, and amended and restated as of [____], 2022 (the "Severance Plan").

RECITALS

WHEREAS, Employee's employment with the Company terminates effective as of [Termination Date];

WHEREAS, the Company presented Employee with this Agreement on [_____], 20[___] (the "Presentation Date");

WHEREAS, the Parties wish to resolve fully and finally any and all matters between them including any potential disputes regarding Employee's employment with the Company or the termination thereof; and

WHEREAS, in order to accomplish this end, the Parties wish to enter into this Agreement.

NOW, THEREFORE, in consideration of the mutual promises and undertakings contained herein and for other good and valuable consideration, including the consideration described in Section 3 of this Agreement, the sufficiency of which is hereby acknowledged, the Parties hereto agree as follows:

1. Separation and Effective Date. Employee's last day of employment with the Company was [_____] (the "Separation Date"). [This Agreement shall become effective as of the execution date/This Agreement shall not become effective until the eighth (8th) day after Employee signs this Agreement without having exercised any legal right to revoke this Agreement prior to such date][1] (the "Effective Date"). No payments due to Employee under this Agreement shall be made or begin before the Effective Date.

2. Wage Acknowledgment. Employee acknowledges that, as of the Separation Date, Employee has been properly paid all wages, including bonus or incentive compensation, for all work performed for the Company.

3. Consideration.

   a. In exchange for Employee timely signing and returning the Agreement to the Company [(and allowing the releases contained herein to become effective)][2], in each case following the Presentation Date, the release of claims in Section 4 below, the Company will provide Employee with the following amounts and benefits (the "Release Consideration"):

[1] Note to Draft: If the employee is under 40, the Agreement is effective as of the day s/he signs. If the employee is over 40, s/he has 7 days to revoke the agreement.
[2] Note to Draft: Only include for employees age 40+.

i. [[INSERT SEVERANCE PAYMENT], less applicable taxes, withholdings and deductions (the "Cash Severance Payment"), to which Employee is not otherwise entitled, pursuant to the applicable timing set forth in Section 2.3 of the Plan]; and

ii. if Employee is eligible for and timely elects group health plan continuation coverage under COBRA, upon Employee's submission to the Company of evidence of Employee's and Employee's dependents, if applicable, enrollment in COBRA, the Company will pay a portion of the Employee's premiums for the Employee and the Employee's dependents to continue group medical, vision and dental coverage under COBRA directly to the insurer or COBRA administrator, as applicable, until the earliest of: (A) the date that is [____] months following the Separation Date, (B) the date on which Employee and Employee's eligible dependents, if applicable, become covered by the group health plan of a subsequent employer and (C) the expiration of Employee's eligibility for continuation coverage under COBRA (the earliest of clauses (A), (B), and (C) the "COBRA Payment Period"). The amount of this portion will be the same portion of the premium cost as was borne by the Company under the level of coverage selected by Employee and in effect on the Separation Date. The period of continued benefits under this paragraph shall run concurrently with (and shall count against) the Company's obligation to provide continuation coverage pursuant to COBRA.

Notwithstanding the foregoing, if at any time the Company determines, in its sole discretion, that it cannot provide the COBRA premium benefits above without potentially incurring financial costs or penalties under applicable law (including, without limitation, Section 2716 of the Public Health Service Act), then in lieu thereof, the Company will pay Employee on the last day of each remaining month of the COBRA Payment Period a fully taxable cash payment equal to the monthly portion of the premium cost for group medical, vision and dental coverage as was borne by the Company under the level of coverage selected by Employee and in effect on the Separation Date, subject to applicable tax withholding (such amount, the "Special Severance Payment"), provided that any Special Severance Payments that otherwise would be payable prior to or on the Effective Date shall be paid in a single lump sum on the first regularly scheduled payroll date of the Company following the Effective Date, and any remaining Special Severance Payments will be paid in accordance with the schedule described above. Any Special Severance Payments will be made regardless of whether Employee elects COBRA continuation coverage.

iii. [one-hundred percent (100%) of Employee's unvested equity awards outstanding as of the Separation Date which would otherwise become vested solely on the passage of time and Employee's continued service to the Company (which, for the avoidance of doubt will not include any such Company equity awards that would otherwise become vested in whole or in part based on the attainment of performance conditions or targets, which awards will be subject to the terms of their underlying award agreements) shall become vested in full, and to the extent applicable, become immediately exercisable on the Effective Date.][3]

[3] Note to Draft: Exclude this provision if the individual is not entitled to vesting acceleration under the Plan.

b. Employee understands, acknowledges, and agrees that these benefits exceed what Employee is otherwise entitled to receive upon Employee's separation from employment with the Company, and are being given as consideration in exchange for executing this Agreement, including the general release contained herein.

c. Employee Representations. Employee specifically represents, warrants, and confirms that Employee: has read this Agreement and agrees to the conditions and obligations set forth in it; has been advised to consult with an attorney of Employee's choosing before signing this Agreement; has been advised, as required by California Government Code Section 12964.5(b)(4) that Employee has a right to consult an attorney regarding this Agreement and that Employee was given a reasonable time period not less than five (5) business days to do so; knowingly, freely, and voluntarily assents to all of this Agreement's terms and conditions including, without limitation, the waiver, release, and covenants; is signing this Agreement, including the waiver and release, in exchange for good and valuable consideration in addition to anything of value to which Employee is otherwise entitled; is not waiving or releasing rights or claims that may arise after Employee signs this Agreement; has not filed any claims, complaints, or actions of any kind against the Company with any court of law, or local, state, or federal government or agency; and has not engaged in and is not aware of any unlawful conduct relating to the business of the Company.

4. General Release.

a. In exchange for the Release Consideration provided in this Agreement, Employee, for Employee and for Employee's affiliates, successors, heirs, subrogees, assigns, principals, agents, partners, employees, associates, attorneys, and representatives, voluntarily, knowingly, and intentionally releases and discharges the Company, Parent, and each of its and their Affiliates, predecessors, successors, parents, subsidiaries, and assigns, and each of its and their respective officers, directors, principals, shareholders, board members, committee members, insurers, employees, agents, and attorneys, in their corporate and individual capacities, (collectively, the "Released Parties") from any and all claims, actions, liabilities, demands, rights, damages, costs, expenses, and attorneys' fees (including, but not limited to, any claim of entitlement for attorneys' fees under any contract, statute, or rule of law allowing a prevailing party or plaintiff to recover attorneys' fees) of every kind and description, whether known or unknown, from the beginning of time through the Effective Date (the "Released Claims").

b. The Released Claims include, but are not limited to,

i. Any and all claims under Title VII of the Civil Rights Act of 1964 (Title VII), the Americans with Disabilities Act (ADA), the Family and Medical Leave Act (FMLA) (regarding existing but not prospective claims), the Fair Labor Standards Act (FLSA), the Equal Pay Act, the Employee Retirement Income Security Act (ERISA) (regarding unvested benefits), the Civil Rights Act of 1991, Section 1981 of U.S.C. Title 42, the Fair Credit Reporting Act (FCRA), the Worker Adjustment and Retraining Notification (WARN) Act, the National Labor Relations Act (NLRA), the Age Discrimination in Employment Act (ADEA), the Uniform Services Employment and Reemployment Rights Act (USERRA), the Genetic Information Nondiscrimination Act (GINA), the Immigration Reform and Control Act (IRCA), the California Fair Employment and Housing Act, the California Constitution, the California Labor Code, any claim under

Title 20 of the State Government Article of the Maryland Annotated Code, the Washington Industrial Welfare Act (IWA), the Washington Law Against Discrimination (WLAD), the Washington Family Leave Act (FLA), the Washington Leave Law, the Washington Minimum Wage Requirements and Labor Standards Act, Title 49 of the Revised Code of Washington, the Washington Equal Pay Opportunity Act (EPOA), the Washington Fair Chance Act (FCA), and including all of their respective implementing regulations and any other federal, state, local or foreign law (statutory, regulatory, or otherwise) that may be legally waived and released; however, the identification of specific statutes is for purposes of example only, and the omission of any specific statute or law shall not limit the scope of this general release in any manner;

ii. Any and all claims arising under tort, contract, and quasi-contract law, including but not limited to claims of breach of an express or implied contract, wrongful or retaliatory discharge, fraud, defamation, negligent or intentional infliction of emotional distress, tortious interference with a contract or prospective business advantage, breach of the covenant of good faith and fair dealing, promissory estoppel, detrimental reliance, invasion of privacy, false imprisonment, nonphysical injury, personal injury or sickness, or any other harm;

iii. Any and all claims for compensation of any type whatsoever, including but not limited to claims for wages, salary, bonuses, commissions, incentive compensation, vacation, sick pay, and severance that may be legally waived and released; and

iv. Any and all claims for monetary or equitable relief, including but not limited to attorneys' fees, back pay, front pay, reinstatement, experts' fees, medical fees or expenses, costs and disbursements, punitive damages, liquidated damages, and penalties.

