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

FORM 10-K

(Mark One)

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

For the fiscal year ended December 31, 2020

OR

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

For the transition period from to

Commission file number 001-36783

Bellicum Pharmaceuticals, Inc.

(Exact name of registrant as specified in its charter)

Delaware	**20-1450200**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification No.)**

3730 Kirby Drive, Suite 1200, Houston, TX	**77098**
(Address of principal executive offices)	**(Zip code)**

(832) 384-1100
(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, par value $0.01 per share	**BLCM**	**The Nasdaq Capital Market**

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

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

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

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

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§229.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ☒ No ☐

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

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

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

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

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

The approximate aggregate market value of the voting and non-voting common equity held by non-affiliates of the Registrant, based upon the last sale price of the common stock as reported on The Nasdaq Capital Market as of June 30, 2020 was $31,731,375. Shares of the Registrant's common stock held by each officer and director and by each person who owns 5% or more of the outstanding Common Stock have been excluded from such calculation in that such persons may be deemed to be affiliates. This determination of affiliate status is not necessarily a conclusive determination for other purposes.

As of March 22, 2021, there were 8,318,273 shares of the Registrant's common stock, par value $0.01 per share, outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the Registrant's Definitive Proxy Statement relating to its 2021 Annual Meeting of Stockholders are incorporated by reference into Part III of this Annual Report on Form 10-K. Such Proxy Statement will be filed with the U.S. Securities and Exchange Commission within 120 days following the Registrant's fiscal year ended December 31, 2020.

BELLICUM PHARMACEUTICALS, INC.
Form 10-K
For the Fiscal Year Ended December 31, 2020

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Signatures

SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This Annual Report on Form 10-K, including the sections entitled “Business,” “Risk Factors” and “Management’s Discussion and Analysis of Financial Condition and Results of Operations,” may contain “forward-looking statements.” We may, in some cases, use words such as “anticipate,” “believe,” “could,” “estimate,” “expect,” “intend,” “may,” “plan,” “potential,” “predict,” “project,” “should,” “will,” “would” or the negative of those terms, and similar expressions that convey uncertainty of future events or outcomes to identify these forward-looking statements. Any statements contained herein that are not statements of historical facts may be deemed to be forward-looking statements. Forward-looking statements in this Annual Report include, but are not limited to, statements about:

- the success, cost and timing of our product development activities and clinical trials;
- our ability to advance Chemical Induction of Dimerization, or CID, CID-based technologies, including CaspaCIDe and GoCAR-T;
- our ability to obtain and maintain regulatory approval of any of our product candidates, and any related restrictions, limitations and/or warnings in the label of an approved product candidate;
- our ability to obtain funding for our operations, including funding necessary to complete further development and commercialization of our product candidates;
- the commercialization of our product candidates, if approved;
- our plans to research, develop and commercialize our product candidates;
- our ability to attract collaborators with development, regulatory and commercialization expertise and the success of any such collaborations;
- future agreements with third parties in connection with the commercialization of our product candidates and any other approved product;
- the size and growth potential of the markets for our product candidates, and our ability to serve those markets;
- the rate and degree of market acceptance of our product candidates;
- regulatory developments in the United States, or U.S., and foreign countries;
- our ability to contract with third-party suppliers and manufacturers and their ability to perform adequately;
- the success of competing therapies that are or may become available;
- our ability to attract and retain key scientific or management personnel;
- our ability to grow our organization and increase the size of our facilities to meet our anticipated growth;
- the accuracy of our estimates regarding expenses, future revenue, capital requirements and needs for additional financing;
- our use of cash and other resources; and
- our expectations regarding our ability to obtain and maintain intellectual property protection for our product candidates.

These forward-looking statements reflect our management’s beliefs and views with respect to future events and are based on estimates and assumptions as of the filing date of this Annual Report and are subject to risks and uncertainties. We discuss many of these risks in greater detail under the heading “Risk Factors.” Moreover, we operate in a very competitive and rapidly changing environment. New risks emerge from time to time. It is not possible for our management to predict all risks, nor can we assess the impact of all factors on our business or the extent to which any factor, or combination of factors, may cause actual results to differ materially from those contained in any forward-looking statements we may make. Given these uncertainties, you should not place undue reliance on these forward-looking statements.

You should carefully read this Annual Report and the documents that we reference in this Annual Report completely and with the understanding that our actual future results may be materially different from what we expect. We qualify all of the forward-looking statements in this Annual Report by these cautionary statements.

Except as required by law, we undertake no obligation to update these forward-looking statements publicly, or to update the reasons that actual results could differ materially from those anticipated in any forward-looking statements, whether as a result of new information, future events or otherwise.

Except as otherwise specifically indicated, all information in this Annual Report on Form 10-K has been retroactively adjusted to give effect to a 1-for-10 reverse stock-split that was effective on February 5, 2020.

Summary of Risk Factors

There are a number of risks related to our business and our securities. 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 that we face. Additional discussion of the risks summarized in this risk factor summary, as we as other risks that we face, can be found in this report on Form 10-K in Item 1A entitled "Risk Factors"

- We have incurred net losses from operations in every year since our inception and anticipate that we will continue to incur net losses in the future.
- We will require significant funding to complete the development and commercialization of our product candidates. If we fail to obtain additional financing, we may have to delay, reduce or eliminate our development programs or commercialization efforts.
- Many of our current product candidates are in early stage clinical trials, and we may experience unfavorable results in the future.
- Our business could be adversely affected by the effects of health epidemics, including the recent COVID-19 outbreak, in regions where we or third parties on which we rely have distribution centers, concentrations of suppliers and sales and marketing teams or other business operations.
- If we encounter difficulties enrolling patients in our clinical trials, our clinical development activities could be delayed or otherwise adversely affected.
- Adverse side effects or other safety risks associated with our product candidates could delay or preclude approval, cause us to suspend or discontinue clinical trials, abandon product candidates, limit the commercial profile of an approved label, or result in significant negative consequences following marketing approval, if any.
- The regulatory approval process is lengthy and time-consuming, and we may experience significant delays in the clinical development and regulatory approval of our product candidates.
- We depend on intellectual property licensed from third parties and termination of any of these licenses could result in the loss of significant rights, which would harm our business.
- If our efforts to protect the proprietary nature of our technologies are not adequate, we may not be able to compete effectively in our market.
- We have limited foreign intellectual property rights and may not be able to protect our intellectual property rights throughout the world.
- If we fail to satisfy applicable listing standards, our common stock may be delisted from the Nasdaq Capital Market.
- Our principal stockholders own a significant percentage of our stock and can exert significant control over matters subject to stockholder approval.

ITEM 1. Business

Overview

We are a clinical stage biopharmaceutical company focused on discovering and developing novel, controllable cellular immunotherapies for the treatment of various forms of cancer. We are advancing CAR-T cell therapies, which are an innovative approach in which a patient's or donor's T cells are genetically modified to carry chimeric antigen receptors, or CARs. We are using our proprietary Chemical Induction of Dimerization, or CID, technology platform to engineer our product candidates with switch technologies that are designed to control components of the immune system in real time. By incorporating our CID platform, our product candidates may offer better efficacy and safety outcomes than are seen with current cellular immunotherapies.

Cell behavior is controlled by cascades of specialized signaling proteins. CID consists of molecular switches, modified forms of these signaling proteins, which are triggered inside the patient by infusion of a small molecule, instead of by natural upstream signals. We genetically introduce these molecular switches into immune cells and deliver the cells to the patient in the manner of conventional cellular immunotherapy. We have developed two such switches: an "activation switch," designed to stimulate activation, proliferation and persistence of the CAR-T cells and provide other immunomodulatory benefits, and a "safety switch," designed to initiate programmed cell death, or apoptosis, of the CAR-T cells. Each of our product candidates incorporates one or both switches, for enhanced, real time control of efficacy and safety:

- The inducible MyD88/CD40 (iMC) activation switch that is incorporated into our GoCAR-T product candidates is designed to enhance CAR-T therapies by augmenting multiple mechanisms of action, including: 1) boosting effector cell proliferation; 2) enhancing functional persistence by resisting exhaustion and inhibitory signals found in the tumor microenvironment; and 3) stimulating the cancer patient's own immune system to intensify tumor killing. Unlike other CAR-T therapies that can behave unpredictably due to their autonomous activity, GoCAR-T antitumor effects are controlled through scheduled administration of rimiducid. In the event of severe side effects, GoCAR-T activity can be attenuated by extending the interval between rimiducid doses or suspending further rimiducid administration.

- Our CaspaCIDe™ safety switch (also known as inducible Caspase-9, or iC9) is designed to be inactive unless the patient experiences a serious side effect (e.g., CRS, neurologic toxicities or off-tumor / on-target toxicities). In that event, rimiducid or temsirolimus (depending on the design of the product candidate) is administered to induce Caspase-9 and eliminate the cells, with the goal of attenuating the therapy and resolving the serious side effect.

- Some of our product candidates are "dual-switch" GoCAR-Ts that are designed to provide a user-controlled system for managing proliferation, persistence and safety of tumor antigen-specific CAR-T cells by incorporating both our iMC and CaspaCIDe switches.

By incorporating our novel switch technologies, we are developing product candidates with the potential to elicit positive clinical outcomes and ultimately change the treatment paradigm in various areas of cellular immunotherapy. Our most advanced programs are described below.

- **BPX-601** is an autologous GoCAR-T product candidate containing our proprietary iMC activation switch, designed to treat solid tumors expressing prostate stem cell antigen, or PSCA. We believe iMC enhances T cell proliferation and persistence, enhances host immune activity, and modulates the tumor microenvironment to improve the potential to treat solid tumors compared to traditional CAR-T therapies. A Phase 1/2 clinical trial, called BP-012, in patients with metastatic castration-resistant prostate cancer and metastatic pancreatic cancer expressing PSCA is ongoing.

- **BPX-603** is an autologous dual-switch GoCAR-T product candidate containing both the iMC activation and CaspaCIDe safety switches. BPX-603 is our first dual-switch GoCAR-T product candidate and is designed to target solid tumors that express the human epidermal growth factor receptor 2 antigen, or HER2. The first patient was enrolled in a Phase 1/2 trial, called BPX603-201A, in December 2020.

- **Rivo-cel (rivogenlecleucel, formerly known as BPX-501)**, is an allogeneic T cell product candidate containing our proprietary CaspaCIDe safety switch that is intended to improve outcomes when administered after hematopoietic stem cell transplantation in the treatment of hematologic malignancies and inherited blood disorders. We are pursuing a strategic partner for rivo-cel to assume future development and commercialization responsibilities. Concurrently, we have reduced and expect to continue to reduce our rivo-cel related activities.

We have developed efficient and scalable processes to manufacture genetically modified T cells of high quality, which are currently being used to generate products for our clinical trials. We are leveraging this know how in combination with our proprietary cellular control technologies, resources, capabilities and expertise for the manufacture of CAR-T product candidates to create and develop first and best-in-class product candidates.

Cellular Immunotherapy

Cellular immunotherapy harnesses immune cells to attack and eliminate harmful diseased cells in the body. The immune system is the body's defense network. It consists of a number of cells (e.g., leukocytes) and organs that, working together, recognize and respond to threats in the form of pathogens-modified or transformed cells. T cells are a type of white blood cell that recognize pathogens and can target and eliminate them upon full activation through the addition of appropriate co-stimulatory signals.

CAR-T approaches entail collecting a patient's or donor's T cells, genetically modifying them ex vivo, or outside of the body, to incorporate specific receptors which target cancer cells and then infusing the modified cells into the patient. CARs are designed to target antigens on the surface of cancer cells. In early human clinical trials, CAR-T cell therapies have demonstrated an unprecedented ability to achieve complete responses in some hematological cancers, even in patients who have suffered multiple relapses.

While high objective response rates have been reported in some hematological malignancies, CAR-T therapy has shown limited clinical efficacy in solid tumors. This is likely due to poor proliferation and persistence of these cells and to immune suppressive factors found in the tumor microenvironment. In addition, patients treated with CAR-T cell therapies can have serious and sometimes fatal toxicities, which can be caused by high levels of activation of the CAR-T therapy, which can lead to severe cytokine release syndrome, or CRS, and neurologic toxicities. Furthermore, CAR-T therapies have the potential to attack healthy tissues (i.e., "on-target/off-tumor" toxicities) which can also result in death.

Our Proprietary CID Technology Platform

Our proprietary CID technology platform is designed to address the challenges of current cellular immunotherapies. Cellular activities and functions, such as growth, activation, proliferation and cell death, are controlled by signaling cascades following aggregation of specific proteins. Our CID platform consists of molecular switches, modified forms of these signaling proteins, which are triggered inside the patient by infusion of a small molecule, rimiducid or temsirolimus, instead of by natural upstream signals. Our current product candidates are based on either an "activation switch", a "safety switch," or a "dual switch" which contains both activation and safety switches. After the small molecule is administered, the "safety switch" is designed to lead to apoptosis, and the "activation switch" is designed to lead to proliferation, activation and enhanced persistence of immune cells.

We incorporate the molecular switches in the appropriate immune cells through genetic manipulation and administer them to the patient. After the gene-modified immune cells are inside the patient's body, specific functions of these cells may be controlled by administration of small molecule ligands (rimiducid or temsirolimus). The CID switch proteins have been designed to specifically bind to rimiducid or temsirolimus. Once introduced, these ligands couple, or aggregate, CID switch proteins together to create a cluster that triggers the signaling cascade. Aside from its impact on CID-modified immune cells bearing switch proteins, rimiducid is bioinert and has no other known effect on the body. In dual-switch applications, temsirolimus can be used to activate a safety switch, if severe, treatment-related toxicities occur. Temsirolimus is a kinase inhibitor approved for the treatment of advanced renal cell carcinoma that has a well-characterized safety profile.

Our proprietary CID-based product candidates depend on the following signaling molecules to trigger signaling cascades, resulting in different cell activities:

a. **iMC: Signaling Molecules for Activation and Proliferation.** iMC is also known as inducible MyD88 and CD40. Myeloid differentiation primary response 88, or MyD88, is a protein that has functions in cellular responses to stimuli such as stress, cytokines and bacteria or viruses. CD40 is a co-stimulatory protein found on antigen-presenting cells, such as dendritic cells and B cells and is required for their full activation. Activation of iMC in immune cells, such as T lymphocytes, provides inducible co-stimulation, leading to enhanced cell proliferation and survival. In addition, activation of iMC causes immune cells to secrete pro-inflammatory cytokines and chemokines, and to express co-stimulatory cell surface molecules to potentially modulate the tumor microenvironment and stimulate the patient's own immune system.

   Our GoCAR-T technology incorporates our proprietary iMC activation switch that activates CAR-T cells when triggered by both rimiducid and the targeted antigen expressed on the surface of the cancer cells. Current generation CAR-T constructs consist of a CD3 domain and one or more co-stimulatory molecules that are both activated when the CAR-T binds to the cancer antigen, and therefore, function autonomously following infusion. This reliance on an

antigen for activation of the CAR-T cell results in an unpredictable and inherently uncontrollable therapeutic effect. Solid tumor CAR cells, on the other hand, often fail to proliferate or persist at all for more than a few days or weeks and have been largely ineffective. In each situation, the physician has no effective way to intervene to achieve greater consistency once the cells have been administered.

Our GoCAR-T technology is designed to change the current paradigm by placing our proprietary co-activation domain, MC, under rimiducid control. GoCAR-T cells are designed to only be fully activated when exposed to both the cancer cells expressing the target antigen and rimiducid. This separation is designed to control the degree of activation of the CAR-T cells through adjustments to the schedule of rimiducid dosing.

b. **CaspaCIDe: Signaling Molecule for Apoptosis.** CaspaCIDe is also known as inducible Caspase-9. Caspase-9 is the initiating enzyme in the apoptosis pathway. When activated, the dimerization of CaspaCIDe leads to rapid apoptosis of gene-modified T cells. Because CaspaCIDe is designed to be permanently integrated into our cellular therapies, the safety switch has the potential to be available for use long after the initial therapy is delivered. Moreover, preclinical animal studies demonstrate the ability to modulate the elimination of cells containing CaspaCIDe by different rimiducid doses and schedules (i.e., titrated elimination).

CaspaCIDe has been incorporated into several clinical programs. At the American Society of Hematology Annual Meeting in 2018, we presented data on the administration of rimiducid to trigger CaspaCIDe in 24 patients experiencing graft versus host disease (GvHD) refractory to standard treatments after receiving rivo-cel following stem cell transplantation. The best overall GvHD clinical response after rimiducid administration was 70%, with a median time to response of one day.

On March 4, 2021, we announced the first reported case of the use of CaspaCIDe to mitigate a severe CAR T-mediated adverse event refractory to standard of care treatment. The case report was published ahead-of-print in the digital edition of *Blood*, a journal published by the American Society of Hematology, detailing a case from an investigator sponsored trial at the University of North Carolina Lineberger Comprehensive Cancer Center of a CD19 CAR-T containing CaspaCIDe. A patient in the study experienced grade 3-4 immune effector cell-associated neurotoxicity syndrome (ICANS) for 72 hours despite standard care. Within 12 hours of rimiducid administration, ICANS grade improved from 3 to 1 and was fully resolved after four days.

Our Active Product Candidates

BPX-601: GoCAR-T for PSCA+ Solid Tumors

We are developing BPX-601, an autologous GoCAR-T product candidate containing our proprietary iMC activation switch, designed to treat solid tumors expressing prostate stem cell antigen, or PSCA. PSCA is an antigen expressed in several solid tumor indications, including prostate and pancreatic cancer. Pre-clinical data show iMC enhances T cell proliferation and persistence, enhances host immune activity, and modulates the tumor microenvironment to improve the potential to treat solid tumors compared to traditional CAR-T therapies. A Phase 1/2 clinical trial, called BP-012, in patients with metastatic castration-resistance prostate and pancreatic cancer expressing PSCA is ongoing.

BPX-603: Dual-Switch GoCAR-T for HER2+ Solid Tumors

We are developing BPX-603, which is our first controllable dual-switch autologous GoCAR-T product candidate and incorporates both the iMC activation switch and the CaspaCIDe safety switch. BPX-603 is designed to target solid tumors that express the human epidermal growth factor receptor 2 antigen, or HER2. HER2 is a validated antigen for cancer therapies, and academic HER2 CAR-T cell clinical studies have shown evidence of anti-tumor activity. These academic HER2 CAR-T approaches targeting HER2 have been limited by modest clinical efficacy and off-tumor/on-target toxicity. We believe that our dual-switch GoCAR-T technology may be uniquely suited to improve upon these earlier efforts, by driving greater efficacy through iMC activation while enabling clinicians to manage any treatment-emergent toxicities with CaspaCIDe. A Phase 1/2 clinical trial, called BPX603-201A, in patients with metastatic HER2+ solid tumors is ongoing.

Manufacturing, Processing and Delivering to Patients

We have developed efficient and scalable processes to manufacture genetically modified T cells of high quality. We are leveraging the processes we have developed for BPX-601 in combination with our proprietary cellular control technologies, resources, capabilities and expertise for the manufacture of our product candidates to create and develop first and best-in-class product candidates.

Our product candidates require a combination of three critical components: (1) viral vectors with DNA content encoded for our proprietary switch proteins and co-stimulatory and other accessory molecules, (2) patient or healthy donor-derived T cells that are genetically modified by our viral vectors, and (3) the small molecules rimiducid and/or temsirolimus, which activate the switch proteins. Each of these components requires a separate supply chain and shares the same regulatory requirements applicable for biological or chemical materials suitable for human use. Details on each of these components are described below:

a. ***Viral Vectors.*** We use gamma retrovirus to transduce our product candidates. We believe that gamma retrovirus is optimal for cell transduction given that it is an integrating vector that induces long-term gene expression, exhibits high transduction efficiency, has sufficient capacity for DNA content, and has been extensively and safely used in clinical trials.

b. ***Genetically Modified Cells.*** We have designed and refined a proprietary process for cell engineering that has been improved from lab-based open procedures used in academic and research settings to a functionally closed system that is more appropriate for large-scale clinical trials and commercialization. Our systems are designed to be compliant with current guidelines and regulations for cell-based manufacturing in the U.S. and Europe and have been successfully implemented by our third-party manufacturers.

c. ***Small Molecules.*** Rimiducid is a synthetic small molecule that has been rationally designed to trigger the proprietary switch proteins in our CID platform. We have separate third-party manufacturers for the active pharmaceutical ingredient, or API, and the finished drug product. Manufacturers of both the API and finished drug product are licensed to manufacture a variety of marketed drugs worldwide and have been selected based on their ability to provide supplies for our clinical trials and future commercialization. In our dual-switch constructs, the small molecule temsirolimus can be used to trigger one of the two switches. Temsirolimus is an approved and commercially available product manufactured and distributed by Pfizer Inc. under the trade name TORISEL.

We are focused on continuously refining our overall cell therapy supply chain, manufacturing, processing and delivery to patients to be more efficient. Our current process cycles for our autologous product candidates, from collection of white blood cells to infusion of the final product, can be completed in as little as four weeks and are customized to be complementary to the treatment procedure of interest in order to prevent delays or complications.

Intellectual Property

We seek to protect proprietary technology, inventions, and improvements that are commercially important to our business by seeking, maintaining, and defending patent rights, whether developed internally or licensed from third parties. We also seek to rely on regulatory protection afforded through orphan drug designations, data exclusivity, market exclusivity and patent term extensions where available as well as contractual agreements with our academic and commercial partners.

A strategic focus for us has been to identify and license key patents and patent applications that serve to enhance our intellectual property and technology position. Our intellectual property estate includes: (1) claims directed to core CID technologies and components used in our products; (2) claims directed to methods of treatment for therapeutic indications; (3) claims directed to specific products; and (4) claims directed to innovative methods for generating new constructs for genetically engineering T cells. We believe our patent estate, together with our efforts to develop and patent next generation technologies, provides us with a substantial intellectual property position.

As of December 31, 2020, to our knowledge, our patent estate, on a worldwide basis, includes 179 issued patents, 22 of which are in the U.S., and 78 pending patent applications, 22 of which are in the U.S., which we own or for which we have an exclusive, either in its entirety or within our field of use, commercial license. The provisional and pending patent applications and issued patents include composition of matter and method of use claims.