Notwithstanding the foregoing, the Released Claims [and the ADEA Release in Section 6 (below)] specifically exclude: (i) any rights to workers' compensation, unemployment, or disability benefits under applicable law; (ii) any rights to file an unfair labor practice charge under the National Labor Relations Act; (iii) any rights to vested benefits under ERISA, such as pension or retirement benefits, the rights to which are governed by the terms of the applicable plan documents and award agreements; (iv) any right to file an administrative charge or complaint with, or testify, assist, or participate in an investigation, hearing, or proceeding conducted by, the Equal Employment Opportunity Commission, or other similar federal or state administrative agencies; (v) any rights based on any violation of any federal, state, or local statutory or public policy entitlement that may not be waived under applicable law, such as claims for unemployment benefits and workers' compensation; (vi) any rights to indemnification, advancement, or contribution; and (vi) any claim that is based on any act or omission that occurs after the date Employee delivers Employee's signature on this Agreement to the Company.

5. Waiver of Section 1542. This Agreement is intended to be effective as a general release of and bar to all claims as stated in Section 4. Accordingly, Employee expressly waives all rights under Section 1542 of the California Civil Code ("Section 1542") or any similar statute or common law doctrine under applicable law in any other jurisdiction. Section 1542 states as follows: "A GENERAL RELEASE DOES NOT EXTEND TO CLAIMS THAT THE CREDITOR OR RELEASING PARTY DOES NOT KNOW OR SUSPECT TO EXIST IN HIS OR HER FAVOR AT THE TIME OF EXECUTING THE RELEASE

AND THAT, IF KNOWN BY HIM OR HER, WOULD HAVE MATERIALLY AFFECTED HIS OR HER SETTLEMENT WITH THE DEBTOR OR RELEASED PARTY." Employee acknowledges that Employee may later discover claims or facts in addition to or different from those that Employee now knows or believes to exist with regard to the subject matter of this Agreement, and that, if known or suspected at the time of executing this Agreement, may have materially affected its terms. Nevertheless, Employee waives any and all claims that might arise as a result of such different or additional claims or facts.

6. [Specific Release and Waiver of ADEA Claims. In further consideration of the payments and benefits provided to Employee in this Agreement, Employee irrevocably and unconditionally fully and forever waives, releases, and discharges the Company from any and all claims, whether known or unknown, from the beginning of time through the date of Employee's execution of this Agreement arising under the Age Discrimination in Employment Act ("ADEA") (the "ADEA Release"), as amended, and its implementing regulations. By signing this Agreement, Employee acknowledges and confirms that:

   a. Employee has read this Agreement in its entirety and understands all of its terms;

   b. Employee has been advised in writing to consult with an attorney of Employee's choosing before signing this Agreement;

   c. Employee knowingly, freely, and voluntarily agrees to all of the terms and conditions in this Agreement including, without limitation, the waiver, release, and covenants;

   d. Employee is signing this Agreement, including the waiver and release, in exchange for good and valuable consideration in addition to anything of value to which Employee is otherwise entitled;

   e. Employee was given at least [twenty-one (21)/forty-five (45)][4] days to consider the terms of this Agreement and consult with an attorney of Employee's choice, although Employee may sign it sooner if desired;

   f. Employee understands that Employee has seven (7) days after signing this Agreement to revoke the release in this Section by delivering written notice of revocation to [NAME] at the Company, [ADDRESS] by [electronical mail or First Class mail] before the end of the seven (7) day period; and

   g. Employee understands that the release in this Section does not apply to rights and claims that may arise after Employee signs this Agreement.][5]

   [specific information required to be provided to Employee under ADEA in connection with a group termination program is attached as Exhibit A.][6]

7. No Admission of Liability. Nothing in this Agreement constitutes an admission of liability by the Company, any of the Released Parties or Employee concerning any aspect of Employee's employment with or separation from the Company.

[4] Note to Draft: Employees age 40+ must be given 21 days to sign. If the employee is entering into this agreement in connection with a group termination (which may be as few as two or more employees), s/he must be given 45 days to sign.
[5] Note to Draft: Include this section only for employees age 40+.
[6] Note to Draft: Include this language only for a group termination.

8. Return of Property and Information. Employee represents and warrants that, prior to Employee's execution of this Agreement, Employee will return to the Company any and all property, documents, and files, work product, including any documents (in any recorded media, such as papers, computer disks and other data storage devices, copies, photographs, and maps) that relate in any way to the Company or the Company's business. Employee agrees that, to the extent that Employee possesses any files, data, work product, or information relating in any way to the Company or the Company's business on any personal computer, device, or account, Employee will return to the Company and then delete those files, data, or information (and will retain no copies in any form). Employee also will return any tools, equipment, calling cards, credit cards, access cards or keys, any keys to any filing cabinets, vehicles, vehicle keys, and all other property in any form prior to the date Employee executes this Agreement.

9. Cooperation. Employee agrees that after the Separation Date, Employee will reasonably cooperate with and assist the Company (a) to transition Employee's job duties on an as-needed basis by responding to reasonable requests for information and answering questions, and (b) with any investigation, lawsuit, arbitration, or other proceeding to which the Company is subjected. Employee will make himself or herself available for preparation for, and attendance of, hearings, proceedings or trial, including pretrial discovery and trial preparation. Employee further agrees to perform all acts and execute any documents that may be necessary to carry out the provisions of this Section 9.

10. Nondisparagement. Employee agrees not to disparage the Company, its officers, directors, employees, shareholders, parents, subsidiaries, affiliates, and agents, in any manner likely to be harmful to its or their business, business reputation, or personal reputation; provided however that:

    a. Employee may respond accurately and fully to any request for information if required by legal process or in connection with a government investigation.

    b. This provision and this Agreement do not prohibit or restrain Employee in any manner from making disclosures protected under the whistleblower provisions of federal or state law or regulation or other applicable law or regulation.

    c. This provision and this Agreement do not limit Employee's ability to file a charge or complaint with the Equal Employment Opportunity Commission, the Department of Labor, the National Labor Relations Board, the Occupational Safety and Health Administration, the California Department of Fair Employment and Housing, the Securities and Exchange Commission or any other federal, state or local governmental agency or commission ("Government Agencies").

    d. This provision and this Agreement do not limit Employee's ability to communicate with any Government Agencies or otherwise participate in any investigation or proceeding that may be conducted by any Government Agency, including providing documents or other information, without notice to the Company.

    e. This provision and this Agreement do not limit Employee's right to receive an award for information provided to the Securities and Exchange Commission; however, Employee understands and agrees that, to maximum extent permitted by law, Employee is otherwise waiving any and all rights Employee may have to individual relief based on any claims that Employee has released and any rights Employee has waived by signing this Agreement.

f. This provision and this Agreement do not prohibit Employee from discussing or disclosing information about unlawful acts in the workplace, such as harassment or discrimination or any other conduct that Employee has reason to believe is unlawful.

11. Employee Invention Assignment and Confidentiality Agreement. Employee acknowledges and reaffirms Employee's continuing obligations under the Employee Invention Assignment and Confidentiality Agreement (the "Confidentiality Agreement") between Employee and the Company, which is incorporated herein by reference.

12. Section 409A. It is intended that payments and benefits under this Agreement not subject Employee to taxation under Section 409A of the Internal Revenue Code of 1986, as amended (the "Code") and, accordingly, this Agreement shall be interpreted and administered to be in compliance therewith. Any payments described in this Agreement that are due within the "short term deferral period" as defined in Section 409A of the Code, or that qualify as "involuntary separation pay" within the meaning of Treas. Reg. §1.409A-1(b)(9) shall not be treated as deferred compensation unless applicable law requires otherwise. To the extent required to avoid an accelerated or additional tax under Section 409A, amounts reimbursable to Employee under this Agreement shall be paid to Employee on or before the last day of the calendar year following the calendar year in which the expense was incurred and the amount of expenses eligible for reimbursement during any one calendar year may not effect amounts reimbursable or provided in any subsequent calendar year. Notwithstanding anything herein to the contrary, in no event shall the timing of Employee's execution of the release described in Section 4, directly or indirectly, result in the Employee designating the calendar year of payment, and if a payment that is subject to execution of the general release could be made in more than one taxable year, payment shall be made in the later taxable year. No interpretation or amendment of this Agreement shall require the Company to incur any additional costs or to reimburse Employee for any taxes or penalties that might be imposed upon the Employee as a result of Section 409A of the Code.

13. Severability. If any provision of this Agreement is held illegal, invalid, or unenforceable, such holding shall not affect the validity of any other provisions hereof, which shall remain in full force and effect to continue to be binding on the Parties. In the event any provision is held illegal, invalid, or unenforceable, such provision shall be limited so as to affect the intent of the Parties to the fullest extent permitted by applicable law. Any claim by Employee against the Company shall not constitute a defense to enforcement by the Company.

14. Successors and Assigns. Except as otherwise provided in this Agreement, this Agreement, and the rights and obligations of the parties hereunder, will be binding upon and inure to the benefit of their respective successors, assigns, heirs, executors, administrators and legal representatives. The Company may assign any of its rights and obligations under this Agreement. The Employee shall not assign, whether voluntarily or by operation of law, any of its rights and obligations under this Agreement, except with the prior written consent of the Company.

15. Third Party Beneficiaries. The Parties acknowledge and agree that each of the Released Parties, including, but not limited to, Parent and each of its Affiliates, is an intended third-party beneficiary of this Agreement and has the right to enforce and benefit from any legal or equitable right, benefit, or remedy of any nature whatsoever under or by reason of this Agreement.

16. Entire Agreement. This Agreement constitutes the entire agreement among the Parties with respect to the subject matter hereof and thereof and supersedes any prior understandings, agreements or representations by or between the Parties, written or oral, to the extent that they are related in any way to the subject matter hereof or thereof, provided, however, that this Agreement shall not supersede the Employee's obligations in the Employee's Employment, Confidential Information and Invention Assignment Agreement with the Company, except to the extent that there is a conflict between such agreement and this Agreement, in which case the terms and conditions of this Agreement shall govern.

17. Governing Law; Jurisdiction. This Agreement will be governed by and construed in accordance with the laws of the state of the Employee's residence on the Effective Date, without giving effect to its laws pertaining to conflict of laws. If any court or arbitrator of competent jurisdiction determines that any provision of this Agreement is invalid, illegal or unenforceable in any respect, such provision will be enforced to the maximum extent possible given the intent of the parties hereto. If such clause or provision cannot be so enforced, such provision shall be stricken from this Agreement and the remainder of this Agreement shall be enforced as if such invalid, illegal or unenforceable clause or provision had (to the extent not enforceable) never been contained in this Agreement.

18. Amendment and Waiver. This Agreement may be amended only by a written agreement executed by each of the parties hereto. No amendment, waiver, or modification of any obligation under this Agreement will be enforceable unless set forth in a writing signed by the party against which enforcement is sought. Any amendment effected in accordance with this section will be binding upon all parties hereto and each of their respective successors and assigns. No delay or failure to require performance of any provision of this Agreement shall constitute a waiver of that provision as to that or any other instance. Waiver granted as to any one provision herein shall not constitute a subsequent waiver of such provision or of any other provision herein, nor shall it constitute the waiver of any performance other than the actual performance specifically waived.

19. Counterparts. This Agreement may be executed electronically. The Agreement may be executed in any number of counterparts, each of which when so executed and delivered will be deemed an original, and all of which together shall constitute one and the same agreement. Photographic, computerized, electronic, PDF or facsimile copies of such signed counterparts may be used in lieu of the originals for any purpose.

20. Acknowledgment of Full Understanding. EMPLOYEE ACKNOWLEDGES AND AGREES THAT EMPLOYEE HAS FULLY READ, UNDERSTANDS, AND VOLUNTARILY ENTERS INTO THIS AGREEMENT. EMPLOYEE ACKNOWLEDGES AND AGREES THAT EMPLOYEE HAS HAD AN OPPORTUNITY TO ASK QUESTIONS AND CONSULT WITH AN ATTORNEY OF EMPLOYEE'S CHOICE BEFORE SIGNING THIS AGREEMENT. EMPLOYEE FURTHER ACKNOWLEDGES THAT EMPLOYEE'S SIGNATURE BELOW IS AN AGREEMENT TO RELEASE THE COMPANY FROM ANY AND ALL CLAIMS THAT CAN BE RELEASED AS A MATTER OF LAW.

IN WITNESS WHEREOF, the Parties have entered into this Separation and Release of Claims Agreement on the date first above written.

Lyell Immunopharma, Inc.

By:__
Name:
Title:

EMPLOYEE:

__
Name:
Date:

[Signature Page to Separation and Release of Claims Agreement]

Exhibit A

OWBPA Disclosures to General Release in Separation and Release Agreement

The Older Workers Benefit Protection Act (OWBPA) requires that employers provide specific information to employees who are 40 years of age or older and asked to execute a release of claims in connection with a group termination program. This document provides this information.

The class, unit, or group of individuals covered by the program includes [all employees/[SPECIFIC EMPLOYEE GROUP]] in the [OFFICE/DEPARTMENT/AREA] who will be [terminated/offered an exit incentive] [ANY TIME LIMITS APPLICABLE TO THE PROGRAM]. [All employees/[SPECIFIC EMPLOYEE GROUP]] in the [OFFICE/DEPARTMENT/AREA] are eligible for the program. [Eligibility factors include [ANY ELIGIBILITY FACTORS].] The following is a list of the ages and job titles of employees who were and were not selected for termination and offered consideration for signing a waiver:

JOB TITLE	AGE	SELECTED	NOT SELECTED

CERTAIN INFORMATION CONTAINED IN THIS DOCUMENT, MARKED BY [*], HAS BEEN OMITTED BECAUSE IT IS BOTH NOT MATERIAL AND IS THE TYPE THAT THE REGISTRANT TREATS AS PRIVATE OR CONFIDENTIAL.

Second Amendment
to the
Collaboration and License Agreement
between
Lyell Immunopharma, Inc.
and
GlaxoSmithKline Intellectual Property (No.5) Limited [*]

This Second Amendment to the Collaboration and License Agreement (the "**Second Amendment**") is dated as of 16th December 2021 (the "**2nd Amendment Effective Date**"), by and between Lyell Immunopharma, Inc. having a principal office at 201 Haskins Way, South San Francisco, California 94080, USA ("**Lyell**") and GlaxoSmithKline Intellectual Property (No.5) Limited, a company registered in England and Wales (registered number 11959399) with a registered office at 980 Great West Road, Brentford, Middlesex TW8 9GS, United Kingdom ("**GSK**"). Lyell and GSK are sometimes referred to herein individually as a "**Party**" and collectively as the "**Parties**").

BACKGROUND

WHEREAS, the Parties entered into that certain Collaboration and License Agreement governing the research, development and commercialization of human therapeutic products dated May 23, 2019 (the "**Collaboration Agreement**"), as amended June 25, 2020 (the "**First Amendment**") (collectively, the "**Agreement**");

WHEREAS, Lyell and GSK desire to amend the Agreement with respect to the Gen-R Component Development Program (as defined below);

WHEREAS, Lyell and GSK desire to amend the Agreement to add provisions governing the Parties' rights and obligations with respect to, among other things, Epi-R and the Epi-R NY-ESO Program (each as defined below), including matters unique to Epi-R and the Epi-R NY-ESO Program that are not currently addressed in the Agreement; and

WHEREAS, GSK and Lyell wish to amend the Agreement in accordance with Section 17.1 to enable the foregoing.

NOW, THEREFORE, IN CONSIDERATION OF the mutual covenants set forth in this Agreement, and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties hereby agree as follows:

1. All terms and conditions of the Agreement not modified by this Second Amendment shall continue in full force and effect in accordance with their terms. All capitalized terms not otherwise defined herein shall have the same definition as in the Agreement.

2. **Section 1.92 "Senior Executives"**. Section 1.92 "**Senior Executives**" is hereby deleted and replaced in its entirety with the following:

"1.92 "**Senior Executives**" means, in the case of GSK, [*], and in the case of Lyell, [*]."

3. **Section 1.108 Additional Definitions**. Section 1.108 Additional Definitions is hereby renumbered as Section 1.126 Additional Definitions.

4. **Article 1 DEFINITIONS**. Article 1 DEFINITIONS is hereby amended to add the following definitions:

"1.108 "**Epi-R**" means [*]"

"1.109 "**Epi-R Component Development Program"** means the Lyell Component Development Program pursuant to which Lyell is incorporating Epi-R with the lete-cel Underlying NY-ESO Product and collaborating with GSK to enable GSK to Develop the Epi-R NY-ESO Product through Epi-R NY-ESO Phase 1 Completion."

"1.110 [*]

"1.111 "**Epi-R NY-ESO Phase 1 Clinical Trial**" means the Phase 1 Clinical Trial of the Epi-R NY-ESO Product to be agreed by the JSC and conducted by GSK."

"1.112 "**Epi-R NY-ESO Phase 1 Completion**" means receipt by GSK of cleaned safety and efficacy data from that number of Evaluable Patients as agreed by the JSC at the recommended phase 2 dose of the Epi-R NY-ESO Product, where such safety and efficacy data is identified in the protocol or by the JSC to be collected, up to and including the [*] at a minimum. For purposes of this definition, "cleaned" means the data have been monitored and queried, and that the queries have been resolved to a level acceptable to GSK."

"1.113 "**Epi-R NY-ESO Product**" refers to a T-Cell Therapy engineered to express the NY-ESO TCR using the vector for the lete-cel Underlying NY-ESO Product and [*] Epi- R."

"1.114 "**Epi-R NY-ESO Program**" means a TCR Program which is [*], consisting of (a) the Epi-R Component Development Program, and (b) a GSK Development Program for developing any NY-ESO Epi-R TCR Product (such GSK Development Program referred to herein as the "**Epi-R GSK Development Program**")."

"1.115 "**Gen-R**" means an Anti-Exhaustion Component that [*]

"1.116 "**Gen-R Development Program"** means the GSK Development Program with respect to the Gen-R NY-ESO Product that is ongoing as of the 2nd Amendment Effective Date, following GSK's delivery of its Option Exercise notice on [*]."