- We have internally developed technology disclosed in six pending utility patent applications in the U.S., one European granted patent validated in eight countries, 22 pending foreign patent applications, and one pending PCT application which that relate to our GoCAR-T technology. If U.S. patents issue from the U.S. applications, the estimated expiration date of the last to expire patent is in 2038. If patents are issued in foreign jurisdictions, the anticipated expiration dates will be in 2038.
- Pursuant to our licenses from Baylor and Ariad, we have exclusive commercial rights to 11 issued U.S. patents expiring in 2024 or later, six pending U.S. utility patent applications, two European granted patents (the first validated in three countries, the second validated in five countries), four issued foreign patents expiring in 2024 or later and three pending patent applications in foreign jurisdictions that relate to our GoCAR-T, rivo-cel and certain of our other technologies. If U.S. patents issue from the currently pending U.S. patent applications, the estimated

expiration date of the last to expire patent is 2031. If patents from the currently pending patent applications are issued in foreign jurisdictions, the estimated expiration dates range from 2024 to 2029.

- Pursuant to our license agreement with Agensys we have exclusive commercial rights for technology to target certain cancer-specific antigens.

The term of individual patents depends upon the legal term of the patents in the countries in which they are obtained. In most countries in which we file, the patent term is 20 years from the date of filing of the first non-provisional application to which priority is claimed. In the U.S., a patent's term may be lengthened by patent term adjustment, which compensates a patentee for administrative delays by the U.S. Patent and Trademark Office, or the USPTO, in granting a patent, or may be shortened if a patent is terminally disclaimed over an earlier-filed patent. The term of a patent that covers an FDA-approved drug or biologic may also be eligible for a patent term restoration of up to five years under the Hatch-Waxman Act, which is designed to compensate for the patent term lost during the FDA regulatory review process. The length of the patent term restoration is calculated based on the length of time the drug or biologic is under regulatory review. A patent term restoration under the Hatch-Waxman Act cannot extend the remaining term of a patent beyond a total of 14 years from the date of product approval and only one patent applicable to an approved drug or biologic may be restored. Moreover, a patent can only be restored once, and thus, if a single patent is applicable to multiple products, it can only be extended based on one product. Similar provisions are available in Europe and certain other foreign jurisdictions to extend the term of a patent that covers an approved drug or biologic. When possible, depending upon the length of clinical trials and other factors involved in the filing of a Biologics License Application, or BLA, we expect to apply for patent term extensions for patents covering our product candidates and their methods of use.

We may rely, in some circumstances, on trade secrets to protect our technology. We seek to protect our proprietary technology and processes, in part, by entering into confidentiality agreements with our employees, consultants, scientific advisors and contractors. We also seek to preserve the integrity and confidentiality of our data and trade secrets by maintaining physical security of our premises and physical and electronic security of our information technology systems. While 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 be independently discovered by competitors. To the extent that our consultants, contractors or collaborators 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.

Our Collaboration and License Agreements

Co-Development and Co-Commercialization Agreement - Adaptimmune

In December 2016, we and Adaptimmune Therapeutics plc, or Adaptimmune entered into a Co-Development and Co-Commercialization Agreement, or the Adaptimmune Agreement, in order to facilitate a staged collaboration to evaluate, develop and commercialize next generation T cell therapies.

Under the Adaptimmune Agreement, the parties agreed to evaluate our GoTCR technology, iMC co-stimulation, with Adaptimmune's affinity-optimized SPEAR® T cells for the potential to create enhanced TCR product candidates. Depending on results of the preclinical proof-of-concept phase, the agreement may progress to a two-target co-development and co-commercialization phase. To the extent necessary, and in furtherance of the parties' proof-of-concept and co-development efforts, the parties granted each other a royalty-free, non-transferable, non-exclusive license covering their respective technologies for purposes of facilitating such proof-of-concept and co-development efforts. In addition, as to covered therapies developed under the Adaptimmune Agreement, the parties granted each other a reciprocal exclusive license for the commercialization of such therapies.

With respect to any joint commercialization of a covered therapy, the parties agreed to negotiate in good faith the commercially reasonable terms of a co-commercialization agreement. The parties also agreed that any such agreement shall provide for, among other things, equal sharing of the costs of any such joint commercialization and the calculation of profit shares as set forth in the Adaptimmune Agreement.

The Adaptimmune Agreement will expire on a country-by-country basis once the parties cease commercialization of the T cell therapies covered by the Adaptimmune Agreement, unless earlier terminated by either party for material breach, non-performance or cessation of development, bankruptcy/insolvency, or failure to progress to co-development phase.

License Agreement - Agensys

In December 2015, we and Agensys, Inc. or Agensys entered into a license agreement, or the Agensys Agreement, pursuant to which (i) Agensys granted us, within the field of cell and gene therapy of diseases in humans, an exclusive, worldwide license and

sublicense to its patent rights directed to PSCA and related antibodies, and (ii) we granted Agensys a non-exclusive, fully paid license to our patents directed to inventions that were made by us in the course of developing our licensed products, solely for use with Agensys therapeutic products containing a soluble antibody that binds to PSCA or, to the extent not based upon our other proprietary technology, to non-therapeutic applications of antibodies not used within the field.

As consideration for the rights granted to us under the Agensys Agreement, we agreed to pay to Agensys a non-refundable upfront fee of $3.0 million. We are also required to make aggregate milestone payments to Agensys of up to (i) $5.0 million upon the first achievement of certain specified clinical milestones for its licensed products, (ii) $50.0 million upon the achievement of certain specified clinical milestones for each licensed product, and (iii) $75.0 million upon the achievement of certain sales milestones for each licensed product. The Agensys Agreement additionally provides that we will pay to Agensys a royalty percentage that ranges from the mid to high single digits based on the level of annual net sales of licensed products by us, our affiliates or permitted sublicensees. The royalty payments are subject to reduction under specified circumstances.

Under the Agensys Agreement, Agensys also was granted the option to obtain an exclusive license, on a product-by-product basis, from us to commercialize in Japan each licensed product developed under the Agensys Agreement that has completed a phase 2 clinical trial. As to each such licensed product, if Agensys or its affiliate, Astellas Pharma, Inc., exercises the option, the Agensys Agreement provides that we will be paid an option exercise fee of $5.0 million. In addition, the Agensys Agreement provides that we will be paid a royalty that ranges from the mid to high single digits based on the level of annual net sales in Japan of each such licensed product. If the option is exercised, the aggregate milestone payments payable by us to Agensys, described above with respect to each licensed product, would be reduced by up to an aggregate of $65.0 million upon the achievement of certain specified clinical and sales milestones.

The Agensys Agreement will terminate upon the expiration of the last royalty term for the products covered by the Agensys Agreement, which is the earlier of (i) the date of expiration or abandonment of the last valid claim within the licensed patent rights covering any licensed products under the Agensys Agreement, (ii) the expiration of regulatory exclusivity as to a licensed product, and (iii) 10 years after the first commercial sale of a licensed product. Either party may terminate the Agensys Agreement upon a material breach by the other party that remains uncured following 60 days after the date of written notice of such breach (or 30 days if such material breach is related to failure to make payment of amounts due under the Agensys Agreement) or upon certain insolvency events. In addition, Agensys may terminate the Agensys Agreement immediately upon written notice to us if we or any of our affiliates or permitted sublicensees commence an interference proceeding or challenge the validity or enforceability of any of Agensys' patent rights.

License Agreement - BioVec

In June 2015, we and BioVec Pharma, Inc., or BioVec, entered into a license agreement, or the BioVec Agreement, pursuant to which BioVec agreed to supply us with certain proprietary cell lines and granted us a non-exclusive, worldwide license to certain of its patent rights and related know-how related to such proprietary cell lines.

As consideration for the products supplied and rights granted to us under the BioVec Agreement, we agreed to pay to BioVec an upfront fee of $100,000 within ten business days of the effective date of the BioVec Agreement and a fee of $300,000 within ten business days of its receipt of the first release of GMP lot of the products licensed under the BioVec Agreement. In addition, we agreed to pay to BioVec an annual fee of $150,000, commencing 30 days following the first filing of an IND, or its foreign equivalent, for a product covered by the license; with such annual fees being creditable against any royalties payable by us to BioVec under the BioVec Agreement. We also are required to make a $250,000 milestone payment to BioVec for each of the first three licensed products to enter into a clinical phase trial and one-time milestone payments of $2.0 million upon receipt of a registration granted by the FDA or EMA on each of our first three licensed products. The BioVec Agreement additionally provides that we will pay to BioVec a royalty in the low single digits on net sales of products covered by the BioVec Agreement. We may also grant sub licenses under the licensed patent rights and know-how to third parties for limited purposes related to the use, sale and other exploitation of the products licensed under the BioVec Agreement. The BioVec Agreement will continue until terminated. The BioVec Agreement may be terminated by us, in our sole discretion, at any time upon 90 days written notice to BioVec. Either party may terminate the BioVec Agreement in the event of a breach by the other party of any material provision of the BioVec Agreement that remains uncured on the date that is 60 days after written notice of such failure or upon certain insolvency events that remain uncured following the date that is 30 days after the date of written notice to a party regarding such insolvency event.

License Agreements - Baylor College of Medicine

2008 Baylor License Agreement

Pursuant to an Exclusive License Agreement with Baylor College of Medicine, or Baylor, dated March 20, 2008, or the 2008 Baylor license agreement, we obtained an exclusive, worldwide and fully paid up license to certain intellectual property, including

intellectual property related to methods for activating antigen presenting cells and to genetic constructs coding for membrane bound inducible cytoplasmic CD40.

As consideration for the 2008 Baylor license agreement, we issued to Baylor 23,529 shares of our common stock and assumed responsibility for all legal fees and expenses, filing or maintenance fees, assessments and all other costs and expenses related to prosecuting, obtaining and maintaining patent protection on the patents subject to the 2008 Baylor license agreement.

The 2008 Baylor license agreement is subject to certain restrictions and is nonexclusive with respect to (1) the making or use of the licensed intellectual property for use in non-commercial research, patient care, teaching, and other educational purposes; (2) any non-exclusive license covering the licensed intellectual property that Baylor grants to other academic or research institutions for noncommercial research purposes; (3) any non-exclusive licenses that Baylor is required to grant to the U.S. or foreign state pursuant to an existing or future treaty with the U.S.; and (4) a non-exclusive license granted to ARIAD Pharmaceuticals, Inc. or ARIAD under the terms of a materials transfer agreement between Baylor and ARIAD.

Baylor may terminate or modify the 2008 Baylor license agreement in the event of a material breach by us that remains uncured following the date that is 90 days after written notice of such breach or upon certain insolvency events that remain uncured following the date that is 30 days following written notice of such insolvency event. We may terminate the 2008 Baylor license agreement, or any portion thereof, at our sole discretion at any time upon 30 days' written notice to Baylor. Upon termination of the 2008 Baylor license agreement, all rights to the intellectual property immediately revert to Baylor.

2010 Baylor License Agreement

Pursuant to an Exclusive License Agreement with Baylor, dated June 27, 2010, or the 2010 Baylor license agreement, we obtained an exclusive, worldwide license to certain intellectual property, including intellectual property related to methods for treating prostate cancer, methods of administering T cells to a patient, and methods of activating antigen presenting cells with constructs comprising MyD88 and CD40.

Pursuant to the terms of the 2010 Baylor license agreement we are required to pay a low annual maintenance fee on each anniversary of the agreement date.

The terms of the 2010 Baylor license agreement also require us to make royalty payments of less than one percent, subject to certain annual minimums, on net sales of products covered by the license. In addition, to the extent we enter into a sublicensing agreement relating to a licensed product, we are required to pay Baylor a percentage in the mid-single digits on all non-royalty income received from sublicensing revenue. Bellicum is required to make milestone payments, of up to $735,000 in aggregate, upon successful completion of clinical and regulatory milestones regarding the first two products covered by this license.

The 2010 Baylor license agreement will expire upon expiration of the last patent contained in the licensed patent rights, on a country-by-country basis, upon which we will have a perpetual, paid-in-full license in such country. Baylor may terminate or modify the 2010 Baylor license agreement in the event of a material breach by us that remains uncured following the date that is 90 days after written notice of such breach or upon certain insolvency events that remain uncured following the date that is 30 days following written notice of such insolvency event. We may terminate the 2010 Baylor license agreement, or any portion thereof, at our sole discretion at any time upon 60 days' written notice to Baylor. Upon termination of the 2010 Baylor license agreement for any reason prior to expiration, we must assign to Baylor each authorized sublicense agreement that is currently in effect on the date of termination.

2014 Baylor License Agreement

Pursuant to an Exclusive License Agreement with Baylor, effective November 1, 2014, or the 2014 Baylor license agreement, we obtained an exclusive, worldwide license to certain intellectual property, including intellectual property related to methods for inducing selective apoptosis.

Pursuant to the terms of the 2014 Baylor license agreement we are required to pay Baylor a low annual maintenance fee on each anniversary of the agreement date. The terms of the 2014 Baylor license agreement also require us to make royalty payments in the low single digits, subject to certain annual minimums, on net sales of products covered by the license. To the extent we enter into a sublicensing agreement relating to a licensed product, Bellicum is also required to pay Baylor a percentage in the low double-digits on all non-royalty income received from sublicensing revenue. We are required to make milestone payments, of up to $275,000 in aggregate, upon successful completion of clinical and regulatory milestones regarding the first product covered by this license. The 2014 Baylor license agreement will expire upon expiration of the last patent contained in the licensed patent rights, on a country-by-country basis, upon which we will have a perpetual, paid-in-full license in each such country.

Baylor may terminate or modify the 2014 Baylor license agreement in the event of a material breach by us that remains uncured following the date that is 90 days after written notice of such breach or upon certain insolvency events that remain uncured following the date that is 30 days following written notice of such insolvency event. We may terminate the 2014 Baylor license agreement, or any portion thereof, at our sole discretion at any time upon 60 days' written notice to Baylor.

2016 Baylor License Agreements

In March 2016, we and Baylor entered into two additional license agreements pursuant to which we obtained exclusive rights to technologies and patent rights owned by Baylor. We could incur additional payments upon the achievement of certain milestone events as set forth in the agreements. If we are successful in developing any of the licensed technologies under either agreement, resulting sales would be subject to a royalty payment in the low single digits.

Grant Agreements

Grant Agreements with Cancer Prevention and Research Institute of Texas

In July 2011, we entered into a Cancer Research Grant Contract, or the First Grant Contract, with the Cancer Prevention and Research Institute of Texas, or CPRIT, under which CPRIT awarded a grant not to exceed approximately $5.7 million to be used for the execution of defined clinical development of rivo-cel. To date, we have received approximately $4.9 million under the grant. The First Grant Contract terminated on June 30, 2014, but obligations exist as to licensing, royalty payments, and indemnification provisions.

In November 2016, we announced that the Company received notice of a product development award totaling approximately $16.9 million from CPRIT. The CPRIT award was expected to fund a portion of a three-year global clinical program comprising clinical trials for adult and pediatric patients with high-risk and intermediate-risk AML, and potentially other hematologic cancers. The proposed studies are designed to evaluate the benefit of rivo-cel and rimiducid in the context of in vivo and ex vivo T cell depleted haploidentical HSCT. The CPRIT oversight committee met in February 2017 and agreed to move forward with the proposed terms of the grant agreement, and a second grant, or the Second Grant Contract was entered into in August 2017. Additionally, the First Grant Contract was amended in order to align revenue sharing terms, discussed below, with the Second Grant Contract. We initiated a pivotal randomized Phase 2/3 clinical trial (THRIVE) supported in part by the CPRIT funding.

In January 2020, we terminated the Second Grant Contract based on our decision to cease enrollment of the THRIVE trial. A total of approximately $3.3 million in grant funds was received and used for the project. No additional funds will be disbursed under this grant, but the revenue share and other post-grant obligations described below survive the termination.

Pursuant to the terms of each of the Grant Contracts, we grant to CPRIT a non-exclusive, irrevocable, royalty-free, perpetual, worldwide license to any technology and intellectual property resulting from the grant-funded activities and any other intellectual property that is owned by us and necessary for the exploitation of the technology and intellectual property resulting from the grant-funded activities, or the Project Results, for and on behalf of CPRIT and other governmental entities and agencies of the State of Texas and private or independent institutions of higher education located in Texas for education, research and other non-commercial purposes only. The terms of each of the Grant Contracts require that we pay tiered royalties in the low- to mid-single digit percentages on revenues from sales and licenses of products or services that are based upon, utilize, are developed from or materially incorporate Project Results. Such royalties reduce to less than one percent after a mid-single-digit multiple of the grant funds have been repaid to CPRIT in royalties. Such royalties are payable for so long as we have marketing exclusivity or patents covering the applicable product or service (or twelve years from first commercial sale of such product or service in certain countries if there is no such exclusivity or patent protection).

If we abandon patent applications or patents covering Project Results in certain major market countries, CPRIT can, at its own cost, take over the prosecution and maintenance of such patents and is granted a non-exclusive, irrevocable, royalty-free, perpetual license with right to sublicense in such country to the applicable Project Results. We are required to use diligent and commercially reasonable efforts to commercialize at least one commercial product or service or otherwise bring to practical application the Project Results. If CPRIT notifies us of our failure with respect to the foregoing, and such failure is not owing to material safety concerns, then, at CPRIT's option, the applicable Project Results would be transferred to CPRIT and CPRIT would be granted a non-exclusive license to any other intellectual property that is owned by us and necessary for the exploitation of the Project Results, and CPRIT, at its own cost, can commercialize products or services that are based upon, utilize, are developed from or materially incorporate Project Results. CPRIT's option is subject to our ability to cure any failures identified by CPRIT within 60 days and a requirement to negotiate in good faith with us with respect to an alternative commercialization strategy for a period of 180 days.

Competition

The biopharmaceutical industry is characterized by intense and dynamic competition to develop new technologies and proprietary therapies. Any product candidates that we successfully develop and commercialize will have to compete with existing therapies and new therapies that may become available in the future. While we believe that our proprietary CID platform, differentiated product candidates and scientific expertise in the field of cellular immunotherapy provide us with competitive advantages, we face potential competition from various sources, including larger and better-funded pharmaceutical, specialty pharmaceutical and biotechnology companies, as well as from academic institutions, governmental agencies and public and private research institutions.

Cell based treatments for cancer, such as CAR-T therapies, have recently been an area of significant research and development by academic institutions and biopharmaceutical companies. Our product candidates may compete with product candidates from a number of companies that are currently focused on this therapeutic modality, including Adaptimmune, Allogene Therapeutics, Inc., Amgen Inc., Atara Biotherapeutics, Inc., Autolus Therapeutics plc, bluebird bio, Inc., Bristol-Meyer Squibb Co., Cellectis SA, Celyad S.A., Fate Therapeutics Inc., GlaxoSmithKline plc, Gilead Sciences, Inc., Iovance Biotherapeutics, Inc., Janssen Pharmaceutical, Kuur Therapeutics, Legend Biotech, Lyell Immunopharma, Inc., Medigene AG, MolMed S.p.A., Mustang Bio, Inc., Novartis AG, Obsidian Therapeutics, Poseida Therapeutics, Precigen Inc., Precision Biosciences, Inc., Sorrento Therapeutics, Inc., Takeda Pharmaceutical Co, and Ziopharm Oncology.

Many of our competitors, either alone or with their strategic partners, have substantially greater financial, technical and human resources than we do and significantly greater experience in the discovery and development of product candidates, obtaining FDA and other regulatory approvals of treatments and commercializing those treatments. Accordingly, our competitors may be more successful than us in obtaining approval for treatments and achieving widespread market acceptance. Our competitors' treatments may be more effective, or more effectively marketed and sold, than any treatment we may commercialize and may render our treatments obsolete or non-competitive before we can recover the expenses of developing and commercializing any of our treatments.

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

We anticipate that we will face intense and increasing competition as new drugs enter the market and advanced technologies become available. We expect any treatments that we develop and commercialize to compete on the basis of, among other things, efficacy, safety, convenience of administration and delivery, price, the level of generic competition and the availability of reimbursement from government and other third-party payers. For example, if a third party is able to obtain a stand-alone new drug application for rimiducid, then potential generic manufacturers may be able to file abbreviated new drug applications for that product.

Our commercial opportunity could be reduced or eliminated if our competitors develop and commercialize products that are safer, more effective, have fewer or less severe side effects, are more convenient or are less expensive than any products that we may develop. Our competitors also may obtain FDA or other regulatory approval for their products more rapidly than we may obtain approval for ours, which could result in our competitors establishing a strong market position before we are able to enter the market. In addition, we expect that our therapeutic products, if approved, will be priced at a significant premium over competitive generic products and our ability to compete may be affected in many cases by insurers or other third-party payers seeking to encourage the use of generic products.

Government Regulation and Product Approval

As a biopharmaceutical company that operates in the U.S., we are subject to extensive regulation. Our cell products will be regulated as biologics. With this classification, commercial production of our products will need to occur in registered and licensed facilities in compliance with the current good manufacturing practice, or cGMP, for biologics.

The FDA regulates human cells, tissues, and cellular and tissue-based products, or HCT/Ps, under a two-tiered framework, based on risk categorization. Higher-risk HCT/Ps are regulated as biologics. For example, such products must complete extensive clinical trials, which must be conducted pursuant to an effective IND. The FDA must review and approve a Biologics License Application, or BLA before a new biologic may be marketed.

The FDA considers our investigational products to be "combination products" because our products involve a biologic, the engineered cells, that is intended to be used with a small molecule chemical drug, rimiducid. In general, biologics such as our engineered cells are regulated through the FDA's Center for Biologics Evaluation and Research, or CBER, while synthetic drugs are regulated through the FDA's Center for Drug Evaluation and Research. When the FDA encounters a combination product such as our products, the agency determines which of the two centers will have primary responsibility for regulating the product by determining the primary mode of action for the product. The cellular component of our combination contributes the primary mode of action and, as a result, the FDA will regulate our investigational products as biologics, through CBER.