"1.117 "**Gen-R NY-ESO Product**" refers to a T-Cell Therapy engineered to express an NY-ESO TCR that includes Gen-R."

"1.118 "**GSK Licensed Patents**" means GSK Patents that are necessary to make, use, sell, offer to sell, import and otherwise exploit for any purpose Anti-Exhaustion Components provided to GSK by Lyell under a Collaboration Program.

1.119 "**Joint Patents**" means any Patent that claims a Joint Invention."

"1.120 "**Joint Technology**" means Joint Inventions and Joint Patents."

"1.121 "**NY-ESO Component Product**" refers to any T-Cell Therapy engineered to express an NY-ESO TCR that includes or uses either or both Epi-R or Gen-R, or any other Anti-Exhaustion Component licensed from Lyell under this Agreement, that is Developed or Commercialized by GSK pursuant to a GSK Development Program hereunder, whether or not the specific T-Cell Therapy was the subject of the corresponding Lyell Development Program."

"1.122 "**NY-ESO Epi-R TCR Product**" refers to a T-Cell Therapy engineered to express the NY-ESO TCR and processed with Epi-R, including T-Cells engineered with any of the vectors for the Underlying NY-ESO Products."

"1.123 "**Phase 1 Clinical Trial**" means a Clinical Trial satisfying the requirements of 21 C.F.R. 312.21(a) in the United States or the corresponding regulation in jurisdictions other than the United States."

"1.124 "**Sensitive Epi-R Information"** means the [*]"

"1.125 "**Underlying NY-ESO Product**" means any one or all of the following T-Cell Therapies, engineered to target the NY-ESO Initial Collaboration Target: (a) a T-Cell Therapy engineered to express the NY-ESO TCR, with the same TCR construct used for GSK3377794 (also referred to as "lete-cel") and/or (b) a T-Cell Therapy engineered to express the NY-ESO TCR, with the TCR constructs used for [*] and/or (c) the Gen-R NY-ESO Product.

5. **Section 1.126 Additional Definitions**. The following are hereby appended to the end of Section 1.126 Additional Definitions:

Definitions	Section		Definitions	Section
Base Royalty Rate	8.5(a)		**Epi-R NY-ESO Option Exercise**	3.1(b)(iv)
Clinical Plan	4.4(a)		**Epi-R Option Deliverable**	3.1(a)(vi)
Clinical Study Report	4.4(b)		**GSK Vector**	3.4.1
Data Sharing Plan	4.4(b)		**NY-ESO FTIH Master Protocol**	4.1(e)(i)
[*] Plan	6.5		**Product Supply Agreement**	6.2(c)
Epi-R NY-ESO Exercise Period	3.1(b)(iv)		**Quality Agreement**	6.2(c)
Epi-R NY-ESO Option	3.1(b)(iv)			

6. **Section 2.1(c) Role of the JSC.** Section 2.1(c) is hereby modified to add the following to the end of the section:

"In addition to the responsibilities of the JSC as set forth in this Section 2.1(c)(i) through (viii), the JSC is also responsible (itself or through delegation to a subcommittee or working group established by it) for the following activities as they relate to the Epi-R NY-ESO Program: (A) subject to Section 4.4(a), [*] for the Epi-R NY-ESO Phase 1 Clinical Trial, [*], and (B) if applicable, ensuring timely agreement on the [*].

7. **New Section 2.1(f) Additional Committees**. The following Section 2.1(f) is hereby appended to the end of Section 2.1:

"**2.1(f) Additional Committees**. From time to time, the JSC may establish subcommittees or working groups to oversee particular projects or activities under this Agreement, and such subcommittees or working groups shall be constituted and have such responsibility as the JSC approves; provided, that in no event will such subcommittees or working groups have authority to alter or amend the terms and conditions of this Agreement."

8. **New Section 3.1(a)(vi) Delivery of Epi-R Option Deliverable**. The following Section 3.1(a)(vi) is hereby appended to the end of Section 3.1(a):

"3.1(a)(vi) **Delivery of Epi-R Option Deliverable**. Notwithstanding the terms of Section 3.1(a)(v), within [*] after Epi-R NY-ESO Phase I Completion, Lyell shall deliver to GSK a detailed description of Epi-R, excluding the Sensitive Epi-R Information (the "**Epi-R Option Deliverable**"). For clarity, beyond providing the Epi-R Option Deliverable, the assistance

described in Sections 3.1(c) and 3.1(d), the provisions of Section 6.5 and the [*], unless otherwise mutually agreed by the Parties, Lyell shall not be responsible for providing further support for the Epi-R GSK Development Program, [*], providing GSK with ongoing supply of Anti-Exhaustion Components or Compounds or other ongoing support for the Epi-R GSK Development Program."

9. **Section 3.1(b)(iv) Option Trigger Exercise**. The following Section 3.1(b)(iv) is hereby appended to the end of Section 3.1(b):

"(iv) **Epi-R NY-ESO Option Trigger and Exercise**. Notwithstanding the terms of Section 3.1(b)(i), commencing at any time after the Epi-R NY-ESO Phase 1 Completion, GSK shall have the exclusive option to obtain the license provided in Section 7.1(a) for Epi-R for use as part of any NY-ESO Epi-R TCR Product (the "**Epi-R NY-ESO Option**"). To exercise such Epi-R NY-ESO Option (the "**Epi-R NY-ESO Option Exercise**"), GSK shall provide written notice indicating such Epi-R NY-ESO Option Exercise (which notice date shall be the effective date of such exercise, unless deferred until the HSR Clearance Date, if applicable, under Section 17.16(b)) to Lyell at any time ending [*] after Epi-R NY-ESO Phase 1 Completion and delivery by Lyell to GSK of the Epi-R Option Deliverables (the "**Epi-R NY-ESO Exercise Period**"); provided, however, that prior to GSK's exercise of the Epi-R NY-ESO Option, during the Epi-R NY-ESO Exercise Period Lyell shall (x) use Commercially Reasonable Efforts to disclose to GSK, or make available to GSK by granting to GSK designated personal access to a virtual data room, the Program Diligence Information described in **Exhibit 3.1(b)** within [*] after request by GSK, and (y) as reasonably requested by GSK, provide GSK with reasonable consultation and assistance to the extent necessary or reasonably useful for GSK to understand and conduct diligence on Epi-R, in a manner and on such timelines to enable GSK to make an informed decision in respect of the Epi-R NY-ESO Option."

10. **New Section 3.4.1 Responsibility for the Expenses for the Conduct of Epi-R NY-ESO Component Development Program**. The following Section 3.4.1 is hereby appended to the end of Section 3.4:

"**3.4.1 Responsibility for Expenses for Conduct of Epi-R NY-ESO Component Development Program**. Notwithstanding Section 3.4 above, with respect to the Epi-R NY-ESO Component Development Program, each of GSK and Lyell is responsible for their respective costs of undertaking activities within its area of responsibility, including as set forth in Section 4.1 and Section 4.4; provided however, notwithstanding the foregoing Lyell will reimburse GSK for manufacturing and supply of GMP vector for the lete-cel Underlying NY-ESO Product ("GSK Vector") on the terms set forth in the vector manufacturing agreement described in Section 6.2(c).

11. **Section 3.5 Updates and Discussions.** Section 3.5 is hereby renumbered as Section 3.5(a), and a new Section 3.5(b) is added as follows:

"(b)(i) Without limiting Section 3.5(a), GSK shall provide to Lyell, through an agreed upon mechanism (such as meetings of a subcommittee or working group established by the JSC),

updates on GSK Development Programs, including plans for [*] or expected timing, synopsis or overview of any [*] from ongoing clinical trials of the applicable Product. GSK shall provide the foregoing information [*], unless otherwise agreed.

(ii) If GSK becomes aware of a safety finding or observes a serious adverse event (SAE) during a clinical trial of a Product that could reasonably be attributable to the inclusion of the applicable Anti-Exhaustion Component, then GSK shall, as soon as practical taking into account the seriousness of the event, inform Lyell and provide information reasonably sufficient to enable Lyell's understanding of the nature of and, to the extent available, the cause of that SAE or safety finding. Similarly, if during a Lyell clinical trial of a product candidate incorporating an Anti-Exhaustion Component that is the subject of a GSK Development Program, Lyell becomes aware of a safety finding or observes a serious adverse event (SAE) that reasonably could be attributable to the inclusion of such Anti-Exhaustion Component, then Lyell shall, as soon as practical taking into account the seriousness of the event, inform GSK and provide information reasonably sufficient to enable GSK's understanding of the nature of and, to the extent available, the cause of that SAE or safety finding.

(iii) Without limiting Sections 4.1(b) and 4.1(e), with respect to GSK Development Programs, Lyell shall have the right to have [*] (or such other number as agreed by the Parties and permitted by the FDA) [*] (unless otherwise agreed in advance by GSK to allow Lyell's representative to participate in) that portion of GSK's meeting with the FDA (in person or via teleconference) that specifically relates to the applicable Anti-Exhaustion Component; provided that with respect to the Epi-R NY-ESO Program where Lyell is manufacturing any NY-ESO Epi-R TCR Product for GSK after Epi-R NY-ESO Option Exercise, Lyell shall have the right to have [*] [*] (including a CMC representative) attend such meetings. In addition, GSK will use reasonable efforts to share with Lyell material correspondence or communication with the FDA that relates specifically to the Anti-Exhaustion Component and will reasonably consider Lyell's input with respect to the elements of such correspondence or communication specific to the Anti-Exhaustion Component."