Government authorities in the U.S., at the federal, state and local levels, and in other countries extensively regulate, among other things, the research, development, testing, manufacturing, quality control, approval, labeling, packaging, storage, record-keeping, promotion, advertising, distribution, post-approval monitoring and reporting, marketing and export and import of biopharmaceutical products such as those we are developing. Our product candidates must be approved by the FDA before they may be legally marketed in the U.S. and by the appropriate foreign regulatory agency before they may be legally marketed in foreign countries. Generally, our activities in other countries will be subject to regulation that is similar in nature and scope as that imposed in the U.S., although there can be important differences. Additionally, some significant aspects of regulation in Europe are addressed in a centralized way, but country-specific regulation remains essential in many respects.

U.S. Product Development Process

In the U.S., the FDA regulates new drugs and biological products under the Federal Food, Drug and Cosmetic Act, or FDCA, the Public Health Service Act, or PHSA, and implementing regulations. Products are also subject to other federal, state and local statutes and regulations. The FDA has limited experience with commercial development of T cell therapies for cancer. The process required by the FDA before a biological product may be marketed in the U.S. generally involves the following:

a. completion of nonclinical laboratory tests and animal studies according to good laboratory practices, or GLPs, and applicable requirements for the humane use of laboratory animals or other applicable regulations;

b. submission to the FDA of an IND, which must become effective before human clinical trials may begin;

c. performance of adequate and well-controlled human clinical trials according to the FDA's regulations commonly referred to as good clinical practices, or GCPs, and any additional requirements for the protection of human research patients and their health information, to establish the safety and efficacy of the proposed biological product for its intended use;

d. submission to the FDA of a BLA for marketing approval that includes substantial evidence of safety, purity, and potency from results of nonclinical testing and clinical trials;

e. satisfactory completion of an FDA inspection of the manufacturing facility or facilities where the biological product is produced to assess compliance with cGMP, to assure that the facilities, methods and controls are adequate to preserve the biological product's identity, strength, quality and purity and, if applicable, the FDA's current good tissue practices, or GTPs, for the use of HCT/Ps;

f. potential FDA audit of the nonclinical study and clinical trial sites that generated the data in support of the BLA; and

g. FDA review and approval, or licensure, of the BLA.

Before testing any biological product candidate, including our product candidates, 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. The clinical trial sponsor must submit the results of the preclinical tests, together with manufacturing information, analytical data, any available clinical data or literature and a proposed clinical protocol, to the FDA as part of the IND. Some preclinical testing may continue even after the IND is submitted. The IND automatically becomes effective 30 days after receipt by the FDA unless the FDA raises concerns or questions regarding the proposed clinical trials and places the trial on a clinical hold within that 30-day time period. In such a case, the IND sponsor must resolve FDA's outstanding concerns before the clinical trial can begin. The FDA may also impose clinical holds on a biological product candidate at any time before or during clinical trials due to safety concerns or non-compliance. If the FDA imposes a clinical hold, trials may not recommence without FDA authorization and then only under terms authorized by the FDA. Accordingly, we cannot be sure that submission of an IND will result in the FDA allowing clinical trials to begin, or that, once begun, issues will not arise that suspend or terminate such clinical trials.

Clinical trials involve the administration of the biological product candidate to healthy volunteers or patients under the supervision of qualified investigators, generally physicians not employed by or under the trial sponsor's control. Clinical trials are conducted under protocols detailing, among other things, the objectives of the clinical trial, dosing procedures, subject selection and exclusion criteria, and the parameters to be used to monitor subject safety, including stopping rules that assure a clinical trial will be stopped if certain adverse events should occur. Each protocol and any amendments to the protocol must be submitted to the FDA as part of the IND. Clinical trials must be conducted and monitored in accordance with the FDA's regulations comprising the GCP requirements, including the requirement that all research patients provide informed consent. Further, each clinical trial must be reviewed and approved by an institutional review board, or IRB, at or servicing each institution at which the clinical trial will be conducted. An IRB is independent from the trial sponsor and is charged with protecting the welfare and rights of clinical trial participants and considers such items as whether the risks to individuals participating in the clinical trials are minimized and are reasonable in relation to anticipated benefits. The IRB also approves the form and content of the informed consent that must be signed by each clinical trial subject or his or her legal representative and must monitor the clinical trial until completed. Clinical trials also must be reviewed by an institutional biosafety committee, or IBC, a local institutional committee that reviews and oversees basic and clinical research conducted at that institution. The IBC assesses the safety of the research and identifies any potential risk to public health or the environment.

Human clinical trials for biologic products are typically conducted in three sequential phases that may overlap or be combined:

a. *Phase 1*. The biological product is initially introduced into healthy human subjects and tested for safety. In the case of some products for severe or life-threatening diseases, especially when the product may be too inherently toxic to ethically administer to healthy volunteers, the initial human testing is often conducted in patients.

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

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

Post-approval clinical trials, sometimes referred to as Phase 4 clinical trials, may be conducted after initial marketing approval. These clinical trials are used to gain additional experience from the treatment of patients in the intended therapeutic indication, particularly for long-term safety follow-up.

During all phases of clinical development, regulatory agencies require extensive monitoring and auditing of all clinical activities, clinical data, and clinical trial investigators. Annual progress reports detailing the progress of the clinical trials must be submitted to the FDA. Written IND safety reports must be promptly submitted to the FDA and the investigators for serious and unexpected adverse events, any findings from other studies, tests in laboratory animals or *in vitro* testing that suggest a significant risk for human patients, or any clinically important increase in the rate of a serious suspected adverse reaction over that listed in the protocol or investigator brochure. The sponsor must submit an IND safety report within 15 calendar days after the sponsor determines that the information qualifies for reporting. The sponsor also must notify the FDA of any unexpected fatal or life-threatening suspected adverse reaction within seven calendar days after the sponsor's initial receipt of the information. Phase 1, Phase 2 and Phase 3 clinical trials may not be completed successfully within any specified period, if at all. The FDA or the sponsor or its data safety monitoring board may suspend or terminate a clinical trial at any time on various grounds, including a finding that the research patients are being exposed to an unacceptable health risk, including risks inferred from other unrelated immunotherapy trials. Similarly, an IRB can suspend or terminate approval of a clinical trial at its institution if the clinical trial is not being conducted in accordance with the IRB's requirements or if the biological product has been associated with unexpected serious harm to patients.

Concurrently with clinical trials, companies usually complete additional studies and must also develop additional information about the physical characteristics of the biological product, as well as finalize a process for manufacturing the product in commercial quantities in accordance with cGMP requirements. To help reduce the risk of the introduction of adventitious agents with use of biological products, the PHSA emphasizes the importance of manufacturing control for products whose attributes cannot be precisely defined. The manufacturing process must be capable of consistently producing quality batches of the product candidate and, among other things, the sponsor must develop methods for testing the identity, strength, quality, potency and purity of the final biological product. Additionally, appropriate packaging must be selected and tested, and stability studies must be conducted to demonstrate that the biological product candidate does not undergo unacceptable deterioration over its shelf life.

Federal law requires that we register all of our clinical trials on a publicly accessible website, and accordingly we disclose information on our clinical trials on www.clinicaltrials.gov. We must also provide results information for most of our clinical trials, other than Phase 1 clinical trials.

U.S. Review and Approval Processes

After the completion of clinical trials of a biological product, FDA approval of a BLA must be obtained before commercial marketing of the biological product. The BLA must include results of product development, laboratory and animal studies, human trials, information on the manufacture and composition of the product, proposed labeling and other relevant information. The FDA may grant deferrals for submission of certain data or full or partial waivers. The testing and approval processes require substantial time and effort and there can be no assurance that the FDA will accept the BLA for filing and, even if filed, that any approval will be granted on a timely basis, if at all.

Under the Prescription Drug User Fee Act, or PDUFA, as amended, each BLA must be accompanied by a significant user fee. The FDA adjusts the PDUFA user fees on an annual basis. The PDUFA also imposes an annual program fee for approved biological products. Fee waivers or reductions are available in certain circumstances, including a waiver of the application fee for the first application filed by a small business. Additionally, no user fees are assessed on BLAs for products designated as orphan drugs, unless the application also includes a non-orphan indication.

Within 60 days following submission of the application, the FDA reviews a BLA submitted to determine if it is substantially complete before the agency 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. The resubmitted application also is subject to review before the FDA accepts it for filing. Once the submission is accepted for filing, the FDA begins an in-depth substantive review of the BLA. The FDA reviews the BLA to determine, among other things, whether the proposed product is safe, potent, and/or effective for its intended use, and has an acceptable purity profile, and whether the product is being manufactured in accordance with cGMP to assure and preserve the product's identity, safety, strength, quality, potency and purity. The FDA may refer applications for novel biological products or biological products that present difficult questions of safety or efficacy to an advisory committee, typically a panel that includes clinicians and other experts, for review, evaluation and a recommendation as to whether the application should be approved and under what conditions. The FDA is not bound by the recommendations of an advisory committee, but it considers such recommendations carefully when making decisions. During the biological product approval process, the FDA also will determine whether a Risk Evaluation and Mitigation Strategy, or REMS, is necessary to assure the safe use of the biological product. If the FDA concludes a REMS is needed, the sponsor of the BLA must submit a proposed REMS. The FDA will not approve a BLA without a REMS, if required.

Before approving a BLA, the FDA will inspect the facilities at which the product is manufactured. The FDA will not approve the product unless it determines that the manufacturing processes and facilities are in compliance with cGMP requirements and adequate to assure consistent production of the product within required specifications. For immunotherapy products, the FDA also will not approve the product if the manufacturer is not in compliance with the GTPs, to the extent applicable. These are FDA regulations and guidance documents that govern the methods used in, and the facilities and controls used for, the manufacture of HCT/Ps. 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 HCT/P 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 that the clinical trials were conducted in compliance with IND trial requirements and GCP requirements. To maintain compliance with CGMPs, GTPs, and GCPs, an applicant must incur significant expenditure of time, money and effort in the areas of training, record keeping, production, and quality control.

Notwithstanding the submission of relevant data and information, the FDA may ultimately decide that the BLA does not satisfy its regulatory criteria for approval and deny approval. Data obtained from clinical trials are not always conclusive and the FDA may interpret data differently than we interpret the same data. If the agency decides not to approve the BLA in its present form, the FDA will issue a complete response letter that describes all of the specific deficiencies in the BLA identified by the FDA. The deficiencies identified may be minor, for example, requiring labeling changes, or major, for example, requiring additional clinical trials. Additionally, the complete response letter may include recommended actions that the applicant might take to place the application in a condition for approval. If a complete response letter is issued, the applicant may either resubmit the BLA, addressing all of the deficiencies identified in the letter, or withdraw the application.

If a product receives regulatory approval, the approval may be significantly limited to specific diseases and dosages or the indications for use may otherwise be limited, which could restrict the commercial value of the product.

Further, the FDA may require that certain contraindications, warnings or precautions be included in the product labeling. The FDA may impose restrictions and conditions on product distribution, prescribing, or dispensing in the form of a REMS or other risk management plan, or otherwise limit the scope of any approval. In addition, the FDA may require post marketing clinical

trials, sometimes referred to as Phase 4 clinical trials, designed to further assess a biological product's safety and effectiveness, and testing and surveillance programs to monitor the safety of approved products that have been commercialized.

In addition, under the Pediatric Research Equity Act, or PREA, a BLA or supplement to a BLA must contain data to assess the safety and effectiveness of the product for the claimed indications in all relevant pediatric subpopulations and to support dosing and administration for each pediatric subpopulation for which the product is safe and effective. The FDA may grant deferrals for submission of data or full or partial waivers. Unless otherwise required by regulation, the PREA does not apply to any product for an indication for which orphan designation has been granted. However, if only one indication for a product has orphan designation, a pediatric assessment may still be required for any applications to market that same product for the non-orphan indication(s). Sponsors in satisfaction of this obligation may receive an additional six months of marketing exclusivity for all dosage forms and all indications with the same active moiety as the drug studied.

Orphan Drug Designation

Under the Orphan Drug Act, the FDA may grant orphan designation to a drug or biologic intended to treat a rare disease or condition, which is generally a disease or condition that affects fewer than 200,000 individuals in the U.S., or more than 200,000 individuals in the U.S. and for which there is no reasonable expectation that the cost of developing and making available in the U.S. a drug or biologic for this type of disease or condition will be recovered from sales in the U.S. 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. The orphan drug designation does not shorten the duration of the regulatory review or approval process, but does provide certain advantages, such as a waiver of PDUFA fees, enhanced access to FDA staff, and potential waiver of the PREA requirements discussed above.

If a product that has orphan drug designation subsequently receives the first FDA approval 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. Orphan drug exclusivity does not prevent 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. Among the other benefits of orphan drug designation are tax credits for certain research and a waiver of the BLA application user fee.

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, exclusive marketing rights in the U.S. may be lost if the FDA later determines that the request for designation was materially defective or if the manufacturer is unable to assure sufficient quantities of the product to meet the needs of patients with the rare disease or condition.

Expedited Development and Review Programs

The FDA has a Fast Track program that is intended to expedite or facilitate the process for reviewing new products that meet certain criteria. Specifically, new 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, or if the drug has been designated as a qualified infectious disease product. Fast Track designation applies to the combination of the product and the specific indication for which it is being studied. Under Fast Track, 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. Even if Fast Track designation is granted, it may be rescinded if the product no longer meets the qualifying criteria.

Any product, submitted to the FDA for approval, including a product with a Fast Track designation, may also be eligible for other types of FDA programs intended to expedite development and review, such as priority review and accelerated approval. A product is eligible for priority review if it treats a serious condition and, if approved, would provide a significant improvement in safety and efficacy. The FDA will attempt to direct additional resources to the evaluation of an application for a new product designated for priority review in an effort to facilitate the review. Additionally, a product may be eligible for accelerated approval. Products 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 treats a serious condition, provides a meaningful advantage over available therapies, and demonstrates 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 approval, the FDA may require that a sponsor of a drug or biological product receiving accelerated approval perform appropriate post-marketing clinical studies to verify and

describe the predicted effect on irreversible morbidity or mortality or other 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. The FDCA also provides expedited procedures for FDA withdrawal of approval of a product approved through accelerated approval. Fast Track designation, priority review and accelerated approval do not change the standards for approval but may expedite the development or approval process.

Breakthrough Therapy Designation is intended to expedite the development and review of products that treat serious or life-threatening conditions. The designation requires preliminary clinical evidence that may demonstrate substantial improvement on a clinically significant endpoint over available therapies. The designation includes all of the Fast Track program features, as well as more intensive FDA interaction and guidance, organizational commitment, and other potential actions to expedite review. The Breakthrough Therapy Designation is a distinct status from both accelerated approval and priority review, which can also be granted to the same product if relevant criteria are met. If a product is designated as breakthrough therapy, the FDA will expedite the development and review of such product. Even if a Breakthrough Therapy Designation is granted, it may be rescinded if the product no longer meets the qualifying criteria.

Other U.S. Health Care Laws and Compliance Requirements

In the U.S., our activities are potentially subject to regulation by various federal, state and local authorities in addition to the FDA, including but not limited to, the Centers for Medicare and Medicaid Services, or CMS, other divisions of the U.S. Department of Health and Human Services, or HHS, such as the Office of Inspector General, the U.S. Department of Justice, or DOJ, and individual U.S. Attorney offices within the DOJ, and state and local governments. For example, sales, marketing and scientific/educational grant programs must comply with the anti-fraud and abuse provisions of the Social Security Act, the false claims laws, the privacy provisions of the Health Insurance Portability and Accountability Act, or HIPAA, the sunshine provisions of the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act, collectively, the Affordable Care Act, and similar state laws, each as amended.

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 either the referral of an individual, or for the purchasing, leasing, ordering or arranging for the purchase, lease or order of any good, facility, item or service reimbursable, in whole or in part, under Medicare, Medicaid or other federal health care 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 biologic manufacturers on 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. 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 was amended by the Affordable Care Act 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. The Anti-Kickback Statute may be violated if only one purpose of the remuneration is to induce referrals. In addition, the Affordable Care Act 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 civil False Claims Act.

The civil monetary penalties law imposes penalties against any person or entity who, among other things, is determined to have presented or caused to be presented a claim to a federal health program that the person knows or should know is for an item or service that was not provided as claimed or is false or fraudulent.

The federal false claims laws, including but not limited to the federal civil False Claims Act, prohibit, 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. Pharmaceutical and other health care 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. Other companies have been prosecuted for causing false claims to be submitted because of the companies' marketing of the product for unapproved, that is, off-label, and thus non-reimbursable, uses.

HIPAA created additional 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 health care 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 health care 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.

We may 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, or HITECH, and their implementing regulations, imposes requirements relating to the privacy, security and transmission of individually identifiable health information. Among other things, HITECH makes HIPAA's 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, and their covered subcontractors. 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.

Additionally, the federal Physician Payments Sunshine Act, 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, to report annually 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, or to entities or individuals at the request of, or designated on behalf of, the physicians and teaching hospitals and require that certain manufacturers and group purchasing organizations report annually certain ownership and investment interests held by physicians and their immediate family members. Beginning in 2022, applicable manufacturers will also be required to report information regarding payments and other transfers of value provided during the previous year to physician assistants, nurse practitioners, clinical nurse specialists, certified nurse anesthetists, anesthesiologists assistants, and certified nurse-midwives.

We will also be required to begin satisfying the product tracing, verification, and reporting requirements set out in the Drug Quality and Security Act.

In order to distribute products commercially, we must also comply with state laws that require the registration of manufacturers and wholesale distributors of drug and biological 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.

Several states have enacted legislation requiring pharmaceutical and biotechnology companies to, among other things, establish marketing compliance programs, file periodic reports with the state, make periodic public disclosures on sales, marketing, pricing, clinical trials and other activities, and/or register their sales representatives, as well as to prohibit pharmacies and other health care entities from providing certain physician prescribing data to pharmaceutical and biotechnology 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 laws described above or any other government regulations that apply to us, we may be subject to penalties, including significant administrative, civil and criminal penalties, damages, fines, additional reporting requirements and oversight if we become subject to a corporate integrity agreement or similar agreement to resolve allegations of noncompliance with these laws, exclusion from participation in government health care programs, such as Medicare and Medicaid, disgorgement, contractual damages, reputational harm and the curtailment or restructuring of our operations.

Coverage, Pricing and Reimbursement

Significant uncertainty exists as to the coverage and reimbursement status of any product candidates for which we obtain regulatory approval. In the U.S. and markets in other countries, sales of any products for which we receive regulatory approval for commercial sale will depend, in part, on the extent to which third-party payors provide coverage and establish adequate reimbursement levels for such products. In the U.S., third-party payors include federal and state health care programs, private managed care providers, health insurers and other organizations. The process for determining whether a third-party payor will provide coverage for a product may be separate from the process for setting the price of a product or for establishing the reimbursement rate that such a payor will pay for the product. Third-party payors may limit coverage to specific products on an approved list, also known as a formulary, which might not include all of the FDA-approved products for a particular indication. Third-party payors are increasingly challenging the price, examining the medical necessity and reviewing the cost-effectiveness of

medical products, therapies and services, in addition to questioning their safety and efficacy. We may need to conduct expensive pharmaco-economic studies in order to demonstrate the medical necessity and cost-effectiveness of our products, in addition to the costs required to obtain the FDA approvals. Our product candidates may not be considered medically necessary or cost-effective. A payor's decision to provide coverage for a product does not imply that an adequate reimbursement rate will be approved. Further, one payor's determination to provide coverage for a product does not assure that other payors will also provide coverage for the product. Adequate third-party reimbursement may not be available to enable us to maintain price levels sufficient to realize an appropriate return on our investment in product development.

Different pricing and reimbursement schemes exist in other countries. In the EU, governments influence the price of pharmaceutical products through their pricing and reimbursement rules and control of national health care systems that fund a large part of the cost of those products to consumers. Some jurisdictions operate positive and negative list systems under which products may only be marketed once a reimbursement price has been agreed. To obtain reimbursement or pricing approval, some of these countries may require the completion of clinical trials that compare the cost-effectiveness of a particular product candidate to currently available therapies. Other member states allow companies to fix their own prices for medicines, but monitor and control company profits. The downward pressure on health care costs has become very intense. As a result, increasingly high barriers are being erected to the entry of new products. In addition, in some countries, cross-border imports from low-priced markets exert a commercial pressure on pricing within a country.

The marketability of any product candidates for which we receive regulatory approval for commercial sale may suffer if the government and third-party payors fail to provide adequate coverage and reimbursement. In addition, emphasis on managed care in the U.S. has increased and we expect will continue to increase the pressure on health care pricing. Coverage policies and third-party reimbursement rates may change at any time. Even if favorable coverage and reimbursement status is attained for one or more products for which we receive regulatory approval, less favorable coverage policies and reimbursement rates may be implemented in the future.

Health Reform

In the United States and some foreign jurisdictions, there have been, and we anticipate there will continue to be, several legislative and regulatory changes and proposed healthcare reform measures with the stated goals of containing healthcare costs, improving quality and expanding access. In the United States, the pharmaceutical industry has been a particular focus of these efforts and has been significantly affected by federal and state legislative initiatives, including those designed to limit the pricing, coverage, and reimbursement of pharmaceutical and biopharmaceutical products, especially under government-funded healthcare programs, and increased governmental control of drug pricing. For example, the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act, or collectively, the PPACA, which was enacted in March 2010, substantially changed the way healthcare is financed by both governmental and private insurers, and continues to significantly impact the U.S. pharmaceutical industry. The PPACA remains subject to challenge, and the U.S. Supreme Court is currently reviewing the constitutionality of the PPACA, although it is unclear when a decision will be reached. Moreover, payment methodologies may also be subject to changes in healthcare legislation and regulatory initiatives. 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. It is also possible that additional governmental action will be taken in response to the COVID-19 pandemic.

The Foreign Corrupt Practices Act

The Foreign Corrupt Practices Act, or 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 U.S. to comply with accounting provisions requiring the company 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.

Additional Regulation

In addition to the foregoing, state and federal laws regarding environmental protection and hazardous substances, including the Occupational Safety and Health Act, the Resource Conservancy and Recovery Act and the Toxic Substances Control Act, affect our business. These and other laws govern our use, handling and disposal of various biological, chemical and radioactive substances used in, and wastes generated by, our operations. If our operations result in contamination of the environment or expose individuals to hazardous substances, we could be liable for damages and governmental fines. We believe that we are in material compliance with applicable environmental laws and that continued compliance therewith will not have a material adverse effect on our business. We cannot predict, however, how changes in these laws may affect our future operations.