12. **New Section 3.11 Delivery and Sharing of Information and Materials.** The following Section 3.11 is hereby appended to the end of Article 3:

"3.11 **Delivery and Sharing of Information and Materials.**

(a) **By Lyell prior to IND filing for the Epi-R NY-ESO Product and start of the Epi-R NY-ESO Phase 1 Clinical Trial.** Promptly after the 2nd Amendment Effective Date, Lyell and GSK shall coordinate the disclosure and transfer from Lyell to GSK (to the extent not previously disclosed and transferred) of Lyell Know-How relevant to planning and decision-making for the Epi-R NY-ESO Phase 1 Clinical Trial, which includes the following (but specifically excludes Sensitive Epi-R Information):

(i) all data and results from both in vitro and in vivo studies of Epi-R with the lete-cel Underlying NY-ESO Product;

(ii) Information to support GSK's conduct (including analysis of data and results) of the Epi-R NY-ESO Phase 1 Clinical Trial, such as assay information or procedures for biomarker activities;

(iii) Information about Epi-R and the Bothell Facility, as needed to help to facilitate GSK planning and risk mitigation related to manufacture and supply of NY-ESO Epi-R TCR Product following Epi-R NY-ESO Option Exercise; and

(iv) Information to support an inspection and quality audit of the Bothell Facility, including facility information, equipment specification and process information.

(b) **By GSK prior to start of the Epi-R NY-ESO Phase 1 Clinical Trial.** Promptly after the 2nd Amendment Effective Date, Lyell and GSK shall coordinate the disclosure and transfer from GSK to Lyell (to the extent not previously disclosed and transferred) of GSK Know-How relevant to planning and preparation for Lyell's regulatory and manufacturing obligations under the Epi-R Component Development Program, and Lyell shall be permitted to use such GSK Know-How solely for the purpose of carrying out such obligations only for so long as required under the Epi-R Component Development Program."

13. **New Section 3.12 Use of Epi-R.** The following Section 3.12 is hereby appended to the end of Article 3:

"3.12 **Use of Epi-R**. Commencing on the 2nd Amendment Effective Date and continuing until Epi-R NY-ESO Option Exercise, unless otherwise agreed in writing by Lyell, GSK may use the Lyell-Know How provided by Lyell under Section 3.11 solely as follows:

(a) for planning and communication with the FDA, preparation of Regulatory Materials and regulatory documents, to support planning for and the conduct of the Epi-R NY-ESO Phase 1 Clinical Trial, including coordination and communication with clinical sites and vendors,

(b) for any of the activities described in Section 3.11,

(c) to understand the clinical benefit of the Epi-R NY-ESO Product (including Epi-R and the Underlying NY-ESO Product), and

(d) for internal assessment and communication of risks and mitigations associated with Lyell manufacturing at the Bothell Facility and for [*] and other planning for future manufacture and supply of NY-ESO Epi-R TCR Product following Epi-R NY-ESO Option Exercise [*]."

14. **New Section 4.1(e) Regulatory Matters for Epi-R NY-ESO Program.** The following Section 4.1(e) is hereby appended to the end of Section 4.1:

"(e) **Regulatory Matters for Epi-R NY-ESO Program**. Notwithstanding Section 4.1(b):

(i) For the Epi-R Component Development Program, Lyell will have responsibility for preparing and submitting an IND to the FDA for the Epi-R NY-ESO Product. In addition, GSK will have responsibility for developing and submitting to Regulatory Authorities the protocol for the Epi-R NY-ESO Phase 1 Clinical Trial, specifically an amendment to the "master protocol" for NY-ESO-targeted T cell therapies (the "**NY-ESO FTIH Master Protocol**"), and each Party will cross-reference the IND documentation (including the NY-ESO FTIH Master Protocol) submitted by the other Party as needed. A graphical description of those responsibilities is on **Exhibit 1**; a subcommittee or working group established under JSC oversight may agree on additional details of how those responsibilities will be executed. Each Party will own all Regulatory Materials for the Epi-R NY-ESO Product, as applicable, prepared and submitted by such Party under this Section 4.1(e)(i) and all such Regulatory Materials shall be submitted in the name of such Party (or its Affiliate or Sublicensee, as applicable). Each Party shall have, subject to the remainder of this Section 4.1(e)(i), final decision-making authority with respect to its responsibilities hereunder. Each Party shall reasonably cooperate with the other Party with respect to their responsibilities under this Section 4.1(e) and, to the extent not previously provided, provide to other Party all Information Controlled by such Party as may be reasonably required to prepare or support any IND, protocol or other Regulatory Materials for the Epi-R NY-ESO Product in the Field in the Territory and interactions with any Regulatory Authority in connection with Development or Regulatory Approval of the Epi-R NY-ESO Product, including (A) review and comment by GSK on the IND to be filed by Lyell for the Epi-R NY-ESO Product, (B) review and comment by Lyell on the portions of the NY-ESO FTIH Master Protocol related to the Epi-R NY-ESO Phase 1 Clinical Trial, (C) sharing by each Party of any communication with the FDA or other Regulatory Authority on any of the foregoing, and (D) attendance by up to [*] representatives of each Party in teleconference or in person meetings with the applicable Regulatory Authority.

(ii) For the avoidance of doubt, following exercise of the Epi-R NY-ESO Option, GSK shall have sole responsibility and decision-making authority with respect to regulatory matters for the NY-ESO Epi-R TCR Products. Subject to Section 4.1(e)(i), GSK shall have sole responsibility for preparing and submitting all Regulatory Materials for NY-ESO Epi-R TCR Products in the Field in the Territory, including preparing, submitting and holding all INDs (including the IND for the Epi-R NY-ESO Product filed by Lyell as set forth in Section 4.1(e)(i) after assignment to GSK), BLAs and MAAs for NY-ESO Epi-R TCR Product. GSK shall keep Lyell reasonably informed, either through the JSC, or in the event the JSC has been disbanded, through its regular reporting obligations under this Agreement, of its (and its Affiliates) interactions with Regulatory Authorities regarding Regulatory Materials, to the extent such interactions reasonably relate to a NY-ESO Epi-R TCR Product. Lyell shall reasonably cooperate with GSK and, to the extent not previously provided, provide to GSK all Information Controlled by Lyell related to Epi-R and Lyell's manufacturing activities for the Epi-R NY-ESO Phase 1 Clinical Trial, in each case as may be reasonably requested by GSK, in order to prepare or support any Regulatory Materials for NY-ESO Epi-R TCR Products in the Field in the Territory and interactions with any Regulatory Authority in connection with Development or Regulatory Approval of the NY-ESO Epi-R TCR Products and the Epi-R GSK Development Program.

Notwithstanding the foregoing, Lyell's obligation to provide Sensitive Epi-R Information to GSK is limited only to the circumstance where the Sensitive Epi-R Information is required by Applicable Law to enable GSK to carry out its Development, Manufacture or Commercialization responsibilities for the relevant NY-ESO Epi-R TCR Products, or access to Sensitive Epi-R Information is required by Applicable Law or a Governmental Authority; provided, that Lyell will have the right to instead provide any such Sensitive Epi-R Information directly to the relevant Governmental Authority (including by provision of Regulatory Materials) if such provision will satisfy such requirement. GSK will use such information only to the extent required by such Applicable Law or Governmental Authority or to the extent required to carry out its Development, Manufacture or Commercialization responsibilities hereunder and will only permit access to those of its employees who need to know for such purposes. GSK will own all Regulatory Materials for NY-ESO Epi-R TCR Products prepared and submitted by GSK under this Section 4.1(e)(ii) and all such Regulatory Materials shall be submitted in the name of GSK (or its Affiliate or Sublicensee, as applicable). For clarity, nothing in this Section 4.1(e) shall be deemed to transfer ownership of any Information provided by Lyell to GSK for use in preparing and submitting such Regulatory Materials, or change or modify the scope of the licenses granted hereunder.

(iii) Subject to the terms and conditions of this Agreement, each Party (on behalf of itself and its Affiliates and Sublicensees) hereby grants to the other Party a non-exclusive Right of Reference (including the right to grant further Rights of Reference to any of such Party's Affiliates, licensees or Third Party distributors) to any such Regulatory Materials and Regulatory Approvals Controlled by the other Party pursuant to Section 4.1(e)(i) or 4.1(e)(ii), but only to the extent (x) such Regulatory Materials and Regulatory Approvals pertain to Epi-R and (y) such right of reference is required or reasonably useful for (A) Lyell to obtain or maintain any Regulatory Approval of a product containing Epi-R and for the sole purpose of preparing, obtaining and maintaining such Regulatory Approvals and to otherwise Develop, manufacture and Commercialize such product or (B) GSK to obtain or maintain any Regulatory Approval of NY-ESO Epi-R TCR Products. For the avoidance of doubt, the foregoing Right of Reference shall not be construed as an obligation for GSK to provide Lyell, its Affiliates, licensees or Third Party distributors with any Information Controlled by GSK developed pursuant to the GSK Program for the NY-ESO Epi-R TCR Products."