Employees

As of December 31, 2020, we had 16 employees, all of whom were full-time, 10 of whom were engaged in research and development activities and 6 of whom were engaged in business development, finance, information systems, facilities, human resources or administrative support. None of our employees is subject to a collective bargaining agreement. We consider our relationship with our employees to be good.

Our human capital objectives include, as applicable, identifying, recruiting, retaining, incentivizing and integrating our existing and new employees, advisors and consultants. The principal purposes of our equity and cash incentive plans are to attract, retain and reward personnel through the granting of stock-based and cash-based compensation awards, in order to increase stockholder value and the success of our company by motivating such individuals to perform to the best of their abilities and achieve objectives.

The success of our business is fundamentally connected to the well-being of our employees. Accordingly, we are committed to their health, safety and wellness. We provide our employees and their families with access to a variety of innovative, flexible and convenient health and wellness program, including benefits that provide protection and security so they can have peace of mind concerning events that may require time away from work or that impact their financial well-being; that support their physical and mental health by providing tools and resources to help them improve or maintain their health status and encourage healthy behaviors; and that offer choice where possible so they can customize their benefits to meet their needs and the needs of their families. In response to the COVID-19 pandemic, we implemented significant changes that we determined were in the best interest of our employees, as well as the community in which we operate, and which comply with government regulations, including working from home.

Corporate Information

We were incorporated in Delaware in July 2004. Our principal executive offices are located at 3730 Kirby Drive, Suite 1200, Houston, Texas and our telephone number is (832) 384-1100. Our corporate website address is www.bellicum.com. Our Annual Report on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K, and amendments to reports filed pursuant to Sections 13(a) and 15(d) of the Securities Exchange Act of 1934, as amended, or the Exchange Act, will be made available free of charge on our website as soon as reasonably practicable after we electronically file such material with, or furnish it to, the Securities and Exchange Commission, or the SEC. The contents of our website are not incorporated into this Annual Report and our reference to the URL for our website is intended to be an inactive textual reference only.

Item 1A. Risk Factors

Our business and results of operations are subject to a number of risks and uncertainties. You should carefully consider the following risk factors, as well as the other information in this report, and in our other public filings. The occurrence of any of the following risks could harm our business, financial condition, results of operations and/or growth prospects or cause our actual results to differ materially from those contained in forward-looking statements we have made in this report and those we may make from time to time. You should consider all of the risk factors described when evaluating our business.

Risks Related to Our Business and Industry

We have incurred net losses from operations in every year since our inception and anticipate that we will continue to incur net losses in the future.

We are a clinical stage biopharmaceutical company, have no products approved for commercial sale and have incurred significant losses since our inception in 2004. To date, we have financed our operations primarily through equity and debt financings. For the fiscal years ended December 31, 2020 and 2019, we reported a net loss of $7.7 million and $112.5 million, respectively. As of December 31, 2020, we had an accumulated deficit of $540.7 million. We expect to continue to incur significant losses from operations for the foreseeable future, and we expect these accumulated losses to increase as we continue our research and development of, and seek regulatory approvals for, our product candidates.

In addition, if we obtain regulatory approval of and seek to commercialize any of our product candidates, we will likely incur significant sales, marketing and manufacturing expenses and may continue to incur substantial research and development expenses for additional post-marketing approval development requirements related to such product.

We may encounter unforeseen expenses, difficulties, complications, delays and other unknown factors that may adversely affect our business. The size of our future net losses will depend, in part, on the rate of future growth of our expenses and our ability to generate revenue. Our prior losses and expected future losses have had and will continue to have an adverse effect on our stockholders' equity and working capital.

We will require significant funding to complete the development and commercialization of our product candidates. If we fail to obtain additional financing, we may have to delay, reduce or eliminate our development programs or commercialization efforts.

Our operations have consumed substantial amounts of cash since our inception. We expect to continue to spend substantial amounts to continue the preclinical and clinical development of our product candidates and other research and development programs.

As of December 31, 2020, we had cash, cash equivalents and restricted cash of approximately $37.0 million. We maintain our cash and cash equivalents with high quality, accredited financial institutions. These amounts at times may exceed federally insured limits. Cash, cash equivalents and restricted cash are expected to be sufficient to fund our operating expenses and capital expenditure requirements through at least one year from the financial statement issuance date..

We will need to finance future cash needs through public or private equity offerings, debt financings, strategic partnerships and alliances or licensing arrangements. We cannot be certain that additional funding will be available on acceptable terms, or at all. In addition, the COVID-19 pandemic continues to rapidly evolve and has already resulted in a significant disruption of global financial markets. Our ability to raise additional capital 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 U.S. and worldwide resulting from the pandemic. If the disruption persists and/ or deepens, we could experience an inability to access additional capital, which could in the future negatively affect our capacity to fund research and development programs, including discovery research, preclinical and clinical development activities. In addition, the securities purchase agreement for our August 2019 private placement transaction requires us to obtain investor consent prior to taking a range of corporate financing actions, including issuing equity securities that are senior or pari passu to the Series 3 preferred stock and incurring new debt in excess of $1,000,000. If we are unable to raise additional capital in sufficient amounts or on terms acceptable to us, we will need to significantly delay, scale back or discontinue the development or commercialization of our product candidates. We also could be required to:

- seek collaborators for one or more of our current or future product candidates on terms that are less favorable than might otherwise be available;
- relinquish or license on unfavorable terms our rights to technologies or product candidates that we otherwise would seek to develop or commercialize ourselves; or
- seek a third party to acquire us or our assets.

If we are unable to raise additional funds on a timely basis, we may be required to reduce expenses through the delay, reduction or curtailment of our development programs, or implement further reduction of costs for facilities and administration. For example, in

October 2020, we announced that we implemented a restructuring plan, which included, among other things, a 79% reduction in staff, from 68 to 14 full-time employees, by the end of 2020 and discontinuation of discovery research and new product development. We have incurred $2.5 million in restructuring expenses, including severance expenses of $1.2 million and the Houston office's impairment of $1.3 million. Moreover, if we do not obtain such additional funds, there could be substantial doubt about our ability to continue as a going concern and increased risk of insolvency, which could result in a total loss of investment to our stockholders and other security holders.

The FDA and other regulatory authorities may disagree with our regulatory plans and we may fail to obtain regulatory approval of our product candidates.

Our business and future success depends, in part, on our ability to obtain regulatory authority assent to conduct human clinical trials, obtain regulatory approval to launch a product based on evidence of clinical safety and efficacy and then successfully commercialize our clinical product candidates. All of our product candidates will require additional clinical and non-clinical development, regulatory review and approval in multiple jurisdictions, substantial investment, and access to sufficient commercial manufacturing capacity and significant marketing efforts before we can expect to generate any revenue from product sales.

Our product candidates could fail to receive regulatory approval for many reasons, including the following:

- The FDA or comparable regulatory authority or an Institutional Review Board or comparable ethics oversight body may decline to clear the applicable Investigational New Drug Application (IND) or equivalent regulatory submission necessary to conduct human clinical trials;
- we may be unable to demonstrate to the satisfaction of the FDA or comparable foreign regulatory authorities that our product candidates have the necessary safety, purity, and potency for any of their proposed indications;
- the results of clinical trials may not meet the level of statistical significance required by the FDA or comparable foreign regulatory authorities for approval;
- we may be unable to demonstrate that our product candidates' clinical and other benefits outweigh their safety risks;
- we may encounter serious and unexpected adverse events during clinical trials that render our products unsafe for use in humans;
- the FDA or comparable foreign regulatory authorities may disagree with our interpretation of data from preclinical studies or clinical trials;
- the data collected from clinical trials of our product candidates may not be sufficient to the satisfaction of the FDA or comparable foreign regulatory authorities to support the submission of a BLA or other comparable submission in foreign jurisdictions or to obtain regulatory approval in Europe, the U.S. or elsewhere;
- the FDA or comparable foreign regulatory authorities may fail to approve our manufacturing processes and/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 regulatory authorities may significantly change in a manner rendering our clinical data insufficient for approval.

Biopharmaceutical product development is a highly speculative undertaking and involves a substantial degree of uncertainty. We have never generated any revenue from product sales and may never be profitable.

We have devoted substantially all of our financial resources and efforts to developing our proprietary CID technology platform, identifying potential product candidates and conducting preclinical studies and clinical trials. We are in the early stages of developing our product candidates, and we have not completed development of any products. Our ability to generate revenue and achieve profitability depends in large part on our ability, alone or with partners, to successfully complete the development of, obtain the necessary regulatory approvals for, and commercialize, product candidates. We do not anticipate generating revenues from sales of products for the foreseeable future. Our ability to generate future revenues from product sales depends heavily on our success in:

- completing requisite clinical trials through all phases of clinical development of our current product candidates;
- seeking and obtaining marketing approvals for product candidates that successfully complete clinical trials, if any;
- launching and commercializing product candidates for which we obtain marketing approval, if any, with a partner or, if launched independently, successfully establishing a sales force, marketing and distribution infrastructure;
- identifying and developing new product candidates;
- progressing our pre-clinical programs into human clinical trials;
- establishing and maintaining supply and manufacturing relationships with third parties;

- developing new molecular switches based on our proprietary CID technology platform;
- maintaining, protecting, expanding and enforcing our intellectual property; and
- attracting, hiring and retaining qualified personnel.

Because of the numerous risks and uncertainties associated with biologic product development, we are unable to predict the likelihood or timing for when we may receive regulatory approval of any of our current or future product candidates or when we will be able to achieve or maintain profitability, if ever. If we do not receive regulatory approvals, our business, prospects, financial condition and results of operations will be adversely affected. Even if we obtain the regulatory approvals to market and sell one or more of our product candidates, we may never generate significant revenues from any commercial sales for several reasons, including because the market for our products may be smaller than we anticipate, or products may not be adopted by physicians and payors or because our products may not be as efficacious or safe as other treatment options. If we fail to successfully commercialize one or more products, we may be unable to generate sufficient revenues to sustain and grow our business and our business, prospects, financial condition and results of operations will be adversely affected. In addition, our expenses could increase beyond expectations if we are required by the FDA, or foreign regulatory agencies, to perform studies and clinical trials in addition to those that we currently anticipate for our product candidates, or if there are any delays in our or our partners completing clinical trials or the development of any of our product candidates. Further, if one or more of the product candidates that we independently develop is approved for commercial sale, we expect to incur significant costs associated with commercializing any such product candidates. Finally, even if we do achieve profitability, we may not be able to sustain or increase profitability on a quarterly or annual basis.

Our CID technology is novel and largely unproven.

Our proprietary CID technology platform is novel and there are no approved products or third-party product candidates in late-stage clinical trials based on this technology. Additionally, the safety and efficacy profile of rimiducid has not been subject to large scale clinical testing. If rimiducid is found to have a poor safety profile in clinical trials, or if our technology is not effective, we may be required to redesign all of our product candidates, which would require significant time and expense. In addition, our CID platform technology may not be applicable or effective in the development of additional cellular immunotherapies beyond our current programs which would adversely affect our business and prospects.

Cell therapies are novel and present significant challenges.

CAR-T and other cell therapy product candidates represent a relatively new field of cellular immunotherapy. Advancing this novel and personalized therapy creates significant challenges for us, including:

- obtaining regulatory approval, as the FDA and other regulatory authorities have limited experience with commercial development of cell therapies for cancer;
- sourcing clinical and, if approved, commercial supplies for the materials used to manufacture and process our product candidates;
- developing a consistent and reliable process, while limiting contamination risks, for engineering and manufacturing T cells and other immune cell types ex vivo and infusing the engineered cells into the patient;
- educating medical personnel regarding the potential safety benefits, as well as the challenges, of incorporating our product candidates into their treatment regimens;
- establishing sales and marketing capabilities upon obtaining any regulatory approval to gain market acceptance of a novel therapy; and
- the availability of coverage and adequate reimbursement from third-party payors for our novel and personalized therapy.

Our inability to successfully develop CAR-T and other cell therapies or develop processes related to the manufacture or commercialization of these therapies would adversely affect our business, results of operations and prospects.

Our clinical trials may fail to adequately demonstrate the safety and efficacy of any of our product candidates, which would prevent or delay regulatory approval and commercialization.

Clinical testing is expensive, takes many years to complete, and its outcome is inherently uncertain. Failure can occur at any time during the clinical trial process and our product candidates are subject to the risks of failure inherent in biologic drug development. Success in early clinical trials does not mean that later clinical trials will be successful because product candidates in later-stage clinical trials may fail to demonstrate sufficient safety or efficacy despite having progressed through initial clinical testing, even at statistically significant levels. We will be required to demonstrate through clinical trials that our product candidates are safe and effective for use in the target indication before we can obtain regulatory approvals for commercial sale. Companies frequently suffer significant setbacks in late-stage clinical trials, even after earlier clinical trials have shown promising results and most product candidates that commence clinical trials are never approved as products. We expect there may be greater variability in

results for cellular immunotherapy products processed and administered on a patient-by-patient basis like some of our CID technology-based development and product candidates than for "off-the-shelf" products, like many drugs.

If any of our product candidates fail to demonstrate sufficient safety or efficacy, we would experience potentially significant delays in, or be required to abandon our development of the product candidate, which would have a material and adverse impact on our business, prospects, financial condition and results of operations.

Many of our current product candidates are in early stage clinical trials, and we may experience unfavorable results in the future.

A Phase 1/2 clinical trial is ongoing for BPX-601 for the treatment of prostate and pancreatic cancer, and a Phase 1/2 clinical trial for BPX-603 in HER2-positive solid tumors. We may not be able to commence clinical trials in the time frames we expect or we may encounter delays. For example, in December 2020, we announced that the FDA had placed a clinical hold on our BPX-601 trial in pancreatic cancer due to the death of a patient in the trial. Although the FDA released the hold in January 2021, there can be no assurance that future patients deaths in this or any of our clinical trials will not trigger additional clinical holds. As these product candidates are in early stages of development, we face significant uncertainty regarding how effective and safe they will be in human patients and the results from preclinical studies, such as *in vitro* and *in vivo* studies, of BPX-601 and BPX-603 may not be indicative of the results of clinical trials of these product candidates. For example, in October 2020, we announced that the first four pancreatic cancer patients treated with BPX-601 followed by repeat rimiducid dosing showed evidence of rimiducid-mediated CAR-T cell activation but clinically meaningful efficacy as measured by RECIST criteria was not observed. Preclinical and clinical data are often susceptible to varying interpretations and analyses, and many companies that have believed their product candidates performed satisfactorily in preclinical studies and clinical trials have nonetheless failed to obtain marketing approval for their products.

Even if clinical trials are successfully completed, the FDA or foreign regulatory authorities may not interpret the results as we do, and more clinical trials could be required before we submit our product candidates for approval. To the extent that the results of our clinical trials are not satisfactory to the FDA or foreign regulatory authorities for support of a marketing application, approval of our product candidates may be significantly delayed, or we may be required to expend significant additional resources, which may not be available to us, to conduct additional clinical trials in support of potential approval of our product candidates.

We may not be successful in our efforts to use and expand our CID platform to build a pipeline of product candidates and develop marketable products.

We believe that our CID platform, which serves as the foundation of our CaspaCIDe and GoCAR-T technologies, can be further leveraged to discover other novel technologies, therapeutic applications and market opportunities. We are at an early stage of development and our platform has not yet, and may never lead to, approved or marketable products. Even if we are successful in continuing to build our pipeline, the potential product candidates that we identify may not be suitable for clinical development, including for reasons related to their harmful side effects, limited efficacy or other characteristics that indicate that they are unlikely to be products that will receive marketing approval and achieve market acceptance. If we do not successfully develop and commercialize product candidates based upon our technological approach, we may not be able to obtain product or partnership revenues in future periods, which would adversely affect our business, prospects, financial condition and results of operations.

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

We depend and will continue to depend upon independent investigators and collaborators, such as universities, medical institutions, and strategic partners to conduct our preclinical and clinical trials under agreements with us. Negotiations of budgets and contracts with study sites may result in delays to our development timelines and increased costs. We will rely heavily on these third parties over the course of our clinical trials, and we control only certain aspects of their activities. Nevertheless, we are responsible for ensuring that each of our studies is conducted in accordance with applicable protocol, legal, regulatory and scientific standards, and our reliance on third parties does not relieve us of our regulatory responsibilities. We and these third parties are required to comply with good clinical practices, or GCPs, which are regulations and guidelines enforced by the FDA and comparable foreign regulatory authorities for product candidates in clinical development. Regulatory authorities enforce these GCPs through periodic inspections of clinical trial sponsors, principal investigators and clinical trial sites. If we or any of these third parties fail to comply with applicable GCP regulations, the clinical data generated in our clinical trials may be deemed unreliable and the FDA or comparable foreign regulatory authorities could require us to perform additional clinical trials before approving our marketing applications. It is possible that, upon inspection, such regulatory authorities could determine that any of our clinical trials fail to comply with the GCP regulations. In addition, our clinical trials must be conducted with biologic product produced under current good manufacturing practices, or cGMPs, and will require a large number of test patients. Our failure or any failure by these third parties to comply with these regulations or to recruit a sufficient number of patients may require us to repeat clinical trials, which

would delay the regulatory approval process. Moreover, our business may be implicated if any of these third parties violates federal or state fraud and abuse or false claims laws and regulations or healthcare privacy and security laws.

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

Switching or adding third parties to conduct our clinical trials involves substantial cost and requires extensive management time and focus. In addition, there is a natural transition period when a new third party commences work. As a result, delays occur, which can materially impact our ability to meet our desired clinical development timelines.

Also, we are conducting clinical trials in Europe and may plan additional testing of our technology and product candidates in other foreign jurisdictions. We currently have limited staffing and capabilities in foreign countries and may not be able to effectively resolve potential disputes with our independent investigators and collaborators.

Our business could be adversely affected by the effects of health epidemics, including the recent COVID-19 outbreak, as well as the business or operations of our research partners, customers and other third parties with whom we conduct business.

Our business could be adversely affected by health epidemics in regions in which we have operations or conduct research activities or clinical trials. Such health epidemics could also affect the business or operations of contract manufacturers, raw material suppliers, clinical trial sites, and other third parties with whom we conduct business.

For example, in response to public health directives and orders related to the COVID-19 pandemic, we have implemented work-from-home policies for certain employees and temporarily modified our research operations to comply with applicable social distancing recommendations. The effects of government stay-at-home orders and our related adjustments in our business is likely to negatively impact productivity, disrupt our business and delay our timelines, the magnitude of which will depend, in part, on the length and severity of the restrictions and other limitations on our ability to conduct our business in the ordinary course.

Severe and/or long-term disruptions in our operations will negatively impact our business, operating results and financial condition. Specifically, we anticipate that the stress of COVID-19 on healthcare systems around the globe may harm our ability to conduct clinical trials in the near term due primarily to the lack of resources at clinical trial sites and the resulting inability to enroll patients in the trials. If patients drop out of our trials, miss scheduled doses or follow-up visits, be unable to undergo specific study procedures such as biopsies, or otherwise fail to follow trial protocols, or if our trials are otherwise disrupted due to COVID-19 or actions taken to slow its spread, the integrity of data from our trials may be compromised or not accepted by the FDA or other regulatory authorities, which would represent a significant setback for the applicable program. To date, we have experienced COVID-19-related impacts on screening and enrollment which may impact the speed of enrollment and the timing of data presentations from our ongoing studies. More significant disruptions may occur if the pandemic worsens in the geographies in which our study sites or manufacturing facilities are located. In addition, quarantines, stay-at-home, executive and similar government orders, or the perception that such orders, shutdowns or other restrictions on the conduct of business operations could occur, impact personnel at third-party manufacturing facilities in the United States and other countries, or the availability or cost of materials, which would disrupt our supply chain. In fact, in April 2020 M.D. Anderson informed the Company of its decision to temporarily halt all research activity in order to reduce the spread and impact of COVID-19 on their institution and their patients and this includes temporarily suspending activity in the manufacturing facility in which the product candidates for our clinical development programs are manufactured. M.D. Anderson subsequently restarted manufacturing but if the pandemic worsens and they again suspend research activities, we may be unable to enroll patients in our ongoing and planned clinical trials until manufacturing resumes at the facility.

The spread of COVID-19, which has caused a broad impact globally, may materially affect us economically. While the potential economic impact brought by, and the duration of, COVID-19 may be difficult to assess or predict, it has significantly disrupted global financial markets, and may limit our ability to access capital, which could in the future negatively affect our liquidity. A recession or market correction resulting from the spread of COVID-19 could materially affect our business and the value of our common stock.

The ultimate impact of the COVID-19 outbreak or a similar health epidemic is highly uncertain and subject to change. We do not yet know the full extent of potential delays or impacts on our business, our clinical trials, healthcare systems or the global economy as a whole. However, the effects could have a material impact on our operations, and we will continue to monitor the COVID-19 situation closely. In addition, to the extent the ongoing COVID-19 outbreak adversely affects our business, financial condition, results of operations and growth prospects, it may also have the effect of heightening many of the other risks and uncertainties described elsewhere in this "Risk Factors" section.

If we encounter difficulties enrolling patients in our clinical trials, our clinical development activities could be delayed or otherwise adversely affected.

We may experience difficulties in patient enrollment in our clinical trials for a variety of reasons. The timely completion of clinical trials in accordance with their protocols depends, among other things, on our ability to enroll a sufficient number of patients who remain in the study until its conclusion. The enrollment of patients depends on many factors, including:

- the patient eligibility criteria defined in the protocol;
- the size of the patient population required for analysis of the trial's primary endpoints;
- the proximity of patients to study sites;
- the design of the clinical trial;
- our ability to recruit clinical trial investigators with the appropriate competencies and experience;
- our ability to obtain and maintain patient consents;
- the impact of the COVID-19 pandemic;
- the risk that patients enrolled in clinical trials will drop out of the clinical trials before completion; and
- competing clinical trials and approved therapies available for patients.

In particular, some of our clinical trials will look to enroll patients with characteristics which are found in a very small population, for example, patients with rare cancers with specific attributes that are targeted with our product candidates. Our clinical trials will compete with other companies' clinical trials for product candidates that are in the same therapeutic areas as our product candidates, and this competition will reduce the number and types of patients available to us, because some patients who might have opted to enroll in our clinical trials may instead opt to enroll in a trial being conducted by one of our competitors. Since the number of qualified clinical investigators 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 in these clinical trial sites. Moreover, because our product candidates represent a departure from more commonly used methods for cancer treatment, potential patients and their doctors may be inclined to use conventional therapies, such as chemotherapy and antibody therapy, rather than enroll patients in any of our future clinical trials. Patients may also be unwilling to participate in our clinical trials because of negative publicity from adverse events in the biotechnology or gene therapy industries.

Delays in patient enrollment may result in increased costs or may affect the timing or outcome of the planned clinical trials, which could prevent completion of these clinical trials and adversely affect our ability to advance the development of our product candidates.

Any adverse developments that occur during any clinical trials conducted by academic investigators, our collaborators or other entities conducting clinical trials under independent INDs may affect our ability to obtain regulatory approval or commercialize our product candidates.

Rimiducid and CaspaCIDe-containing cell therapy constructs are being used by third parties in clinical trials for which we are collaborating or in clinical trials which are completely independent of our development programs. We have little to no control over the conduct of those clinical trials. If serious adverse events occur during these or any other clinical trials using our product candidates, the FDA and other regulatory authorities may delay, limit or deny approval of our product candidate or require us to conduct additional clinical trials as a condition to marketing approval, which would increase our costs. If we receive regulatory approval for any product candidate and a new and serious safety issue is identified in clinical trials conducted by third parties, the applicable regulatory authorities may withdraw their approval of the product or otherwise restrict our ability to market and sell our product. In addition, treating physicians may be less willing to administer our product due to concerns over such adverse events, which would limit our ability to commercialize our product.

Adverse side effects or other safety risks associated with our product candidates could delay or preclude approval, cause us to suspend or discontinue clinical trials, abandon product candidates, limit the commercial profile of an approved label, or result in significant negative consequences following marketing approval, if any.

Adoptive cell therapy with autologous T cells is associated with a range of potentially severe immune-mediated adverse effects. In third party clinical trials involving CAR-T cells, the most prominent acute toxicities included symptoms thought to be associated with the release of cytokines, such as fever, low blood pressure and kidney dysfunction. Some patients also experienced toxicity of the central nervous system, such as confusion, cranial nerve dysfunction and speech impairment. Adverse side effects attributed to CAR-T cells were severe and life-threatening in some patients. The life-threatening events were related to kidney dysfunction and toxicities of the central nervous system. Severe and life-threatening toxicities occurred primarily in the first two weeks after cell infusion and generally resolved within three weeks. In the past, several patients have also died in clinical trials by others involving CAR-T cells.

Undesirable side effects observed in our clinical trials, whether or not they are caused by our product candidates, could result in the delay, suspension or termination of clinical trials by us, the FDA or other regulatory authorities for a number of reasons. In addition, because the patients in our clinical trials are suffering from life-threatening diseases, are often suffering from multiple complicating conditions and, in the case of transplant patients, are in a position of extreme immune deficiency at the time that they receive our therapy, it may be difficult to accurately assess the relationship between our product candidates and adverse events experienced by very ill patients. If we elect or are required to delay, suspend or terminate any clinical trial of any product candidates that we develop, the commercial prospects of such product candidates will be harmed and our ability to generate product revenues from any of these product candidates will be delayed or eliminated. Serious adverse events observed in clinical trials could hinder or prevent market acceptance of the product candidate at issue. Any of these occurrences may harm our business, prospects, financial condition and results of operations significantly.

Clinical trials are expensive, time-consuming and difficult to design and implement.

Human clinical trials are expensive and difficult to design and implement, in part because they are subject to rigorous regulatory requirements. Because our product candidates are based on relatively new technology, we expect that they will require extensive research and development and have substantial manufacturing and processing costs. Costs to treat patients with relapsed/refractory cancer and to treat potential side effects that may result from therapies such as our current and future product candidates can be significant. Accordingly, our clinical trial costs are likely to be significantly higher than for more conventional therapeutic technologies or drug products. In addition, our proposed product candidates involve several complex and costly manufacturing and processing steps, the costs of which will be borne by us. The costs of our clinical trials may increase if the FDA does not agree with our clinical development plans or requires us to conduct additional clinical trials to demonstrate the safety and efficacy of our product candidates.

We face significant competition from other biotechnology and pharmaceutical companies, and our operating results will suffer if we fail to compete effectively.

The biopharmaceutical industry is characterized by intense competition and rapid innovation. Our competitors may be able to develop other compounds or drugs that are able to achieve similar or better results. Our potential competitors include major multinational pharmaceutical companies, established biotechnology companies, specialty pharmaceutical companies and universities and other research institutions. Many of our competitors have substantially greater financial, technical and other resources, such as larger research and development staff and experienced marketing and manufacturing organizations and well-established sales forces. Smaller or early-stage companies may also prove to be significant competitors, particularly through collaborative arrangements with large, established companies. Mergers and acquisitions in the biotechnology and pharmaceutical industries may result in even more resources being concentrated in our competitors. Competition may increase further as a result of advances in the commercial applicability of technologies and greater availability of capital for investment in these industries. Our competitors, either alone or with collaborative partners, may succeed in developing, acquiring or licensing on an exclusive basis drug or biologic products that are more effective, safer, more easily commercialized or less costly than our product candidates or may develop proprietary technologies or secure patent protection that we may need for the development of our technologies and products. We believe the key competitive factors that will affect the development and commercial success of our product candidates are efficacy, safety, tolerability, reliability, convenience of use, price and reimbursement.

Specifically, genetically engineering T cells is a competitive endeavor. Multiple companies are engaged in the engineering of T cells, including (but not limited to), Adaptimmune, Allogene Therapeutics, Inc., Amgen Inc., Atara Biotherapeutics, Inc., Autolus Therapeutics plc, bluebird bio, Inc., Bristol-Meyer Squibb Co., Cellectis SA, Celyad S.A., Fate Therapeutics Inc., GlaxoSmithKline plc, Gilead Sciences, Inc., Iovance Biotherapeutics, Inc., Janssen Pharmaceutical, Kuur Therapeutics, Legend Biotech, Lyell Immunopharma, Inc., Medigene AG, MolMed S.p.A., Mustang Bio, Inc., Novartis AG, Obsidian Therapeutics, Poseida Therapeutics, Precision Biosciences, Inc., Sorrento Therapeutics, Inc., Takeda Pharmaceutical Co, and Ziopharm Oncology.

Even if we obtain regulatory approval of our product candidates, the availability and price of our competitors' products could limit the demand and the price we are able to charge for our product candidates. We may not be able to implement our business plan if the acceptance of our product candidates is inhibited by price competition or the reluctance of physicians to switch from existing methods of treatment to our product candidates, or if physicians switch to other new drug or biologic products or choose to reserve our product candidates for use in limited circumstances. For additional information regarding our competition, see "Item 1. Business Competition" under Part I of our Annual Report.

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. Workforce and expense reductions may have an adverse impact on our internal programs, our ability to hire and retain key personnel and may be distracting to management.

Our ability to compete in the highly competitive biotechnology and pharmaceutical industries depends upon our ability to attract and retain highly qualified managerial, scientific and medical personnel. We are highly dependent on our management, scientific and medical personnel. 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.

Pursuant to our restructuring plan announced in October 2020, we have reduced our staff to 10 employees as of March 19, 2021. This reduction in our staff included our Chief Financial Officer, our Chief Legal and Strategy Officer and various scientific personnel. Depending on our need for additional funding and expense control, we may be required to implement further workforce and expense reductions in the future. Further workforce and expense reductions may not result in efficiencies and anticipated savings and could result in reduced progress on our internal programs. In addition, employees, whether or not directly affected by a reduction, may seek future employment with our business partners or competitors. Although our employees are required to sign a confidentiality agreement at the time of hire, the confidentiality of certain proprietary information and knowledge may not be maintained in the course of any such future employment. Further, we believe that our future success will depend in large part upon our ability to attract and retain highly skilled personnel. We may have difficulty retaining and attracting such personnel as a result of a perceived risk of future workforce and expense reductions. In addition, the implementation of expense reduction programs may result in the diversion of efforts of our executive management team and other key employees, which could adversely affect our business.

To induce valuable employees to remain at our company, in addition to salary and cash incentives, we have provided stock options and restricted stock units, or RSUs, that vest over time. The value to employees of stock options and RSUs that vest over time may be significantly affected by movements in our stock price that are beyond our control and may at any time be insufficient to counteract more lucrative offers from other companies. Despite our efforts to retain valuable employees, members of our management, 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 scientific and medical personnel.

The terms of our 2019 private placement of equity restrict our operating and financial flexibility, and give priority to certain investors, both of which could significantly harm our liquidity, financial condition, operating results, business and prospects and cause the price of our common stock to decline.

In August 2019, we completed an underwritten public offering of 575,000 shares of Series 1 preferred stock and warrants to purchase up to 5,750,000 shares of common stock. Concurrent with the public offering we entered into an agreement with certain institutional investors providing for a private placement, pursuant to which we agreed to sell at two or more separate closings, each at the option of the investors and subject to certain conditions, shares of Series 2 preferred stock and warrants to purchase common stock, and shares of Series 3 preferred stock and warrants to purchase common stock, for aggregate gross proceeds of up to $70.0 million. Pursuant to the terms of the securities purchase agreement for the private placement transaction, the investors in the private placement transaction have consent rights over certain significant matters of our business. These include decisions to authorize or issue equity securities that are senior or pari passu to the Series 3 preferred stock with respect to liquidation preference, the occurrence of indebtedness in excess of $1,000,000, the sale or license of certain of our technology and the payment of dividends. As a result, these stockholders, acting together, will have significant influence over certain matters affecting our business. The investors in the private placement may not exercise their rights to purchase additional tranches of preferred stock and may not consent to us seeking additional funds through debt or other equity financings. In addition, potential investors in the Company may decline to do so because of the preferential rights granted under the private placement agreement. Each of these factors could negatively impact our liquidity, financial condition, operating results, business and prospects and cause the price of our common stock to decline.

We are reliant on a third party to manufacture our clinical product candidates and may not be able to secure adequate manufacturing capacity.

In April 2020, we announced the closing of the sale of our U.S. manufacturing facility to M.D. Anderson. When M.D. Anderson assumed ownership of the facility, we became reliant on M.D. Anderson to supply our current clinical product candidates. We have endeavored to structure the transaction in a manner that ensures availability of adequate capacity and priority access thereto for the continued clinical development of our product candidates. Given the complexity of the manufacturing processes for cellular therapies, M.D. Anderson may be unable to effectively manufacture or release our products in accordance with applicable cGMP standards, which could result in significant costs or delays to our programs.

We oversee a complex manufacturing supply chain of cellular therapy product candidates, viral vectors and small molecule drugs.

Because of the complex nature of our cell therapy products, we need to oversee the manufacture of multiple components that require a diverse knowledge base and appropriate manufacturing personnel. The supply chain for these components is separate and distinct, and no single manufacturer can supply more than one component of each of our products. Additionally, it is likely that the cell therapy products will need to be made within an appropriate geographic location for the area in which the products will be utilized, so one cell therapy manufacturing facility may not be able to supply diverse geographic areas. Any lack of capabilities to store, freeze, thaw and infuse our cell therapies would adversely affect our business and prospects.

Our autologous GoCAR-T product candidates, including BPX-601 and BPX-603 are manufactured on a patient-by-patient basis using each patient's own cells. Efficient manufacturing of these products relies upon our ability to sufficiently expand and activate the cells of patients who have undergone multiple lines of prior therapy, often including immunosuppressive chemotherapy. Rimiducid, the small molecule drug used to activate both our iMC and iC9 switches, is a complex molecule to synthesize and is relatively insoluble and lipophilic, rendering it difficult to formulate. We have limited internal expertise in small molecule drug development and manufacturing, and we have identified specialty contract manufacturers to produce the rimiducid drug substance and drug product. It is uncertain whether the drug substance and drug product manufacturers will be able to manufacture sufficient quantity and quality of rimiducid to conduct the necessary non-clinical and clinical trials.

We have not yet caused our product candidates to be manufactured or processed on a commercial scale. We may not be able to scale patient-by-patient manufacturing and processing to satisfy clinical or commercial demands for any of our product candidates. In addition, our anticipated reliance on a limited number of third-party manufacturers for manufacturing exposes us to the following risks:

- We may be unable to identify manufacturers on acceptable terms or at all because the number of potential manufacturers is limited, and any replacement contractor must be approved by regulatory authorities. This approval would require new testing and compliance inspections. In addition, a new manufacturer would have to be educated in, or develop substantially equivalent processes for, production of our products after receipt of regulatory approval, if any.
- Our third-party manufacturers might 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.
- Our future contract manufacturers may not perform as agreed or may not remain in the contract manufacturing business for the time required to supply our clinical trials or to successfully produce, store and distribute our products.
- Manufacturers are subject to ongoing periodic unannounced inspection by regulatory agencies to ensure strict compliance with cGMP and other government regulations and standards. We do not have control over third-party manufacturers' compliance with these regulations and standards.
- We may not own, or may have to share, the intellectual property rights to any improvements made by our third-party manufacturers in the manufacturing process for our products.
- Our third-party manufacturers could breach or terminate their agreement with us.

Each of these risks could delay our clinical trials, the approval, if any of our product candidates or the commercialization of our product candidates or result in higher costs or deprive us of potential product revenue. In addition, we will rely on third parties to perform release tests on our product candidates prior to delivery to patients. If these tests are not appropriately done and test data are not reliable, patients could be put at risk of serious harm.

We have limited information available regarding the ultimate cost of our products, and cannot estimate what the cost of our products will be upon commercialization, should that occur.

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.

Because of the patient-specific nature of our manufacturing process, it is not amenable to traditional “scale up” to manufacture larger lots as is performed for traditional drugs and biological agents.

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

Gene-modified cell therapy manufacture requires many specialty raw materials, some of which are manufactured by small companies with limited resources and experience to support a commercial product. Some suppliers typically support biomedical researchers or blood-based hospital businesses and may not have the capacity to support commercial products manufactured under cGMP by biopharmaceutical firms. The suppliers may be ill-equipped to support our needs, especially in non-routine circumstances like an FDA inspection or medical crisis, such as widespread contamination. We also do not have commercial supply arrangements with many of these suppliers and may not be able to contract with them 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.

A variety of risks associated with marketing our product candidates internationally could materially adversely affect our business.

We plan to seek regulatory approval of our product candidates outside of the U.S. and, accordingly, we will be subject to additional risks related to operating in foreign countries if we obtain the necessary approvals, including:

- differing regulatory requirements in foreign countries;
- unexpected changes in tariffs, trade barriers, price and exchange controls and other regulatory requirements;
- economic weakness, including inflation, or political instability in particular foreign economies and markets;
- compliance with tax, employment, immigration and labor laws for employees living or traveling abroad;
- foreign taxes, including withholding of payroll taxes;
- foreign currency fluctuations, which could result in increased operating expenses and reduced revenue, and other obligations incident to doing business in another country;
- difficulties staffing and managing foreign operations;
- workforce uncertainty in countries where labor unrest is more common than in the U.S.;
- potential liability under the FCPA or comparable foreign regulations;
- challenges enforcing our contractual and intellectual property rights, especially in those foreign countries that do not respect and protect intellectual property rights to the same extent as the U.S.;
- production shortages resulting from any events affecting raw material supply or manufacturing capabilities abroad;
- differing payor reimbursement regimes, governmental payors or patient self-pay systems and price controls; and
- business interruptions resulting from geo-political actions, including war and terrorism, and the impact of the COVID-19 pandemic;.

These and other risks associated with our international operations may materially adversely affect our ability to attain or maintain profitable operations.

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

We may form or seek strategic alliances, create joint ventures or collaborations and 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 and any future product candidates that we may develop. Any of these relationships may require us to incur non-recurring and other charges, increase our near and long-term expenditures, issue securities that dilute our existing stockholders or disrupt our management and business. In addition, we face significant competition in seeking appropriate strategic partners and the negotiation process is time-consuming and complex. Moreover, we may not be successful in our efforts to establish a strategic partnership or other alternative arrangements for our product candidates because they may be deemed to be at too early of a stage of development for collaborative effort and third parties may not view our product candidates as having the requisite potential to demonstrate safety and efficacy. If we license products or businesses, we may not be able to realize the benefit of such transactions if we are unable to successfully integrate them with our existing operations and company culture. It is possible that, following a

strategic transaction or license, we may not achieve the revenue or specific net income that justifies such transaction. Any delays in entering into new 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.

If we are unable to identify a strategic partner for rivo-cel, we may not realize value from this asset and we will continue to incur substantial costs.

We are actively pursuing a strategic partner for our CaspaCIDe-containing polyclonal T cell product candidate called rivogenleceucel, or rivo-cel. A partner would assume current and future development and commercialization responsibilities for this product candidate on a worldwide basis. Concurrently, we have substantially reduced and will continue to reduce our rivo-cel-related activities and spending. For example, we have closed our UK office, which was established to prepare for commercialization in Europe. If we are unable to identify an appropriate strategic partner or to negotiate and consummate a license agreement with such a partner, it will be impossible to submit the planned Marketing Authorisation Applications, or MAA required to seek approval to commercialize this product candidate in Europe. Such a delay in the process of preparing and submitting the MAA will make it more difficult for us or any possible strategic partner to restart the process in the future and ultimately obtain approval for the product, increasing the likelihood that we may be unable to derive any meaningful revenue from this asset. In addition, we are obligated to continue certain regulatory and clinical activities following conclusion of the rivo-cel clinical trials and if we are unable to identify a strategic partner, we will continue to incur the costs for the internal and external resources required to complete those activities.

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

Because we rely on third parties to manufacture our drug substance and product, and because we collaborate with various organizations and academic institutions on the advancement of our technology platform, we must, at times, share trade secrets with them. We seek to protect our proprietary technology in part by entering into confidentiality agreements and, if applicable, material transfer agreements, collaborative research agreements, consulting agreements or other similar agreements with our collaborators, advisors, employees and consultants prior to beginning research or disclosing proprietary information. These agreements typically limit the rights of the third parties to use or disclose our confidential information, such as trade secrets. Despite these contractual provisions, the need to share trade secrets and other confidential information increases the risk that such trade secrets become known by our competitors, are inadvertently incorporated into the technology of others, or are disclosed or used in violation of these agreements. Given that our proprietary position is based, in part, on our know-how and trade secrets, a competitor’s discovery of our trade secrets or other unauthorized use or disclosure would impair our competitive position and may have a material adverse effect on our business.

We may use our financial and human resources to pursue a particular research program or product candidate and fail to capitalize on programs or product candidates that may be more profitable or for which there is a greater likelihood of success.

Because we have limited resources, we may forego or delay pursuit of opportunities with certain programs or product candidates or for indications that later prove to have greater commercial potential. Our resource allocation decisions may cause us to fail to capitalize on viable commercial products or profitable market opportunities. Our spending on current and future research and development programs for product candidates may not yield any commercially viable products. If we do not accurately evaluate the commercial potential or target market for a particular product candidate, we may relinquish valuable rights to that product candidate through strategic collaboration, licensing or other royalty arrangements in cases in which it would have been more advantageous for us to retain sole development and commercialization rights to such product candidate, or we may allocate internal resources to a product candidate in a therapeutic area in which it would have been more advantageous to enter into a partnering arrangement.

We and our contractors utilize hazardous materials in our business operations, and any claims relating to improper handling, storage, or disposal of these materials could harm our business.

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

Our internal computer systems, or those used by our clinical investigators, contractors or consultants, may fail or suffer security breaches.

Despite the implementation of security measures, our internal computer systems and those of our contractors and consultants are vulnerable to damage from computer viruses and unauthorized access. While we have not experienced any such material system failure or security breach to date, if such an event were to occur and cause interruptions in our operations, it could result in a material disruption of our development programs and our business operations. For example, the loss of clinical trial data from completed or future clinical trials could result in delays in our regulatory approval efforts and significantly increase our costs to recover or reproduce the data. To the extent that any disruption or security breach were to result in a loss of, or damage to, our data or applications, or inappropriate disclosure of confidential or proprietary information, we could incur liability and the further development and commercialization of our product candidates could be delayed.

System outages, network disruptions and cyber-security threats could interrupt the operation of our business.

We are dependent on the use of information technology systems for our operations. Outages, disruptions and threats could have an adverse impact on our ability to conduct operations. Cyber-security threats, such as malware, phishing and network attacks, are on the rise. These attacks can affect the availability of our information technology systems, including their data, as well as the confidentiality and integrity of these systems. A security breach poses a risk to confidential data, including but not limited to intellectual property and trade secrets resulting in financial, legal or reputational harm to us. Insider threats may exist if an individual authorized to access our technology systems improperly discloses sensitive data to unauthorized persons or the public. We also have outsourced elements of our operations, including elements of our information technology infrastructure, and thus manage several independent vendor relationships with third parties who may have access to our confidential information. Confidentiality agreements are in place for authorized users and third parties to support the prevention of confidential information being improperly disclosed. We have policies and procedures in place, including controls around the access and activity of authorized users, active system monitoring, back-up and recovery, information technology security and mandatory annual information technology security awareness training to assist in the prevention and mitigation of an outage, disruption or threat. In addition, we have invested in high availability, redundant technologies that will reduce the risk of an outage, disruption or threat. However, our efforts may not prevent an outage, disruption or threat that would materially adversely affect us. We also may not have sufficient liability insurance, either type or amount, to cover us against claims related to a cyber-security threat.

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

Our operations, and those of our clinical investigators, contractors and consultants, could be subject to power shortages, telecommunications failures, water shortages, floods, earthquakes, hurricanes, typhoons, fires, extreme weather conditions, medical epidemics and other natural or man-made disasters or business interruptions, for which we are predominantly self-insured. The occurrence of any of these business disruptions could seriously harm our operations and financial condition and increase our costs and expenses. We rely on third-party manufacturers to produce and process our product candidates on a patient by patient basis. Our ability to obtain clinical supplies of our product candidates could be disrupted if the operations of these suppliers are affected by a man-made or natural disaster or other business interruption. In particular, certain third-party manufacturers may be unable to comply with their contractual obligations to us due to disruptions caused by COVID-19, including reduced operations or headcount reductions, or otherwise, and in certain cases we may have limited recourse if the non-compliance is due to factors outside of the manufacturer’s control.