15. **New Section 4.4. Clinical Coordination of the Epi-R NY-ESO Program.** The following Section 4.4 is hereby appended to the end of Article 4:

"4.4 Coordination and Conduct of the Epi-R NY-ESO Program.

(a) **Clinical Development Plan and Coordination.** Lyell and GSK will collaborate on the design of the Epi-R NY-ESO Phase 1 Clinical Trial, which shall be conducted by GSK under the NY-ESO FTIH Master Protocol (the "**Clinical Plan**"). The Clinical Plan will include appropriate [*] designed to measure and understand differences between the lete-cel Underlying NY-ESO Product and the Epi-R NY-ESO Product, as well as a plan to enable adequate and timely enrollment. For clarity, except for the matters set forth

above in this Section 4.4(a), if the Parties cannot reach agreement on the Clinical Plan, GSK shall have final decision-making authority following escalation to the JSC and Senior Executives as set forth in Section 2.1(d) and the dispute will not be subject to further escalation or resolution in accordance with the provisions of Article 16. In addition, GSK (i) shall be fully responsible for its design and conduct, including site selection and managing medical and other trial management issues and (ii) shall be the conduit to the clinical site and staff, unless otherwise agreed by GSK for specific items requiring Lyell involvement, and in each case, in its discretion and at its cost, which activities shall not be subject to JSC decision-making or escalation. GSK shall own and maintain its own database of clinical trial data accumulated from all clinical trials of the Underlying NY-ESO Product(s) and the Epi-R NY-ESO Product for which it was responsible, including adverse drug event information for the Epi-R NY-ESO Program.

(b) **Ongoing Communication and Data Sharing During the Epi-R Component Development Program**. Through the JSC or a subcommittee or working group created by the JSC, Lyell and GSK will coordinate and share detailed information about the Epi-R Component Development Program on an ongoing basis, pursuant to a data sharing plan agreed by the Parties prior to the first subject being enrolled in the Epi-R NY-ESO Phase 1 Clinical Trial (the "**Data Sharing Plan**"). The Data Sharing Plan will include the Information described in Section 3.5(b)(i) and (ii), and the following: from Lyell, summary new [*], subject to Third Party obligations, and from GSK, (i) [*], and patients [*], (ii) regulatory updates and (iii) aggregate [*] from [*] that GSK generates in the ordinary course of Development [*]. GSK will not be obligated to conduct any additional [*] for provision to Lyell hereunder. For the avoidance of doubt, GSK will not be obligated to transfer or disclose [*], but will provide [*] by GSK and relevant to Epi-R to Lyell, including the results of any [*] and the final clinical study report from the Epi-R NY-ESO Phase 1 Clinical Trial (the "**Clinical Study Report**"). All such information and data described in this Section 4.4(b), including the Clinical Study Report, are the Confidential Information of GSK.

(c) **Clinical Decision Process.** On an ongoing basis during the Epi-R NY-ESO Phase 1 Clinical Trial, Lyell will provide to GSK Information about the Epi-R NY-ESO Product, as further set forth in the Product Manufacturing Agreement, including release criteria, characterization data and results of any testing conducted to determine whether the Epi-R NY-ESO Product meets the specifications and is suitable for clinical administration. In addition, prior to start of enrollment for the Epi-R NY-ESO Phase 1 Clinical Trial, GSK and Lyell will agree on a process to enable GSK, as sponsor of the Epi-R NY-ESO Phase 1 Clinical Trial to fully investigate any adverse event or any Epi- R NY-ESO Product that does not meet the applicable specifications and to develop a plan for remedying any such adverse event or non-specification Epi-R NY-ESO Product. Such process shall include key points of contact from the Parties, timelines for provision of Information to GSK and requirements for each party to discuss all such Information on an expedited basis."

16. **New Section 6.2(c) Manufacturing and Supply Arrangements for the Epi-R Component Development Program.** A new Section 6.2(c) Manufacturing and Supply Arrangements for the Epi-R Component Development Program is hereby added to the end of Section 6.2:

"(c) **Manufacturing and Supply Arrangements for the Epi-R Component Development Program**. Prior to start of enrollment for the Epi-R NY-ESO Phase 1 Clinical Trial, the Parties will enter into (i) a vector manufacturing agreement, pursuant to which GSK shall manufacture (or have manufactured) and supply (or have supplied) to Lyell the GSK Vector solely for the purpose of permitting Lyell to manufacture the applicable Epi-R NY-ESO Product for the Epi-R NY-ESO Phase 1 Clinical Trial, (ii) a product manufacturing agreement pursuant to which GSK will supply materials from Epi-R NY-ESO Phase 1 Clinical Trial subjects to Lyell, and Lyell will use such materials solely for the purpose of manufacturing and supplying the Epi-R NY-ESO Product for such Epi-R NY-ESO Phase 1 Clinical Trial (the "**Product Supply Agreement**"), and (iii) a quality agreement setting out quality-related responsibilities and procedures associated with the Epi-R NY-ESO Product (the "**Quality Agreement**"). The Product Supply Agreement will include provisions (A) addressing the matters set forth in Section 4.4(d), and (B) requiring Lyell to inform the JSC as soon as reasonably practicable if Lyell reasonably believes that its obligation to provide the Epi-R NY-ESO Product for the Epi-R NY-ESO Phase 1 Clinical Trial may be delayed or otherwise adversely impacted, including the details of the delay or other issue, and the JSC will discuss and agree a risk mitigation plan to ensure supply of the Epi-R NY-ESO Product in a timely fashion, which mitigation plan may include the establishment of GSK as a secondary supplier."

17. **New Section 6.4 Inspection of Lyell's Manufacturing Facility (Bothell).** The following Section 6.4 is hereby appended to the end of Article 6:

"6.4 **Inspection of Lyell's Manufacturing Facility (Bothell)**. Promptly after the 2nd Amendment Effective Date, Lyell and GSK shall develop a plan to enable GSK to conduct an initial audit of Lyell's manufacturing facility in Bothell, Washington (the "**Bothell Facility**"), such plan to be consistent with the goal of GSK pre-approving the Bothell Facility for the clinical supply of the Epi-R NY-ESO Product for the Epi-R NY-ESO Phase 1 Clinical Trial. Pursuant to such plan, the Parties shall share sufficient information with each other to enable such audit; provided under no circumstances shall Lyell be obligated to share with GSK [*] in connection with the audit. If GSK, according to its customary standards, determines that there are major or critical findings that require mitigation or resolution in order for GSK to pre-approve the Bothell Facility for such clinical supply, then Lyell will submit to GSK a proposed recovery plan as soon as reasonably practicable and will use reasonable efforts, at Lyell's cost and in consultation with GSK, to implement such recovery plan promptly after submission to GSK. Lyell shall provide information and updates to GSK to permit GSK to confirm that the recovery plan has been implemented to GSK's reasonable satisfaction. If reasonably deemed necessary by GSK in consultation with Lyell, then Lyell will allow GSK to conduct an onsite inspection of the Bothell Facility in order to confirm implementation of the recovery plan. If Lyell fails to implement the recovery plan to GSK's reasonable satisfaction, then GSK has the right to terminate activities with respect to the Epi-R Component Development Program. If Lyell disagrees with GSK's

determination, it shall provide GSK written notice thereof within [*] of receipt of GSK's notice and thereafter the JSC shall decide (subject to resolution pursuant to Section 2.1(d) and Section 16.1) whether the Epi-R Component Development Program shall be terminated (and the conduct of the Epi-R Component Development Program will be suspended pending such determination); provided that a failure by the Senior Executives to reach agreement hereunder shall not be eligible for escalation to arbitration. If (a) Lyell agrees (or does not provide notice of disagreement as described above), (b) the JSC so determines or (c) the Senior Executives are unable to reach an agreement on whether the Epi-R Component Development Program should terminate, then, in each case, the Epi-R Component Development Program shall be deemed terminated. Following such initial audit of the Bothell Facility by GSK, and GSK's reasonable satisfaction with such audit (or to the extent there is a recovery plan, GSK's reasonable satisfaction that such recovery plan has been implemented), all other audits shall be conducted under the terms of the Quality Agreement."

18. **New Section 6.5 Manufacturing for the Epi-R NY-ESO Program.** The following Section 6.5 is hereby appended to the end of Article 6:

"6.5 **Manufacturing for the Epi-R NY-ESO Program**. At GSK's request, the JSC will agree on a strategy and plan for the manufacturing of the [*] Products [*] ("[***] Plan**"), such plan to be agreed prior to GSK's Epi-R NY-ESO Option Exercise. The [*] Plan will include a planned date or milestone by which the manufacturing responsibility for the Epi-R NY-ESO Product and any [*] shall be transferred from Lyell to GSK. At GSK's election, the [*] Plan also shall include a schedule to be agreed by the JSC setting forth Lyell's obligation to continue to manufacture the Epi-R NY-ESO Product or [*] for clinical studies under the Epi-R GSK Development Program; provided that such manufacturing by Lyell beyond the Epi-R NY-ESO Product for the Epi-R NY-ESO Phase 1 Clinical Trial will be under commercially reasonable terms that are standard in the industry for such stage of development and as negotiated in good faith by Lyell and GSK."