Our employees, independent contractors, consultants, commercial partners and vendors may engage in misconduct or other improper activities, including noncompliance with regulatory standards and requirements.

We are exposed to the risk of employee fraud or other illegal activity by our employees, independent contractors, consultants, commercial partners and vendors. Misconduct by these parties could include intentional, reckless and/or negligent conduct that fails to: comply with the laws of the FDA and other similar foreign regulatory bodies; provide true, complete and accurate information to the FDA and other similar foreign regulatory bodies, comply with manufacturing standards we have established, comply with healthcare fraud and abuse laws in the U.S. and similar foreign fraudulent misconduct laws, or report financial information or data accurately or to disclose unauthorized activities to us. If we obtain FDA approval of any of our product candidates and begin commercializing those products in the U.S., our potential exposure under such laws will increase significantly, and our costs associated with compliance with such laws are also likely to increase. These laws may impact, among other things, our current activities with principal investigators and research patients, as well as proposed and future sales, marketing and education programs. In particular, the promotion, sales and marketing of healthcare items and services, as well as certain business arrangements in the healthcare industry, are subject to extensive laws designed to prevent fraud, kickbacks, self-dealing and other abusive practices. These laws and regulations may restrict or prohibit a wide range of pricing, discounting, marketing and promotion, structuring and commission(s), certain customer incentive programs and other business arrangements

generally. Activities subject to these laws also involve the improper use of information obtained in the course of patient recruitment for clinical trials. The laws that may affect our ability to operate include, but are not limited to:

- the federal Anti-Kickback Statute, which prohibits, among other things, knowingly and willfully soliciting, receiving, offering or paying any remuneration (including any kickback, bribe, or rebate), directly or indirectly, overtly or covertly, in cash or in kind, to induce, or in return for, either the referral of an individual for, or the purchase, lease, order or recommendation of any good, facility, item or service for which payment may be made, in whole or in part, under a federal healthcare program, such as the Medicare and Medicaid programs;
- federal civil and criminal false claims laws and civil monetary penalties law, which prohibit, among other things, individuals or entities from knowingly presenting, or causing to be presented, claims for payment or approval from Medicare, Medicaid, or other third-party payors that are false or fraudulent or knowingly making a false statement to improperly avoid, decrease or conceal an obligation to pay money to the federal government;
- the federal Health Insurance Portability and Accountability Act of 1996, or HIPAA, which created new federal criminal statutes that prohibit knowingly and willfully executing, or attempting to execute, a scheme to defraud any healthcare benefit program or obtain, by means of false or fraudulent pretenses, representations, or promises, any of the money or property owned by, or under the custody or control of, any healthcare benefit program, regardless of the payor (e.g., public or private) and knowingly and willfully falsifying, concealing or covering up by any trick or device a material fact or making any materially false statements in connection with the delivery of, or payment for, healthcare benefits, items or services relating to healthcare matters;
- HIPAA, as amended by the Health and Information Technology for Economic and Clinical Health Act of 2009, or HITECH, and their respective implementing regulations, which impose requirements on certain covered healthcare providers, health plans, and healthcare clearinghouses as well as their respective business associates that perform services for them that involve the use, or disclosure of, individually identifiable health information and their covered subcontractors, relating to the privacy, security and transmission of individually identifiable health information without appropriate authorization;
- the federal Physician Payments Sunshine Act, and its implementing regulations, which requires certain manufacturers of drugs, devices, biologicals and medical supplies for which payment is available under Medicare, Medicaid or the Children's Health Insurance Program (with certain exceptions) to report annually to the HHS, information related to payments or other transfers of value made to physicians (defined to include doctors, dentists, optometrists, podiatrists and chiropractors) and teaching hospitals, as well as require certain manufacturers and group purchasing organizations to report annually ownership and investment interests held by such physicians and their immediate family members, and beginning in 2022, will require applicable manufacturers to report information regarding payments and other transfers of value provided in the previous year to physician assistants, nurse practitioners, clinical nurse specialists, certified registered nurse anesthetists, anesthesiologist assistants and certified nurse midwives:
- federal consumer protection and unfair competition laws, which broadly regulate marketplace activities and activities that potentially harm consumers; and
- foreign laws that govern the privacy and security of health information in certain circumstances, many of which differ from each other in significant ways and often are not preempted by or are in conflict with HIPAA, including the European Union General Data Protection Regulation, or the GDPR, which became effective on May 25, 2018, and which imposes privacy and security obligations on any entity that collects and/or processes health data from individuals located in the European Union. Under the GDPR, fines of up to 20 million euros or up to 4% of the annual global turnover of the infringer, whichever is greater, could be imposed for significant non-compliance. As well as complicating our compliance efforts, non-compliance with these laws could result in penalties or significant legal liability. The GDPR includes more stringent operational requirements for processors and controllers of personal data and creates additional rights for data subjects.

Additionally, we are subject to state and foreign equivalents of each of the U.S. healthcare laws described above, among others, some of which may be broader in scope and may apply regardless of the payor.

We have adopted a code of business conduct and ethics, but it is not always possible to identify and deter employee misconduct, and the precautions we take to detect and prevent inappropriate conduct may not be effective in controlling unknown or unmanaged risks or losses or in protecting us from governmental investigations or other actions or lawsuits stemming from a failure to be in compliance with such laws or regulations. Efforts to ensure that our business arrangements will comply with applicable healthcare laws may involve substantial costs. It is possible that governmental and enforcement authorities will conclude that our business practices may not comply with current or future statutes, regulations or case law interpreting applicable fraud and abuse or other healthcare laws and regulations. If any such actions are instituted against us, and we are not successful in defending ourselves or asserting our rights, those actions could have a significant impact on our business, including the imposition of civil,

criminal and administrative penalties, damages, disgorgement, monetary fines, imprisonment, possible exclusion from participation in Medicare, Medicaid and other federal healthcare programs, contractual damages, reputational harm, diminished profits and future earnings, additional reporting requirements and/or oversight if we become subject to a corporate integrity agreement or similar agreement to resolve allegations of non-compliance with these laws, and curtailment of our operations, any of which could adversely affect our ability to operate our business and our results of operations. In addition, the approval and commercialization of any of our product candidates outside the U.S. will also subject us to foreign equivalents of the healthcare laws mentioned above, among other foreign laws.

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

We face an inherent risk of product liability as a result of the clinical testing of our product candidates and will face an even greater risk if we commercialize any products. We may be sued if our product candidates cause or are perceived to cause injury or are found to be otherwise unsuitable during clinical testing, manufacturing, marketing or sale. Any such product liability claims may include allegations of defects in manufacturing, defects in design, a failure to warn of dangers inherent in the product, negligence, strict liability or a breach of warranties. For example, in May 2019, we were added as an additional defendant in an ongoing civil tort lawsuit in federal court in Los Angeles, California. The complaint alleges claims for wrongful death, negligence, breach of fiduciary duty, fraud, medical battery on decedent, medical battery on individual plaintiffs, products liability-failure to warn, breach of express warranty and products liability design or manufacturing defect. Claims could also be asserted under state consumer protection acts. If we cannot successfully defend ourselves against product liability claims, we may incur substantial liabilities or be required to limit or cease commercialization of our product candidates. Even successful defense would require significant financial and management resources. Regardless of the merits or eventual outcome, federal or state liability claims may result in:

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

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

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

On March 27, 2020, President Trump signed into law the Coronavirus Aid, Relief, and Economic Security Act, or CARES Act, which provides temporary relief from certain aspects of the Tax Cuts and Jobs Act that had imposed limitations on the utilization of certain losses, interest expense deductions, and minimum tax credits. We are currently in the process of assessing the tax-related provisions of the CARES Act and its potential impact on us.

As of December 31, 2020, we had aggregate U.S. net operating loss carryforwards of approximately $448.3 million, and aggregate U.S. federal and Texas state research and development credits of approximately $12.5 million and $5.3 million, respectively. These net operating loss carryforwards could expire unused and be unavailable to offset future income tax liabilities. Under the Tax Cuts and Jobs Act and Cares Act, federal net operating losses incurred in taxable years ending after December 31, 2017 may be carried

forward indefinitely, but the deductibility of federal net operating losses generated in tax years beginning after December 31, 2017 may be limited to 80% of current year taxable income for years beginning on or after January 1, 2021. It is uncertain if and to what extent various states will conform to the Tax Cuts and Jobs Act. In addition, under Sections 382 and 383 of the Internal Revenue Code of 1986, as amended, and corresponding provisions of state law, if a corporation undergoes an "ownership change" (which is generally defined as a greater than 50% change (by value) in its equity ownership over a three-year period), the corporation's ability to use its pre-change net operating loss carryforwards and other pre-change tax attributes to offset its post-change income or taxes may be limited. We may have experienced one or more ownership changes in the past, including with respect to our August 2019 public offering, and we may also experience additional ownership changes in the future as a result of subsequent shifts in our stock ownership, some of which may be outside of our control. If an ownership change occurs and our ability to use our net operating loss carryforwards is materially limited, it would harm our future operating results by effectively increasing our future tax obligations.

Risks Related to Government Regulation

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

We have not previously submitted a BLA to the FDA, or similar approval filings to other foreign authorities. A BLA must include extensive preclinical and clinical data and supporting information to establish the product candidate's safety, purity and potency for each desired indication. It must also include significant information regarding the chemistry, manufacturing and controls for the product. We expect the novel nature of our product candidates to create further challenges in obtaining regulatory approval. For example, FDA's Office of Tissues and Advanced Therapies, or OTAT, has limited experience with combination products that include a small molecule component. Approval of our GoCAR-T product candidates, will likely require this FDA office to consult with other divisions of the FDA, which may result in further challenges in obtaining regulatory approval, including in developing final product labeling. The regulatory approval pathway for our product candidates may be uncertain, complex, expensive and lengthy, and approval may not be obtained.

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

- the availability of financial resources to commence and complete our planned clinical trials;
- reaching agreement on acceptable terms with prospective clinical trial sites, the terms of which can be subject to extensive negotiation and may vary significantly among different clinical trial sites;
- recruiting suitable patients to participate in a clinical trial;
- having patients complete a clinical trial or return for post-treatment follow-up;
- clinical trial sites deviating from clinical trial protocol, failing to follow GCPs, or dropping out of a clinical trial;
- adding new clinical trial sites; or
- manufacturing sufficient quantities of qualified materials under cGMPs and applying them on a subject by subject basis for use in clinical trials.

We could also encounter delays if physicians encounter unresolved ethical issues associated with enrolling patients in clinical trials of our 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 IRBs for the institutions in which such clinical trials are being conducted, the Data Monitoring Committee for such clinical trial, or by the FDA or other regulatory authorities due to a number of factors, including failure to conduct the clinical trial in accordance with regulatory requirements or our clinical protocols, inspection of the clinical trial operations or clinical 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. For example, in December 2020 we announced that the FDA had placed a clinical hold on our BPX-601 trial in pancreatic cancer due to the death of a patient in the trial. Although the FDA released the hold in January 2021, there can be no assurance that future patients' deaths in this or any of our clinical trials will not trigger additional clinical holds. 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.

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

Obtaining and maintaining regulatory approval of our product candidates in one jurisdiction does not guarantee that we will be able to obtain or maintain regulatory approval in any other jurisdiction, while a failure or delay in obtaining regulatory approval in one jurisdiction may have a negative effect on the regulatory approval process in others. Approval procedures vary among jurisdictions and can involve requirements and administrative review periods different from, and greater than, those in the EU or U.S., including additional preclinical studies or clinical trials. Studies and clinical trials conducted in one jurisdiction may not be accepted by regulatory authorities in other jurisdictions.

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

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

Any regulatory approvals that we receive for our product candidates will require surveillance to monitor the safety and efficacy of the product candidate. The FDA may also require a Risk Evaluation and Mitigation Strategy, or REMS, in order to approve our product candidates, which could entail requirements for a medication guide, physician communication plans or additional elements to ensure safe use, such as restricted distribution methods, patient registries and other risk minimization tools. In addition, if the FDA or a comparable foreign regulatory authority approves our product candidates, the manufacturing processes, labeling, packaging, distribution, adverse event reporting, storage, advertising, promotion, import, export and recordkeeping for our product candidates will be subject to extensive and ongoing regulatory requirements. These requirements include, among other things, submissions of safety and other post-marketing information and reports, registration, as well as continued compliance with cGMPs and GCPs for any clinical trials that we conduct post-approval. Later discovery of previously unknown problems with our product candidates, including adverse events of unanticipated severity or frequency, or with our third-party manufacturers or manufacturing processes, or failure to comply with regulatory requirements, may result in, among other things:

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

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

Foreign legislative changes may also affect our ability to commercialize our product candidates. Effective as of May 25, 2018, the GDPR imposes privacy and security obligations on any entity that collects and/or processes personal information from individuals located in the European Union. Under the GDPR, fines of up to 20 million euros or up to 4% of the annual global turnover of the infringer, whichever is greater, could be imposed for significant non-compliance.

Even if we obtain regulatory approval of our product candidates, the products may not gain market acceptance among physicians, patients, hospitals, cancer treatment centers, third-party payors and others in the medical community.

The use of engineered T cells as potential cancer treatments is a recent development and may not become broadly accepted by physicians, patients, hospitals, cancer treatment centers, third-party payors and others in the medical community. Many factors will influence whether our product candidates are accepted in the market, including:

- the clinical indications for which our product candidates are approved;
- physicians, hospitals, cancer treatment centers and patients considering our product candidates as a safe and effective treatment;
- the potential and perceived advantages of our product candidates over alternative treatments;
- the prevalence and severity of any side effects;
- product labeling or product insert requirements of the FDA or other regulatory authorities;
- limitations or warnings contained in the labeling approved by the FDA or other regulatory authorities;
- the extent and quality of the clinical evidence supporting the efficacy and safety of our product candidates;
- the timing of market introduction of our product candidates as well as competitive products;
- the cost of treatment in relation to alternative treatments;
- the pricing of our product candidates and the availability of adequate reimbursement by third-party payors and government authorities;
- the willingness and ability of patients to pay out-of-pocket in the absence of coverage by third-party payors, including government authorities;
- relative convenience and ease of administration, including as compared to alternative treatments and competitive therapies;
- confusion or lack of understanding regarding the effects of rimiducid and the timing and size of dosing of rimiducid after immune cell therapy; and
- the effectiveness of our sales and marketing efforts.

In addition, although we are not utilizing embryonic stem cells or replication competent vectors, adverse publicity due to the ethical and social controversies surrounding the therapeutic use of such technologies, and reported side effects from any clinical trials using these technologies or the failure of such clinical trials to demonstrate that these therapies are safe and effective may limit market acceptance our product candidates. If our product candidates are approved but fail to achieve market acceptance among physicians, patients, hospitals, cancer treatment centers or others in the medical community, we will not be able to generate significant revenue.

Even if our products achieve market acceptance, we may not be able to maintain that market acceptance over time if new products or technologies are introduced that are more favorably received than our products, are more cost effective or render our products obsolete.

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

Market acceptance and sales of our product candidates will depend in large part on global reimbursement policies and may be affected by future healthcare reform measures, both in the United States and other key international markets. Patients who are prescribed medicine for the treatment of their conditions generally rely on third-party payors to reimburse all or part of the costs associated with their prescription drugs. Patients are unlikely to use our products unless coverage is provided and reimbursement is adequate to cover a significant portion of the cost of our products. Therefore, successful commercialization of our products will depend in part on the availability of governmental and third-party payor reimbursement for the cost of our product candidates and/or payment to the physician for administering our product candidates. In the United States, no uniform policy of coverage and reimbursement for drug products exists among third-party payors. Therefore, coverage and reimbursement for drug products can differ significantly from payor to payor. As a result, the coverage determination process is often a time-consuming and costly process that will require us to provide scientific and clinical support for the use of our products to each payor separately, with no assurance that coverage and adequate reimbursement will be obtained. One third-party payor’s decision to cover a particular medical product or service does not assure that other payors will also provide coverage for the medical product or service, or to provide coverage at an adequate reimbursement rate. As a result, the coverage determination process will require us to provide scientific and clinical support for the use of our products to each payor separately, with no assurance that adequate coverage and

reimbursement will be obtained. Further, a third-party payor's decision to provide coverage for a medical product or service does not imply that an adequate reimbursement rate will be approved. The market for our product candidates will depend significantly on access to third-party payors' formularies or lists of treatments for which third-party payors provide coverage and reimbursement. Third party payors may also have difficulty in determining the appropriate coverage of our product candidates, if approved, due to the fact that they are combination products that include a small molecule drug, rimiducid.

Third-party payors establish coverage and reimbursement policies for new products, including our product candidates. In particular, in the United States, private health insurers and other third-party payors often provide reimbursement for treatments based on the level at which the government (through the Medicare or Medicaid programs) provides reimbursement for such treatments. In the United States, the EEA and other significant or potentially significant markets for our product candidate, government authorities and third-party payors are increasingly attempting to limit or regulate the price of medical products and services, particularly for new and innovative products and therapies, which has resulted in lower average selling prices. Further, the increased emphasis on managed healthcare in the United States and on country and regional pricing and reimbursement controls in Canada and the EEA will put additional pressure on product pricing, coverage, reimbursement and utilization, which may adversely affect our product sales and results of operations. These pressures can arise from policies and practices of managed care groups, judicial decisions and governmental laws and regulations related to Medicare, Medicaid and healthcare reform, coverage and reimbursement policies and pricing in general. Any reduction in reimbursement from Medicare or other government programs may result in a similar reduction in payments from private payors.

In March 2010, the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act, or collectively, the PPACA, became law in the United States. PPACA substantially changed the way healthcare is financed by both governmental and private insurers and significantly affects the pharmaceutical industry. Among the provisions of the PPACA of greatest importance to the pharmaceutical industry are the following: (i) an annual, nondeductible fee on any entity that manufactures or imports certain branded prescription drugs and biologic agents, apportioned among these entities according to their market share in certain government healthcare programs; (ii) an increase in the rebates a manufacturer must pay under the Medicaid Drug Rebate Program to 23.1% and 13% of the average manufacturer price for branded and generic drugs, respectively; (iii) a new Medicare Part D coverage gap discount program, in which manufacturers must now agree to offer 70% point-of-sale discounts to 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; (iv) extension of manufacturers' Medicaid rebate liability to covered drugs dispensed to individuals who are enrolled in Medicaid managed care organizations; (v) expansion of eligibility criteria for Medicaid programs by, among other things, allowing states to offer Medicaid coverage to additional individuals with income at or below 133% of the Federal Poverty Level, thereby potentially increasing manufacturers' Medicaid rebate liability; (vi) expansion of the entities eligible for discounts under the Public Health Service pharmaceutical pricing program; (vii) expansion of health care fraud and abuse laws, including the federal civil False Claims Act and the Anti-Kickback Statute, new government investigative powers, and enhanced penalties for noncompliance; and (viii) 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 other aspects of the PPACA. Concurrently, Congress has considered legislation that would repeal or repeal and replace all or part of the PPACA. While Congress has not passed comprehensive repeal legislation, several bills affecting the implementation of certain taxes under the PPACA have been signed into law. For example, the Tax Cuts and Jobs Act of 2017, or Tax Act, includes a provision repealing, effective January 1, 2019, the tax-based shared responsibility payment imposed by the PPACA 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". Additionally, the 2020 federal spending package permanently eliminated, effective January 1, 2020, the PPACA-mandated "Cadillac" tax on high-cost employer-sponsored health coverage and medical device tax and, effective January 1, 2021, also eliminated the health insurer tax. On December 14, 2018, a Texas U.S. District Court Judge ruled that the PPACA is unconstitutional in its entirety because the "individual mandate" was repealed by Congress as part of the Tax Act. Additionally, on December 18, 2019, the U.S. Court of Appeals for the 5th Circuit upheld the District Court ruling that the individual mandate was unconstitutional and remanded the case back to the District Court to determine whether the remaining provisions of the PPACA are invalid as well. The U.S. Supreme Court is currently reviewing the case, although it is unknown when a decision will be made. Further, although the U.S. Supreme Court has not yet ruled on the constitutionality of the PPACA, on January 28, 2021, President Biden issued an executive order to initiate a special enrollment period from February 15, 2021 through May 15, 2021 for purposes of obtaining health insurance coverage through the PPACA 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 PPACA. It is unclear how the Supreme Court ruling, other such litigation, and the healthcare reform measures of the Biden administration will impact the PPACA and our business.

In addition, other legislative changes have been proposed and adopted in the United States since the PPACA was enacted. For example, through the process created by the Budget Control Act of 2011, there are automatic reductions of Medicare payments to providers up to 2% per fiscal year, which went into effect in April 2013 and, following passage of the Bipartisan Budget Act of 2018, will remain in effect through 2030 with the exception of a temporary suspension from May 1, 2020 through March 31, 2021 unless additional Congressional action is taken. In January 2013, President Obama signed into law the American Taxpayer Relief Act of 2012, which, among other things, further reduced Medicare payments to several providers.

Further, recently there has been heightened governmental scrutiny in the United States over the manner in which drug manufacturers set prices for their marketed products, in light of the rising cost of prescription drugs and biologics. Such scrutiny has resulted in several recent congressional inquiries and proposed federal legislation designed to, among other things, bring more transparency to product pricing, review the relationship between pricing and manufacturer patient programs, and reform government program reimbursement methodologies for products. At the federal level, the Trump administration used several means to propose or implement drug pricing reform, including through federal budget proposals, executive orders and policy initiatives. For example, on July 24, 2020 and September 13, 2020, the Trump administration announced several executive orders related to prescription drug pricing that seek to implement several of the administration's proposals. As a result, the FDA released a final rule on September 24, 2020, effective November 30, 2020, providing guidance for states to build and submit importation plans for drugs from Canada. Further, on November 20, 2020, HHS finalized a regulation removing safe harbor protection for price reductions from pharmaceutical manufacturers to plan sponsors under Medicare Part D, either directly or through pharmacy benefit managers, unless the price reduction is required by law. The implementation of the rule has been delayed by the Biden administration from January 1, 2022 to January 1, 2023 in response to ongoing litigation. The rule also creates a new safe harbor for price reductions reflected at the point-of-sale, as well as a new safe harbor for certain fixed fee arrangements between pharmacy benefit managers and manufacturers, the implementation of which have also been delayed pending review by the Biden administration until March 22, 2021. On November 20, 2020, CMS issued an interim final rule implementing the Trump administration's Most Favored Nation executive order, which would tie Medicare Part B payments for certain physician-administered drugs to the lowest price paid in other economically advanced countries, effective January 1, 2021. On December 28, 2020, the U.S. District Court in Northern California issued a nationwide preliminary injunction against implementation of the interim final rule. It is unclear whether the Biden administration will work to reverse these measures or pursue similar policy initiatives. At the state level, legislatures are increasingly passing legislation and implementing 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 expect that additional federal and state healthcare reform measures will be adopted in the future, any of which could result in reduced demand for our products or other adverse effects on our business. For example, it is possible that additional governmental action is taken to address the COVID-19 pandemic.

We expect that additional federal and state healthcare reform measures, such as further amendments and changes to the PPACA will be adopted in the future, any of which could result in reduced demand for our products or other adverse effects on our business.

Certain countries have a very difficult reimbursement environment and we may not obtain reimbursement or pricing approval, if required, in all countries where we expect to market a product, or we may obtain reimbursement approval at a level that would make marketing a product in certain countries not viable.

We expect to experience pricing pressures in connection with the sale of any products that we may develop, due to the trend toward managed healthcare, the increasing influence of health maintenance organizations and additional legislative proposals. If we fail to successfully secure and maintain adequate coverage and reimbursement for our products or are significantly delayed in doing so, we will have difficulty achieving market acceptance of our products and expected revenue and profitability which would have a material adverse effect on our business, prospects, financial condition and results of operations.

Due to the novel nature of our technology and the small size of our target patient populations, we face uncertainty related to pricing and reimbursement for these product candidates.

Our target patient populations for our potential product candidates are relatively small, as a result, the pricing and reimbursement of our product candidates, if approved, must be adequate to support commercial and manufacturing infrastructure. If we are unable to obtain adequate levels of reimbursement, our ability to successfully market and sell our product candidates will be adversely affected. The manner and level at which reimbursement is provided for services related to our product candidates, for example, reimbursement for administration of our product candidates to patients, is also important. Inadequate reimbursement for such services may lead to physician resistance and adversely affect our ability to market or sell our products.

We are subject to extensive laws and regulations related to data privacy, and our failure to comply with these laws and regulations could harm our business.

We are subject to laws and regulations governing data privacy and the protection of personal information. These laws and regulations govern our processing of personal data, including the collection, access, use, analysis, modification, storage, transfer, security breach notification, destruction and disposal of personal data. There are foreign and state law versions of these laws and regulations to which we are currently and/or may in the future, be subject. For example, the collection and use of personal health data in the European Union is governed by the GDPR. The GDPR, which is wide-ranging in scope, imposes several requirements relating to the consent of the individuals to whom the personal data relates, the information provided to the individuals, the security and confidentiality of the personal data, data breach notification and the use of third-party processors in connection with the processing of personal data. The GDPR also imposes strict rules on the transfer of personal data out of the European Union to the United States, provides an enforcement authority and imposes large monetary penalties for noncompliance. The GDPR requirements apply not only to third-party transactions, but also to transfers of information within our company, including employee information. The GDPR and similar data privacy laws of other jurisdictions place significant responsibilities on us and create potential liability in relation to personal data that we or our third-party service providers process, including in clinical trials conducted in the United States and European Union. In addition, we expect that there will continue to be new proposed laws, regulations and industry standards relating to privacy and data protection in the United States, the European Union and other jurisdictions, and we cannot determine the impact such future laws, regulations and standards may have on our business.

Additionally, California recently enacted legislation that has been dubbed the first "GDPR-like" law in the United States. Known as the California Consumer Privacy Act, or the CCPA, it creates new individual privacy rights for consumers (as that word is broadly defined in the law) and places increased privacy and security obligations on entities handling personal data of consumers or households. As of January 1, 2020, the CCPA requires covered companies to provide new disclosures to California consumers, provide such consumers new ways to opt-out of certain sales of personal information, and allow for a new cause of action for data breaches. As currently written, the CCPA will likely impact (possibly significantly) our business activities and exemplifies the vulnerability of our business to not only cyber threats but also the evolving regulatory environment related to personal data and protected health information.

We are subject to certain U.S. and foreign anti-corruption, anti-money laundering, export control, sanctions, and other trade laws and regulations, or collectively, Trade Laws. We can face serious consequences for violations.

Among other matters, Trade Laws prohibit companies and their employees, agents, clinical research organizations, legal counsel, accountants, consultants, contractors, and other partners from authorizing, promising, offering, providing, soliciting, or receiving directly or indirectly, corrupt or improper payments or anything else of value to or from recipients in the public or private sector. Violations of Trade Laws can result in substantial criminal fines and civil penalties, imprisonment, the loss of trade privileges, debarment, tax reassessments, breach of contract and fraud litigation, reputational harm, and other consequences. We have direct or indirect interactions with officials and employees of government agencies or government-affiliated hospitals, universities, and other organizations. We engage third parties for clinical trials and/or to obtain necessary permits, licenses, patent registrations, and other regulatory approvals. We also expect our non-U.S. activities to increase in time. We can be held liable for the corrupt or other illegal activities of our personnel, agents, or partners, even if we do not explicitly authorize or have prior knowledge of such activities.

We are subject to U.S. and certain foreign export and import controls, sanctions, embargoes, anti-corruption laws, and anti-money laundering laws and regulations. Compliance with these legal standards could impair our ability to compete in domestic and international markets. We can face criminal liability and other serious consequences for violations, which can harm our business.

We are subject to export control and import laws and regulations, including the U.S. Export Administration Regulations, U.S. Customs regulations, various economic and trade sanctions regulations administered by the U.S. Treasury Department's Office of Foreign Assets Controls, the U.S. Foreign Corrupt Practices Act of 1977, as amended, or FCPA, the U.S. domestic bribery statute contained in 18 U.S.C. § 201, the U.S. Travel Act, the USA PATRIOT Act, and other state and national anti-bribery and anti-money laundering laws in the countries in which we conduct activities. Anti-corruption laws are interpreted broadly and prohibit companies and their employees, agents, contractors, and other collaborators from authorizing, promising, offering, or providing, directly or indirectly, improper payments or anything else of value to recipients in the public or private sector. We may engage third parties for clinical trials outside of the United States, to sell our products abroad once we enter a commercialization phase, and/or to obtain necessary permits, licenses, patent registrations, and other regulatory approvals. We have direct or indirect interactions with officials and employees of government agencies or government-affiliated hospitals, universities, and other organizations. We can be held liable for the corrupt or other illegal activities of our employees, agents, contractors, and other collaborators, even if we do not explicitly authorize or have actual knowledge of such activities. Any violations of the laws and regulations described above may result in substantial civil and criminal fines and penalties, imprisonment, the loss of export or import privileges, debarment, tax reassessments, breach of contract and fraud litigation, reputational harm, and other consequences.

Changes in funding for the FDA, the SEC and other government agencies could hinder their ability to hire and retain key leadership and other personnel, prevent new products from being developed or commercialized in a timely manner or otherwise

prevent those agencies from performing normal functions on which the operation of our business may rely, which could negatively impact our business.

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

Disruptions at the FDA and other agencies may also slow the time necessary for new drugs to be reviewed and/or approved by necessary government agencies, which would adversely affect our business. For example, over the last several years, including beginning on December 22, 2018 and ending on January 25, 2019, the U.S. government has shut down several times and certain regulatory agencies, such as the FDA and the SEC, have had to furlough critical FDA, SEC and other government employees and stop critical activities. If repeated or prolonged government shutdowns occur, it could significantly impact the ability of the FDA to timely review and process our regulatory submissions, which could have a material adverse effect on our business. Further, future government shutdowns could impact our ability to access the public markets and obtain necessary capital in order to properly capitalize and continue our operations.

Risks Related to Our Intellectual Property

We depend on intellectual property licensed from third parties and termination of any of these licenses could result in the loss of significant rights, which would harm our business.

We are dependent on patents, know-how and proprietary technology, both our own and licensed from others. We license from Baylor College of Medicine, or Baylor, certain intellectual property related to methods for activating antigen presenting cells, to certain genetic constructs and to certain methods for inducing apoptosis. Baylor may terminate or modify our licenses in the event of a material breach by us that remains uncured following the date that is 90 days after written notice of such breach or upon certain insolvency events that remain uncured following the date that is 30 days following written notice of such insolvency event. In addition, we have funded certain of our clinical development activities and may fund certain of our future clinical development with funds from the State of Texas. The State of Texas may have rights to commercialize the results of those clinical trials if it determines that we have failed, after notice and an opportunity to cure, to use diligent and commercially reasonable efforts to commercialize or otherwise bring to practical application the results of the funded clinical trials. We are also dependent on our license agreements with Agensys, Inc. (a subsidiary of Astellas Pharma, Inc.) with respect to PSCA-targeted CARs, and BioVec Pharma Inc. with respect to making retrovirus for all of our programs. The termination of any of these licenses could have a material adverse effect on our business.

Any termination of these agreements, or other agreements to which we are a party could result in the loss of significant rights and could harm our ability to commercialize our product candidates.

Disputes may also arise between us and our licensors and other partners regarding intellectual property subject to a license agreement, including:

- the scope of rights granted under the license agreement and other interpretation-related issues;
- whether and the extent to which our technology and processes 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;
- our diligence obligations with respect to the use of the licensed technology in relation to our development and commercialization of our product candidates, and what activities satisfy those diligence obligations; 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.

If disputes over intellectual property that we have licensed prevent or impair our ability to maintain our current licensing arrangements on acceptable terms, we may be unable to successfully develop and commercialize the affected product candidates.

We are generally also subject to all of the same risks with respect to protection of intellectual property that we license, as we are for intellectual property that we own. If we or our licensors fail to adequately protect this intellectual property, our ability to commercialize products could suffer.

If our efforts to protect the proprietary nature of our technologies are not adequate, we may not be able to compete effectively in our market.

Any disclosure to or misappropriation by third parties of our confidential proprietary information could enable competitors to quickly duplicate or surpass our technological achievements, thus eroding our competitive position in our market. Certain intellectual property which is covered by our in-license agreements has been developed at academic institutions which have retained non-commercial rights to such intellectual property.

There are several pending U.S. and foreign patent applications in our portfolio, and we anticipate additional patent applications will be filed both in the U.S. and in other countries, as appropriate. However, we cannot predict:

- if and when patents will issue;
- the degree and range of protection any issued patents will afford us against competitors including whether third parties will find ways to invalidate or otherwise circumvent our patents;
- whether or not others will obtain patents claiming aspects similar to those covered by our patents and patent applications; or
- whether we will need to initiate litigation or administrative proceedings which may be costly whether we win or lose.

Composition of matter patents for biological and pharmaceutical products are generally considered to be the strongest form of intellectual property. We cannot be certain that the claims in our pending patent applications directed to compositions of matter for our product candidates will be considered patentable by the U.S. Patent and Trademark Office, or the USPTO, or by patent offices in foreign countries, or that the claims in any of our issued patents will be considered valid by courts in the U.S. or foreign countries. Method of use patents have claims directed to the use of a product for the specified method. This type of patent does not prevent a competitor from making and marketing a product that is identical to our product for an indication that is outside the scope of the patented method. Moreover, even if competitors do not actively promote their product for our targeted indications, physicians may prescribe these products “off-label.” Although off-label prescriptions may infringe or contribute to the infringement of method of use patents, the practice is common and such infringement is difficult to prevent or prosecute.

The strength of patents in the biotechnology and pharmaceutical field involves complex legal and scientific questions and can be uncertain. The patent applications that we own or in-license may fail to result in issued patents with claims that cover our product candidates or uses thereof in the U.S. or in other foreign countries. Even if the patents do successfully issue, third parties may challenge the validity, enforceability or scope thereof, which may result in such patents being narrowed, invalidated or held unenforceable. Furthermore, even if they are unchallenged, patents in our portfolio may not adequately exclude third parties from practicing relevant technology or prevent others from designing around our claims. If the breadth or strength of our intellectual property position with respect to our product candidates is threatened, it could dissuade companies from collaborating with us to develop, and threaten our ability to commercialize, our product candidates. Further, if we encounter delays in our clinical trials, the period of time during which we could market our product candidates under patent protection would be reduced. Since patent applications in the U.S. and most other countries are confidential for a period of time after filing, it is possible that patent applications in our portfolio may not be the first filed patent applications related to our product candidates. Furthermore, for U.S. applications in which all claims are entitled to a priority date before March 16, 2013, an interference proceeding can be provoked by a third-party or instituted by the USPTO, to determine who was the first to invent any of the subject matter covered by the patent claims of our applications. For U.S. applications containing a claim not entitled to priority before March 16, 2013, there is a greater level of uncertainty in the patent law with the passage of the America Invents Act (2012) which brings into effect significant changes to the U.S. patent laws that are yet untried and untested, and which introduces new procedures for challenging pending patent applications and issued patents. A primary change under this reform is creating a “first to file” system in the U.S. This will require us to be cognizant going forward of the time from invention to filing of a patent application.

We rely on trade secret protection and confidentiality agreements to protect proprietary know-how that is not patentable, processes for which patents are difficult to enforce and any other elements of our product discovery and development processes that involve proprietary know-how, information, or technology that is not covered by patents. We require all of our employees to assign their inventions to us, and require all of our employees, consultants, advisors and any third parties who have access to our proprietary know-how, information, or technology to enter into confidentiality agreements; however, it is possible that our trade secrets and other confidential proprietary information could be disclosed or that competitors may otherwise gain access to our trade secrets or independently develop substantially equivalent information and techniques. Furthermore, the laws of some foreign countries do not protect proprietary rights to the same extent or in the same manner as the laws of the U.S. As a result, we may encounter significant problems in protecting and defending our intellectual property both in the U.S. and abroad. If we are unable to prevent unauthorized material disclosure of our intellectual property to third parties, we will not be able to establish or maintain a competitive advantage in our market, which could materially adversely affect our business, operating results and financial condition.

Third-party claims of intellectual property infringement may prevent or delay our product discovery and development efforts.

Our commercial success depends in part on our avoiding infringement of the patents and proprietary rights of third parties. There is a substantial amount of litigation involving patents and other intellectual property rights in the biotechnology and pharmaceutical industries, as well as administrative proceedings for challenging patents, including interference and reexamination proceedings before the USPTO or oppositions and other comparable proceedings in foreign jurisdictions. Recently, under U.S. patent reform, new procedures including inter parties review and post grant review have been implemented. As stated above, this reform is untried and untested and will bring uncertainty to the possibility of challenge to our patents in the future. Numerous U.S. and foreign issued patents and pending patent applications, which are owned by third parties, exist in the fields in which we are developing our product candidates. As the biotechnology and pharmaceutical industries expand and more patents are issued, the risk increases that our product candidates may give rise to claims of infringement of the patent rights of others.

Third parties may assert that we are employing their proprietary technology without authorization. There may be third-party patents, of which we are currently unaware or have not sufficiently analyzed with claims to materials, formulations, methods of manufacture or methods for treatment related to the use or manufacture of our product candidates. Because patent applications can take many years to issue, there may be currently pending patent applications which may later result in issued patents that our product candidates may infringe. In addition, third parties may obtain patents in the future and claim that use of our technologies infringes upon these patents. If any third-party patents were held by a court of competent jurisdiction to cover aspects of our formulations, the manufacturing process of our product candidates, constructs or molecules used in or formed during the manufacturing process, methods of use, including combination therapy or patient selection methods or any final product itself, the holders of any such patents may be able to block our ability to develop and commercialize the product candidate unless we obtained a license under the applicable patents, or until such patents expire or they are finally determined to be held invalid or unenforceable. In either case, such a license may not be available on commercially reasonable terms or at all. If we are unable to obtain a necessary license to a third-party patent 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.

Parties making claims against us may seek and obtain injunctive or other equitable relief, which could effectively block our ability to further develop and commercialize our product candidates. Defense of these claims, regardless of their merit, would involve substantial litigation expense and would be a substantial diversion of employee resources from our business. In the event of a successful claim of infringement against us, we may have to pay substantial damages, including treble damages and attorneys' fees for willful infringement, obtain one or more licenses from third parties, pay royalties or redesign our infringing products, which may be impossible or require substantial time and monetary expenditure. It is possible that any such license would not be available at all or on commercially reasonable terms. Furthermore, even in the absence of litigation, we may need to obtain licenses from third parties to advance our research or allow commercialization of our product candidates. We may fail to obtain any of these licenses at a reasonable cost or on reasonable terms, if at all. In that event, we would be unable to further develop and commercialize our product candidates, which could harm our business significantly.

For example, we are aware of a third-party patent having claims directed to chimeric DNA comprising DNA segments encoding (1) a single chain antibody domain and (2) transmembrane and cytoplasmic domains of an endogenous protein. Even though we have reason to believe that our product candidates are not covered by claims of this patent, an owner or licensee of the patent still might bring a patent infringement suit against us. If the patent is asserted against us, we may not prevail in defending against claims of infringement and/or challenging the validity of claims in the patent. We may not successfully develop alternative technologies or enter into an agreement by which we obtain rights to the patent. These rights, if necessary, may not be available on terms acceptable to us.

We are aware of third-party patents having claims that may be considered as being directed to single-chain antibody fragments that bind to PSCA and these patents may be considered relevant to BPX-601 and related technologies we are developing. We currently are evaluating whether or not we need to obtain rights to these patents under a license, and if it is determined that we need to obtain such rights, whether these rights can be obtained. We are also aware of third-party patent applications having claims that may be considered as being directed to cellular therapy constructs utilizing a heterodimer domain for activation of caspase 9. We are monitoring these applications and if they are granted with the claims as drafted, they may be relevant to our potential dual-switch product candidates containing such a heterodimer activation domain.

Also, while we are aware there are other third-party patents having claims that may be considered relevant to technologies for which we are seeking, or plan to seek, regulatory approval, we believe those patents have a patent term that may expire prior to the time we expect to obtain regulatory approval for these technologies. The estimated expiration dates for those patents were determined according to information on the face pages of the patents, and certain factors that could influence patent term, such as patent term adjustment and patent term extension, for example, were not factored into these estimates. Accordingly, the estimated expiration dates of those patents may not be accurate and one or more of those patents may not expire before we obtain regulatory approval for an applicable technology. Owners or licensees of one or more of those patents may bring a patent infringement suit against us. If one or more of those patents are asserted against us, we may be able to assert a defense for a safe harbor to patent infringement under 35 U.S.C. 271(e)(1) if certain requirements are met. It is possible that (1) certain of these requirements may not

be met, and/or (2) one or more of the third-party patents might expire after one or more of our technologies obtain regulatory approval, and consequently we may not successfully assert such a defense to patent infringement. If we are unsuccessful in asserting a defense under 35 U.S.C. 271(e)(1), it is possible we may not prevail in defending against claims of infringement and/or challenging the validity of claims in those patents. We may not successfully develop alternative technologies or enter into agreements by which we obtain rights to applicable patents. These rights, if necessary, may not be available on terms acceptable to us.

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.

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 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. 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.

The licensing and acquisition of third-party intellectual property rights is a competitive area, and companies, which 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.

We may not be able to successfully complete negotiations and ultimately acquire the rights to the intellectual property that we may seek to acquire in the future.

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

Competitors may infringe our patents or the patents of our licensors. To counter infringement or unauthorized use, we may be required to file infringement claims, which can be expensive and time-consuming. In addition, in an infringement proceeding, a court may decide that one or more of our patents is not valid or is unenforceable, or may refuse to stop the other party from using the technology at issue on the grounds that our patents do not cover the technology in question. An adverse result in any litigation or defense proceedings could put one or more of our patents at risk of being invalidated, held unenforceable, or interpreted narrowly and could put our patent applications at risk of not issuing. Defense of these claims, regardless of their merit, would involve substantial litigation expense and would be a substantial diversion of employee resources from our business. It also is possible that a competitor we sue for patent infringement could countersue us for allegedly infringing one or more of their own patents or one or more patents they licensed from another entity. In the event of a successful claim of infringement against us, we may have to pay substantial damages, including treble damages and attorneys' fees for willful infringement, obtain one or more licenses from third parties, pay royalties or redesign our infringing products, which may be impossible or require substantial time and monetary expenditure.

Interference proceedings provoked by third parties or brought by the USPTO may be necessary to determine the priority of inventions with respect to our patents or patent applications or those of our licensors. An unfavorable outcome could result in a loss of our patent rights and could require us to cease using the related technology 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 a license on commercially reasonable terms. It also is possible that third parties could institute a patent office post-grant proceeding against one or more of our patents, or one or more patents licensed to us, such as a post grant review proceeding, inter parties review proceeding or reexamination proceeding at the USPTO, or an opposition proceeding in a jurisdiction outside the U.S. An unfavorable outcome in a post-grant proceeding could result in a loss of our patent rights. Litigation, interference proceedings or patent office post-grant proceedings may result in a decision adverse to our interests and, even if we are successful, may result in substantial costs and distract our management and other employees. We also may not be able to prevent, alone or with our licensors, misappropriation of our trade secrets or confidential information, particularly in countries where the laws may not protect those rights as fully as in the U.S.

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. If securities analysts or investors perceive these results to be negative, it could have a substantial adverse effect on the price of our common stock.

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

Periodic maintenance fees on any issued patent are due to be paid to the USPTO and foreign patent agencies in several stages over the lifetime of the patent. The USPTO and various foreign governmental patent agencies require compliance with a number of procedural, documentary, fee payment and other similar provisions during the patent application process. While an inadvertent lapse can in many cases be cured by payment of a late fee or by other means in accordance with the applicable rules, there are situations in which noncompliance can result in abandonment or lapse of the patent or patent application, resulting in partial or complete loss of patent rights in the relevant jurisdiction. Noncompliance events that could result in abandonment or lapse of a patent or patent application include, but are not limited to, failure to respond to official actions within prescribed time limits, non-payment of fees and failure to properly legalize and submit formal documents. Such noncompliance events are outside of our direct control for (1) non-U.S. patents and patent applications owned by us, and (2) patents and patent applications licensed to us by another entity. In such an event, our competitors might be able to enter the market, which would have a material adverse effect on our business.

Issued patents covering our product candidates could be found invalid or unenforceable if challenged in court or the USPTO.