19. **New Section 6.6 Technology Transfer of Epi-R.** The following Section 6.6 is hereby appended to the end of Article 6:

"6.6 **Technology Transfer of Epi-R**. Pursuant to the [*] Plan, GSK will assume manufacturing of the NY-ESO Epi-R TCR Products for the Epi-R GSK Development Program. Lyell will provide or ensure provision to GSK of all required GMP or other appropriate grade of the [*] for the Epi-R GSK Development Program to support manufacture by GSK of any and all NY-ESO Epi-R TCR Products under the Epi-R GSK Development Program; provided that GSK (1) shall not by itself, or through a Third Party, reverse engineer the [*]; (2) shall not transfer Epi-R to a CMO unless (A) such transfer requires such CMO to be bound by all restrictions applicable to GSK hereunder with respect to use of the Epi-R or (B) Lyell provides prior written consent to such transfer; and (3) shall not modify Epi-R, [*], without Lyell prior written consent. Lyell shall not be obligated to conduct [*] from Lyell to GSK pursuant to the [*] Plan. Without limiting Section 4.1(e)(ii) and (iii), Lyell shall notify GSK of changes to the [*] that are required for GSK to manufacture any NY-ESO Epi-R TCR Product."

20. **Section 7.1(a)**. Section 7.1(a) is hereby deleted and replaced in its entirety as follows:

"Subject to the terms and conditions of this Agreement, with respect to each Collaboration Program, effective as of the date of GSK's Option Exercise for such Collaboration Program, Lyell hereby grants to GSK an exclusive license, with the right to grant sublicenses through multiple tiers as provided in Section 7.2, under Lyell Technology and Lyell's interest in and to Joint Technology to make, have made, use, sell, offer for sale, import (including the exclusive right to Develop and Commercialize) (i) the Collaboration Anti-Exhaustion Components for such Collaboration Program in Compounds or Products (which further includes the right to make, have made, use, sell, offer for sale, import (including the exclusive right to Develop and Commercialize) Compounds or Products to the extent incorporating such Collaboration Anti-Exhaustion Components), (ii) with respect to a Lyell PoC Development Program, the Compound and Product for which Academic PoC was achieved, and (iii) in each case in respect of clauses (i) or (ii) as such Collaboration Anti-Exhaustion Components may be modified pursuant to Section 3.1(c), in all such cases in the Field in the Territory. To be clear, (x) nothing in this license provided under Section 7.1(a) shall be deemed to grant GSK a right or license to incorporate any Lyell Technology other than a Collaboration Anti-Exhaustion Component provided under this Agreement (or modification thereof under Section 3.1(c)) into a Compound or Product (e.g., GSK would not be licensed, under a Patent Controlled by Lyell claiming a proprietary binding domain for a Target other than a Collaboration Target, to incorporate into a Product or Compound such binding domain) and (y) Lyell would have the right to make, have made, use, sell, offer for sale and import (including Develop and Commercialize) Collaboration Anti-Exhaustion Components in T-Cell Therapies directed to Targets other than Collaboration Targets, and, subject to Section 11.1, grant sublicenses to Third Parties to so. For the avoidance of doubt, Lyell shall have the right to use the data generated by it under the Epi-R Component Development Program, as well as the data and information disclosed to it in accordance with Section 4.4(b), in each case solely related to Epi-R, to make, have made, use, sell, offer for sale and import (including Develop and Commercialize) Epi-R for directed to targets other than Collaboration Targets, and, subject to Section 11.1, grant sublicenses to Third Parties to make, have made, use, sell, offer for sale and import (including Develop and Commercialize) Epi-R for T-Cell Therapies directed to targets other than Collaboration Targets. Notwithstanding the foregoing, Lyell shall not, itself or with or through a Third Party, modify or conduct any [*] disclosed to it by GSK from the Epi-R NY-ESO Phase 1 Clinical Trial relating to the Epi-R NY-ESO Product or the Underlying NY-ESO Product without the prior written consent of GSK and Lyell shall not disclose any data and information provided to it under Section 4.4(b) to any Third Party without the prior written consent of GSK."

21. Section 7.4(b). Section 7.4(b) is hereby deleted and replaced in its entirety as follows:

(b) **GSK Patents; GSK [*] Improvements.**

(i) Subject to the terms and conditions of this Agreement, including Sections 11.1 and 11.2, GSK hereby grants to Lyell (a) a worldwide, non-exclusive, fully-paid up license, with the right to grant and authorize sublicenses, to GSK [*] Improvements (including all intellectual property rights therein Controlled by GSK and subject to the exclusive license granted to GSK under Section 7.1(a) above) to make, use, sell, offer to sell, import and otherwise exploit for any purpose Anti-Exhaustion Components provided to GSK by Lyell under a Collaboration Program and (b) a worldwide, non-exclusive, fully-paid up license, with the right to grant and authorize sublicenses, under the GSK Licensed Patents to make, use, sell, offer to sell, import and otherwise exploit for any purpose Anti-Exhaustion Components provided to GSK by Lyell under a Collaboration Program; provided that in each case of (a) and (b), Lyell's right to grant and authorize sublicenses to Third Parties without GSK prior consent is limited to sublicenses to bona fide collaborators, licensees, contract manufacturers, contract research organizations and other service providers to whom Lyell has granted a license to the applicable Anti-Exhaustion Component or who have been engaged to provide services to Lyell with respect to such Anti-Exhaustion Component. Promptly after the execution of each sublicense as provided in this

Section 7.4(b)(i) (or amendment or termination thereof), Lyell shall provide GSK with a notice of the sublicense, including the identity of the sublicensee.

(ii) GSK shall promptly disclose and provide to Lyell all Information and Materials with respect to GSK [*] Improvements licensed to Lyell under Section 7.4(b)(i) above. Such disclosure shall include such Information and Materials as are necessary or reasonably useful to understand and exploit such GSK [*] Improvements, including the formulation, use, production, scale-up, processing, handling, effects or characteristics of products comprising or utilizing such GSK [*] Improvements, but only to the extent such Information and Materials comprise or relate primarily to such GSK [*] Improvements.

(iii) For such purposes, "**GSK [*] Improvements**" means improvements, innovations, advancements, inventions or developments (whether or not patentable) to the extent: (1) relating primarily to [*] any Anti-Exhaustion Components provided to GSK by Lyell in connection with this Agreement, (2) made by or on behalf of GSK during the period beginning on the Effective Date and ending on the [*] thereof, and (3) Controlled by GSK.

22. **New Section 7.8 Epi-R NY-ESO Product Pre-Option License.** A new Section 7.8 is hereby added to the end of Article 7:

"7.8 **Epi-R NY-ESO Product Pre-Option License**.

(a) **License to GSK**. Subject to the terms and conditions of this Agreement, Lyell hereby grants to GSK a worldwide, non-exclusive, non-sublicensable, fully-paid up license under the Lyell Technology used for the Epi-R Component Development Program, as disclosed to GSK under Section 3.11 or otherwise under this Agreement, as necessary or useful to conduct its portion of the Epi-R Component Development Program, including to conduct the Epi-R NY-ESO Phase 1 Clinical Trial, to undertake joint or agreed assessments, testing and evaluation of clinical and manufacturing data, and to meet GSK's clinical and regulatory obligations under this Agreement with respect to the Epi-R Component Development Program, and not for any other purposes.

(b) **Research and Manufacturing License to Lyell**. Subject to the terms and conditions of this Agreement, GSK hereby grants to Lyell a worldwide, non-exclusive, non-sublicensable, royalty-free license under any and all GSK intellectual property rights covering the lete-cel Underlying NY-ESO Product and the GSK Vector, or other GSK Information or Materials disclosed to Lyell under Section 3.11 or otherwise under this Agreement, as necessary to conduct the Epi-R Component Development Program, including to undertake manufacturing of the Epi-R NY-ESO Product and to meet its clinical and regulatory obligations under this Agreement with respect to the Epi-R Component Development Program, and not for any other purpose."

23. **New Section 8.3(d) Epi-R NY-ESO Phase 1 Clinical Trial.** A new Section 8.3(d) is hereby added to the end of Section 8.3:

"(d) **Epi-R NY-ESO Phase 1 Clinical Trial**. For purpose of payment of milestones under Section 8.3, development of any NY-ESO Component Product would trigger a payment obligation, whether or not that NY-ESO Component Product was the subject of a Lyell

Development Program under this Agreement. Further, milestones in Section 8.3 will be paid once for the first NY-ESO Component Product, even if more than one NY-ESO Component Product meets the underlying milestone requirements. For illustrative purposes, Milestone 2 under Table 1 shall be deemed achieved only upon the first to occur of either (i) Initiation by or on behalf of GSK of the Epi-R NY-ESO Phase 1 Clinical Trial or (ii) Initiation by or on behalf of GSK of a Phase 1 Clinical Trial of the Gen-R Product."

24. **Section 8.4(b).** A new sentence is hereby added to the end of Section 8.4(b):

"For purpose of payment of milestones under Section 8.4, Development of any NY-ESO Component Product shall trigger a payment obligation, whether or not that NY-ESO Component Product was the subject of a Lyell Development Program.

25. **Section 8.5(a) General.** The first paragraph of Section 8.5(a) shall be amended in its entirety to read as follows:

(a) **General**. In further consideration of the rights and licenses granted by Lyell to GSK hereunder, GSK shall pay to Lyell royalties based on the Net Sales of all Products and Compounds for a Collaboration Program, during the applicable Royalty Term. For clarity, for purposes of this Section 8.5(a), the Epi-R Component Development Program (and related GSK Program) and the Gen-R Component Development Program (and related GSK Program) shall be treated by the Parties as a single Collaboration Program such that only one royalty will be payable if a Product both contains the Gen-R Component and uses the Epi-R Component. The royalty payable with respect to Products and Compounds shall be tiered based upon the level of total aggregate Net Sales in a Calendar Year of all Products and Compounds within the same Collaboration Program by all Related Parties. Royalties shall be calculated by multiplying the applicable base royalty rates ("**Base Royalty Rate**") (which Base Royalty Rates shall also be determined based on whether a Collaboration Program is an Active GSK Program or not) by the corresponding incremental portion of Net Sales Products and Compounds within the Collaboration Program as set forth in Table 3 below:"

26. **Section 9.1. Ownership of Information and Inventions**. The second sentence of Section 9.1 shall be amended in its entirety to read as follows:

"Notwithstanding the foregoing, except as set forth in Section 7.4: (1) Lyell will own all inventions (and all Patent and other intellectual property rights therein) (i) solely invented by GSK or its Affiliates and/or their respective employees, agents or independent contractors, and (ii) jointly invented by employees, Affiliates, agents or independent contractors of each Party in the course of conducting its activities under this Agreement and all Patent and other intellectual property rights therein, in each case of (i) and (ii) that are Improved Anti-Exhaustion Components; and (2) subject to the foregoing clause (1), (a) each Party will own all inventions (and all Patent and other intellectual property rights therein) solely invented by or on behalf of it or its Affiliates and/or their respective employees, agents and independent contractors in the course of conducting its activities under this Agreement (collectively, "**Sole Inventions**"); and

(b) all inventions invented jointly by employees, Affiliates, agents or independent contractors of each Party in the course of conducting its activities under this Agreement and all Patent and other intellectual property rights therein (collectively, "**Joint Inventions**") will be jointly owned by the Parties."

"**Improved Anti-Exhaustion Components**" means compositions and methods made by or under the authority of GSK or its Affiliates in connection with this Agreement that comprise or incorporate or are specifically related to Lyell Anti-Exhaustion Technology provided to GSK under a Collaboration Program (and not related specifically to a T-Cell Therapy or Product). Any composition or method made by or under the authority of GSK or any of its Affiliates independent of this Agreement and without using or comprising Lyell Anti-Exhaustion Technology shall not be an Improved Anti-Exhaustion Component.

GSK shall promptly disclose and provide to Lyell all Information and Materials with respect to Improved Anti-Exhaustion Components. Such disclosure shall include such Information and Materials as are necessary or reasonably useful to understand and exploit such Improved Anti-Exhaustion Components, including protein and nucleotide sequences embodying or expressing such Improved Anti-Exhaustion Components, but only to the extent such Information and Materials comprise or relate primarily to such Anti-Exhaustion Components.

27. **Section 9.2(a) Prosecution of Product Specific Patents.** The first paragraph of Section 9.2(a) shall be amended in its entirety to read as follows:

"(a) For each Collaboration Program, Lyell shall file one or more Product Specific Patents. Lyell shall provide GSK with a draft of each such application at least [*] prior to filing to give GSK a reasonable opportunity to review and comment on any such application proposed to be sent to any patent office. Lyell shall consider in good faith GSK's comments on such draft applications to the extent such applications pertain to Compounds and Products. Promptly after filing such patent application, Lyell shall provide GSK a copy of each such application as filed, together with notice of its filing date and serial number. After such patent application is so filed, it shall be deemed a Product Specific Patent and Prosecution of such patent application shall continue to be handled by Lyell through PCT filing at Lyell's sole cost, and thereafter by GSK as set forth in Section 9.2(b) below (or by Lyell to the extent set forth in the last sentence of Section 9.2(b)). GSK shall provide Lyell reasonable notice to file an application in any non-PCT countries. For clarity, no General Tools Patent shall be deemed a Product Specific Patent."

28. **Section 9.2(b) Prosecution of Product Specific Patents.** The first sentence of Section 9.2(b) shall be amended in its entirety to read as follows:

"Following PCT filing of Product Specific Patents by Lyell, GSK will have the first right, but not the obligation, to further draft, file, prosecute and maintain the Product Specific Patents for such Collaboration Program (including any oppositions, interferences, reissue proceedings, reexaminations and post-grant proceedings) in all jurisdictions in the Territory (such activities

with respect to Patents being the "**Prosecution**", with the term "**Prosecute**" having the corresponding meaning), including the Major Markets, at its sole expense."

29. **Section 9.8 Patent Contacts.** The following language is hereby added to the end of Section 9.8:

"Such strategies will include, as needed, coordination of filing of, on the one hand, Patents claiming Improved Anti-Exhaustion Components, and on the other hand Product Specific Patents or other Patents claiming Products. Further, promptly after becoming aware of a composition or method made by or under the authority of GSK or its Affiliates in connection with this Agreement that may constitute an Improved Anti-Exhaustion Component, GSK's Patent Contact will contact Lyell's Patent Contact to discuss in good faith whether such composition or method is an Improved Anti-Exhaustion Component or a Sole Invention owned by GSK. If the Patent Contacts cannot agree within [*] after meeting, the matter will be escalated to the JSC for final agreement.

30. **Miscellaneous**. This Second Amendment may be executed in counterparts, each of which shall constitute an original and all of which, when taken together, shall constitute one instrument. For purposes hereof, this Second Amendment may be executed and delivered through the email of pdf copies of the executed Second Amendment. No modification of or amendment to this Second Amendment, nor any waiver of any rights under this Second Amendment, will be effective unless in writing signed by the duly authorized representatives of both parties, and the waiver of any breach or default will not constitute a waiver of any other right hereunder or any subsequent breach or default. This Second Amendment shall be governed in accordance with the substantive laws of the State of Delaware, excluding any conflicts or choice of law or principle that might otherwise make this Agreement subject to the substantive law of another jurisdiction.

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IN WITNESS WHEREOF, the Parties hereto have caused this Second Amendment to be executed by their duly authorized representatives as set forth below.

Lyell Immunopharma, Inc.	**GlaxoSmithKline Intellectual Property (No.5) Limited**
By: /s/ Liz Homans	By: /s/ John Sadler
Name: Liz Homans	Name: John Sadler
Title: CEO	Title: Authorized Signatory, for and on behalf of Edinburgh Pharmaceutical Industries Limited, Corporate Director

Exhibit 1

[*]

Exhibit 23.1

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We consent to the incorporation by reference in the Registration Statement (Form S-8 No. 333-257249) pertaining to the Lyell Immunopharma, Inc. 2018 Equity Incentive Plan, the Lyell Immunopharma, Inc. 2021 Equity Incentive Plan, and the Lyell Immunopharma, Inc. 2021 Employee Stock Purchase Plan of our report dated March 29, 2022, with respect to the consolidated financial statements of Lyell Immunopharma, Inc. included in this Annual Report (Form 10-K) for the year ended December 31, 2021.

/s/ Ernst & Young LLP
Redwood City, California
March 29, 2022

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, Elizabeth Homans, certify that:

1. I have reviewed this annual report on Form 10-K of Lyell Immunopharma, 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)) 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) 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

   (c) 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: March 29, 2022 By: /s/ ELIZABETH HOMANS

Elizabeth Homans

Chief Executive Officer
(Principal 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, Charles Newton, certify that:

1. I have reviewed this annual report on Form 10-K of Lyell Immunopharma, 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)) 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) 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

   (c) 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: March 29, 2022 By: /s/ CHARLES NEWTON

Charles Newton

Chief Financial Officer
(Principal Financial and Accounting 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), each of the undersigned hereby certifies in her or his capacity as an officer of Lyell Immunopharma, Inc, Inc. (the "Company"), that, to the best of her or his knowledge:

(1) the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2021, to which this Certification is attached as Exhibit 32.1 (the "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 Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

By: /s/ ELIZABETH HOMANS
Elizabeth Homans
Chief Executive Officer
(Principal Executive Officer)

Date: March 29, 2022

By: /s/ CHARLES NEWTON
Charles Newton
Chief Financial Officer
(Principal Financial and Accounting Officer)

Date: March 29, 2022