If we or one of our licensing partners initiate legal proceedings against a third party to enforce a patent covering one of our product candidates, the defendant could counterclaim that the patent covering our product candidate, as applicable, is invalid and/or unenforceable. In patent litigation in the U.S., defendant counterclaims alleging invalidity and/or unenforceability are commonplace, and there are numerous grounds upon which a third party can assert invalidity or unenforceability of a patent. Third parties may also raise similar claims before administrative bodies in the U.S. or abroad, even outside the context of litigation. Such mechanisms include re-examination, post grant review, and equivalent proceedings in foreign jurisdictions, for example, opposition proceedings. Any such proceedings could result in revocation or amendment to our patents in such a way that they no longer cover our product candidates. The outcome following legal assertions of invalidity and unenforceability is unpredictable. With respect to the validity question, for example, we cannot be certain that there is no invalidating prior art and that prior art that was cited during prosecution, but not relied on by the patent examiner, will not be revisited. If a defendant were to prevail on a legal assertion of invalidity and/or unenforceability, we would lose at least part, and perhaps all, of the patents directed to our product candidates. A loss of patent rights could have a material adverse impact on our business.

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

As is the case with other biopharmaceutical companies, our success is heavily dependent on intellectual property, particularly patents. Obtaining and enforcing patents in the biopharmaceutical industry involve both technological and legal complexity, and is therefore costly, time-consuming and inherently uncertain. In addition, the U.S. has recently enacted and is currently implementing wide-ranging patent reform legislation. Recent U.S. Supreme Court rulings have narrowed the scope of patent protection available in certain circumstances and weakened the rights of patent owners in certain situations. In addition to increasing uncertainty with regard to our ability to obtain patents in the future, this combination of events has created uncertainty with respect to the value of patents, once obtained. Depending on decisions by the U.S. Congress, the federal courts, and the USPTO, the laws and regulations governing patents could change in unpredictable ways that would weaken our ability to obtain new patents or to enforce our existing patents and patents that we might obtain in the future. For example, in the recent case, Assoc. for Molecular Pathology v. Myriad Genetics, Inc., the U.S. Supreme Court held that certain claims to DNA molecules are not patentable. While we do not believe that any of the patents owned or licensed by us will be found invalid based on this decision, we cannot predict how future decisions by the courts, the U.S. Congress or the USPTO may impact the value of our patents.

We have limited foreign intellectual property rights and may not be able to protect our intellectual property rights throughout the world.

We have limited intellectual property rights outside the U.S. Filing, prosecuting and defending patents on product candidates in all countries throughout the world would be prohibitively expensive, and our intellectual property rights in some countries outside the U.S. can be less extensive than those in the U.S. In addition, the laws of some foreign countries do not protect intellectual property to the same extent as federal and state laws in the U.S. Consequently, we may not be able to prevent third parties from practicing our inventions in all countries outside the U.S., or from selling or importing products made using our inventions in and into the U.S. or other jurisdictions. Competitors may use our technologies in jurisdictions where we have not obtained patents to develop their own products and further, may export otherwise infringing products to territories where we have patents, but enforcement is not as strong as that in the U.S. These products may compete with our products and our patents or other intellectual property rights may not be effective or sufficient to prevent them from competing.

Many companies have encountered significant problems in protecting and defending intellectual property in foreign jurisdictions. The legal systems of certain countries, particularly China and certain other developing countries, do not favor the enforcement of patents, trade secrets and other intellectual property, particularly those relating to biopharmaceutical products, which could make it difficult for us to stop the infringement of our patents or marketing of competing products in violation of our proprietary rights generally. To date, we have not sought to enforce any issued patents in these foreign jurisdictions. Proceedings to enforce our patent rights in foreign jurisdictions could result in substantial costs and divert our efforts and attention from other aspects of our business, could put our patents at risk of being invalidated or interpreted narrowly and our patent applications at risk of not issuing and could provoke third parties to assert claims against us. We may not prevail in any lawsuits that we initiate, and the damages or other remedies awarded, if any, may not be commercially meaningful. The requirements for patentability may differ in certain countries, particularly developing countries. Furthermore, generic drug manufacturers or other competitors may challenge the scope, validity or enforceability of our or our licensors' patents, requiring us or our licensors to engage in complex, lengthy and costly litigation or other proceedings. Certain countries in Europe and developing countries, including China and India, have compulsory licensing laws under which a patent owner may be compelled to grant licenses to third parties. In those countries, we and our licensors may have limited remedies if patents are infringed or if we or our licensors are compelled to grant a license to a third party, which could materially diminish the value of those patents. This could limit our potential revenue opportunities. Accordingly, our efforts to enforce our intellectual property rights around the world may be inadequate to obtain a significant commercial advantage from the intellectual property that we develop or license.

We may be subject to claims that our employees, consultants or independent contractors have 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 used or disclosed confidential information of these third parties or our employees' former employers. Litigation may be necessary to defend against these claims. Even if we are successful in defending against these claims, litigation could result in substantial cost and be a distraction to our management and employees.

Risks Related to Ownership of our Common Stock

If we fail to satisfy applicable listing standards, our common stock may be delisted from the Nasdaq Capital Market.

Our ability to publicly or privately sell equity securities and the liquidity of our common stock could be adversely affected if we are delisted from The Nasdaq Capital Market or if we are unable to transfer our listing to another stock market. On April 27, 2020, we were notified by The Nasdaq Stock Market LLC, or Nasdaq, that we were in breach of Listing Rule 5450(b)(2)(A), or the Market Value Rule, for continued listing on The Nasdaq Global Market because the market value of our listed securities for 30 consecutive business days had been less than $50 million. In lieu of seeking compliance with the Market Value Rule, on June 16, 2020, we received approval from Nasdaq to transfer the listing of our common stock from The Nasdaq Global Market to The Nasdaq Capital Market, which became effective at the opening of business on June 18, 2020. Although we were able to transfer our listing to The Nasdaq Capital Market, we could subsequently fail to satisfy Nasdaq's requirements for continued listing on The Nasdaq Capital Market and receive notice from Nasdaq that our stock may become subject to delisting.

If we are unable to continue to meet the requirements for listing on the Nasdaq Capital Market and our common stock is delisted by Nasdaq, it could lead to a number of negative implications, including an adverse effect on the price of our common stock, increased volatility in our common stock, reduced liquidity in our common stock, the loss of federal preemption of state securities laws and greater difficulty in obtaining financing.

In addition, delisting of our common stock could deter broker-dealers from making a market in or otherwise seeking or generating interest in our common stock, could result in a loss of current or future coverage by certain sell-side analysts and might deter certain institutions and persons from investing in our securities at all. Delisting could also cause a loss of confidence of our customers, collaborators, vendors, suppliers and employees, which could harm our business and future prospects.

If our common stock is delisted by The Nasdaq Capital Market, the price of our common stock may decline, and although our common stock may be eligible to trade on the OTC Bulletin Board, another over-the-counter quotation system, or on the pink sheets, an investor may find it more difficult to dispose of their common stock or obtain accurate quotations as to the market value of our common stock. Further, if we are delisted, we would incur additional costs under state blue sky laws in connection with any sales of our securities. These requirements could severely limit the market liquidity of our common stock and the ability of our shareholders to sell our common stock in the secondary market.

The price of our stock is volatile and you could lose all or part of your investment.

Prior to our December 2014 IPO, there was no public market for our common stock. The trading price of our common stock is likely to continue to be highly volatile and subject to wide fluctuations in response to various factors, some of which are beyond our control, including market conditions in general and a limited trading volume for our shares. In addition to the factors discussed in this "Risk Factors" section and elsewhere in our Annual Report, these factors include:

- the commencement, enrollment or results of the planned clinical trials of our product candidates or any future clinical trials we may conduct, or changes in the development status of our product candidates;
- any delay in our regulatory filings for our product candidates and any adverse development or perceived adverse development with respect to the applicable regulatory authority's review of such filings, including without limitation the FDA's issuance of a "refusal to file" letter or a request for additional information;
- adverse results or delays in our ongoing or future clinical trials;
- our decision to initiate a clinical trial, not to initiate a clinical trial or to terminate an existing clinical trial;
- adverse regulatory decisions, including failure to receive regulatory approval of our product candidates;
- changes in laws or regulations applicable to our products, including but not limited to clinical trial requirements for approvals;
- adverse developments concerning our CID technology platform and our small molecule drug rimiducid;
- adverse developments concerning our contract manufacturers;
- changes in the structure of healthcare payment systems;
- our inability to maintain successful collaborations or to establish new collaborations if needed;
- our failure to commercialize our product candidates;
- additions or departures of key scientific or management personnel;
- unanticipated serious safety concerns related to the use of our product candidates;
- introduction of new products or services offered by us or our competitors;
- announcements of significant acquisitions, strategic partnerships, joint ventures or capital commitments by us or our competitors;
- our ability to effectively manage our growth;
- the size and growth of our initial target markets;
- our ability to successfully treat additional types of diseases and cancers or at different stages;
- actual or anticipated variations in quarterly operating results;
- our cash position;
- our failure to meet the estimates and projections of the investment community or that we may otherwise provide to the public;
- publication of research reports about us or our industry, or immunotherapy in particular, or positive or negative recommendations or withdrawal of research coverage by securities analysts;
- changes in the market valuations of similar companies;
- overall performance of the equity markets;
- sales of our common stock by us or our stockholders in the future;
- trading volume of our common stock;
- changes in accounting practices;
- ineffectiveness of our internal controls;
- disputes or other developments relating to proprietary rights, including patents, litigation matters and our ability to obtain patent protection for our technologies;
- significant lawsuits, including patent or stockholder litigation;

- general political and economic conditions; and
- other events or factors, many of which are beyond our control.

In addition, the stock market in general, and biopharmaceutical companies in particular, have experienced extreme price and volume fluctuations that have often been unrelated or disproportionate to the operating performance of these companies. Broad market and industry factors may negatively affect the market price of our common stock, regardless of our actual operating performance. In the past, securities class action litigation has often been instituted against companies following periods of volatility in the market price of a company's securities. This type of litigation, if instituted, could result in substantial costs and a diversion of management's attention and resources, which would harm our business, operating results or financial condition.

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

We currently anticipate that we will retain future earnings for the development, operation and expansion of our business and do not anticipate declaring or paying any cash dividends for the foreseeable future.

Our principal stockholders own a significant percentage of our stock and can exert significant control over matters subject to stockholder approval.

Holders of 5% or more of our capital stock and their respective affiliates beneficially own a significant portion of our voting stock, including shares subject to outstanding options. As a result, if these shareholders were to choose to act together, they would have the ability to significantly influence all matters requiring stockholder approval. For example, these stockholders may be able to significantly influence elections of directors, amendments of our organizational documents, or approval of any merger, sale of assets, or other major corporate transaction. This may prevent or discourage unsolicited acquisition proposals or offers for our common stock that you may feel are in your best interest as one of our stockholders.

As of December 31, 2019, we are no longer an "emerging growth company" and, as a result, are required to comply with increased disclosure and governance requirements.

As more than five fiscal years have passed since the December 18, 2014, listing of common stock listing on the Nasdaq, we ceased to be an "emerging growth company" as defined in the JOBS Act as of December 31, 2019. However, we currently qualify as a "Smaller Reporting Company" under applicable SEC rules, which limits some of the otherwise applicable public company requirements. Below are specific requirements to which we are now subject that did not previously apply to us. These requirements include the "say on pay" provisions (requiring a non-binding stockholder vote to approve compensation of certain executive officers) and the "say on golden parachute" provisions (requiring a non-binding stockholder vote to approve golden parachute arrangements for certain executive officers in connection with mergers and certain other business combinations) of the Dodd-Frank Act and some of the disclosure requirements of the Dodd-Frank Act relating to compensation of our chief executive officer.

Compliance with such requirements is expensive and time-consuming for management, as the loss of "emerging growth company" status and compliance with the additional requirements substantially increases our legal and financial compliance costs and makes some activities more time-consuming and costly.

Changes in accounting rules, assumptions and/or judgments could materially and adversely affect us.

Accounting rules and interpretations for certain aspects of our operations are highly complex and involve significant assumptions and judgment. These complexities could lead to a delay in the preparation and dissemination of our financial statements. Furthermore, changes in accounting rules and interpretations or in our accounting assumptions and/or judgments, such as asset impairments, could significantly impact our financial statements. In some cases, we could be required to apply a new or revised standard retroactively, resulting in restating prior period financial statements. Any of these circumstances could have a material adverse effect on our business, prospects, liquidity, financial condition and results of operations.

Our consolidated financial statements, including our liabilities and statements of operations are subject to quarterly changes in our accounting of our outstanding Series 1 Preferred Stock, warrants and related option fee proceeds.

In accordance with ASC Topic 815, *Accounting for Derivative Instruments and Hedging Activities*, and ASC Topic 480, *Liabilities-Distinguishing from Equity*, convertible preferred shares are accounted for as temporary equity and warrants are accounted for as liabilities at their fair value during periods where they can be net cash settled in case of a change in control transaction. The warrants are accounted for as a liability at their fair value at each reporting period. The value of the derivative warrant liability is re-measured at each reporting period with changes in fair value recorded in earnings. To derive an estimate of the fair value of these warrants, the binomial model is utilized, adjusted for the effect of dilution, which embodies all of the requisite assumptions (including trading volatility, estimated terms, dilution and risk-free rates) necessary to determine the fair value of these instruments. This process requires the development of significant and subjective estimates that may, and are likely to, change over the duration of the instrument with related changes in internal and external market factors. Additionally, in connection with our August 2019 private placement we received option fee proceeds, or the Option Fee, which is accounted for as

a liability. The value of the Option Fee is re-measured at each reporting period with changes in fair value recorded through earnings. As a result, our consolidated financial statements and results of operations may fluctuate quarterly, based on factors, such as the trading value of our common stock and certain assumptions, which are outside of our control. Consequently, our liabilities and consolidated statements of operations may vary quarterly, based on factors other than our revenues and expenses. The liabilities and accounting line items associated with our derivative securities on our balance sheet and statement of operations are non-cash items, and the inclusion of such items in our financial statements may materially affect the outcome of our quarterly and annual results, even though such items are non-cash and do not affect the cash we have available for operations. Investors should take such derivative accounting matters and other non-cash items into account when comparing our quarter-to-quarter and year-to-year operating results and financial statements.

Sales of a substantial number of shares of our common stock by our existing stockholders in the public market could cause our stock price to fall.

Certain holders of our outstanding shares of common stock, are entitled to rights with respect to the registration of their shares under the Securities Act of 1933, as amended, or the Securities Act. Any sales of these shares by such stockholders could have a material adverse effect on the trading price of our common stock.

We register on Form S-8 all shares of common stock that are issuable under our 2019 Equity Incentive Plan, as amended, or the EIP. As a consequence, these shares can be freely sold in the public market upon issuance, subject to volume limitations applicable to affiliates.

Future sales and issuances of our common stock or rights to purchase common stock, including pursuant to our EIP and shelf registration statement, could result in additional dilution of the percentage ownership of our stockholders and could cause our stock price to fall.

We expect that significant additional capital will be needed in the future to continue our planned operations, including conducting clinical trials, expanded research and development activities and costs associated with operating a public company. To raise capital, we may sell common stock, convertible securities or other equity securities in one or more transactions at prices and in a manner we determine from time to time, including pursuant to our shelf registration statement on Form S-3 that we filed with the SEC. If we sell common stock, convertible securities or other equity securities, investors may be materially diluted by subsequent sales. Any such sales may also result in material dilution to our existing stockholders, and new investors could gain rights, preferences and privileges senior to the existing holders of our common stock.

We completed a public offering of our Series 1 preferred stock on August 21, 2019 and are obligated to issue shares of Series 2 and Series 3 preferred stock in connection with the concurrent private placement, and if we are required to redeem shares of preferred stock, our cash position will be negatively impacted. In addition, we may not have sufficient funds to redeem such shares of preferred stock.

We issued 575,000 shares of Series 1 preferred stock in connection with our August 2019 public offering and are obligated to issue up to 350,000 shares of Series 2 preferred stock and 250,000 shares of Series 3 preferred stock pursuant to the purchase agreement governing our August 2019 private placement.

Subject to the terms of our certificate of incorporation, at any time on or after August 21, 2024, some or all of our outstanding shares of preferred stock will be redeemable at the option of the holder at a redemption price of $100.00 per share of Series 1 and Series 2 preferred stock and $140.00 per share of Series 3 preferred stock, upon delivery of an irrevocable written notice to us. If a holder of preferred stock requests redemption we will be required to redeem such shares of preferred stock. However, we may be unable to redeem such preferred stock if restrictions under applicable law or contractual obligations prohibit such redemption. For example, Delaware law provides that a redemption on capital stock may only be paid from “surplus” or, if there is no “surplus,” from a corporation’s net profits for the then-current or the preceding fiscal year. Unless we operate profitably, our ability to redeem the preferred stock would require the availability of adequate “surplus,” which is defined as the excess, if any, of our net assets (total assets less total liabilities) over our capital. To date, we have operated at a loss. Accordingly, if we do not have sufficient “surplus” under Delaware law, we would be unable to effect such redemption. If we do have sufficient “surplus” to effect such redemption, our available cash will be negatively impacted and our ability to use the net proceeds from this offering could be substantially limited. In addition, such reduction in our available cash could decrease the trading price of our common stock, and, accordingly, the preferred stock and our warrants.

The issuance or sale of shares of our common stock, or rights to acquire shares of our common stock, including the issuance of our securities pursuant to our August 2019 private placement, could depress the trading price of our common stock.

Under the terms of the private placement transaction, we are obligated to issue (i) up to 350,000 shares of Series 2 preferred stock, at a purchase price of $100.00 per share, and related warrants to purchase up to 2,800,000 shares of our common stock at an exercise price of $10.00 per share, and (ii) 250,000 shares of Series 3 preferred stock, at a purchase price of $140.00 per share, and related warrants to purchase up to 875,000 shares of our common stock at an exercise price of $14.00 per share, for aggregate gross proceeds of up to $70,000,000, to certain institutional investors in two or more separate closings, each to occur at such investors’

discretion. In addition, we may conduct future offerings of our common stock, preferred stock or other securities that are convertible into or exercisable for our common stock to finance our operations or fund acquisitions, or for other purposes. If we issue additional shares of our common stock or rights to acquire shares of our common stock, if any of our existing stockholders sells a substantial amount of our common stock, or if the market perceives that such issuances or sales may occur, then the trading price of our common stock, and, accordingly, the trading price of our common stock may significantly decrease. In addition, our issuance of additional shares of common stock will dilute the ownership interests of our existing common stockholders.

Certain investors in the private placement will have the ability to control or significantly influence certain business decisions.

Pursuant to the terms of the securities purchase agreement for the private placement transaction, certain investors in the private placement transaction have consent rights over certain significant matters of the Company's business. These include decisions to authorize or issue equity securities that are senior or pari passu to the Series 3 preferred stock with respect to liquidation preference, the incurrence of indebtedness in excess of $1,000,000, the sale or license of the Company's iMC switch technology and the payment of dividends. As a result, these stockholders, acting together, will have significant influence over certain matters affecting our business.

Anti-takeover provisions under our charter documents and Delaware law could delay or prevent a change of control which could limit the market price of our common stock and may prevent or frustrate attempts by our stockholders to replace or remove our current management.

Our amended and restated certificate of incorporation and amended and restated bylaws contain provisions that could delay or prevent a change of control of our company or changes in our board of directors that our stockholders might consider favorable. Some of these provisions include:

- a board of directors divided into three classes serving staggered three-year terms, such that not all members of the board will be elected at one time;
- a prohibition on stockholder action through written consent, which requires that all stockholder actions be taken at a meeting of our stockholders;
- a requirement that special meetings of stockholders be called only by the chairman of the board of directors, the chief executive officer, or by a majority of the total number of authorized directors;
- advance notice requirements for stockholder proposals and nominations for election to our board of directors;
- a requirement that no member of our board of directors may be removed from office by our stockholders except for cause and, in addition to any other vote required by law, upon the approval of not less than two-thirds of all outstanding shares of our voting stock then entitled to vote in the election of directors;
- a requirement of approval of not less than two-thirds of all outstanding shares of our voting stock to amend any bylaws by stockholder action or to amend specific provisions of our certificate of incorporation; and
- the authority of the board of directors to issue convertible preferred stock on terms determined by the board of directors without stockholder approval and which convertible preferred stock may include rights superior to the rights of the holders of common stock.

In addition, because we are incorporated in Delaware, we are governed by the provisions of Section 203 of the Delaware General Corporate Law, which may prohibit certain business combinations with stockholders owning 15% or more of our outstanding voting stock. These anti-takeover provisions and other provisions in our amended and restated certificate of incorporation and amended and restated bylaws could make it more difficult for stockholders or potential acquirers to obtain control of our board of directors or initiate actions that are opposed by the then-current board of directors and could also delay or impede a merger, tender offer or proxy contest involving our company. These provisions could also discourage proxy contests and make it more difficult for you and other stockholders to elect directors of your choosing or cause us to take other corporate actions you desire. Any delay or prevention of a change of control transaction or changes in our board of directors could cause the market price of our common stock to decline.

Our amended and restated certificate of incorporation and amended and restated bylaws provide 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 and our bylaws provide that, unless we consent in writing to the selection of an alternative forum, the Court of Chancery of the State of Delaware is the exclusive forum for (i) any derivative action or proceeding brought on our behalf; (ii) any action asserting a claim of breach of a fiduciary duty owed by any of our directors, officers or other employees to us or our stockholders; (iii) any action asserting a claim against us or any of our directors, officers or other employees arising pursuant to any provision of the Delaware General Corporation Law, our amended and restated certificate

of incorporation or our amended and restated bylaws; or (iv) any action asserting a claim against us or any of our directors, officers or other employees governed by the internal affairs doctrine.

These provisions would not apply to suits brought to enforce a duty or liability created by the Exchange Act. Furthermore, Section 22 of the Securities Act creates concurrent jurisdiction for federal and state courts over all such Securities Act actions. Accordingly, both state and federal courts have jurisdiction to entertain such claims.

These exclusive forum provisions may limit a stockholder's ability to bring a claim in a judicial forum that it finds favorable for disputes with us or our directors, officers, or other employees, which may discourage lawsuits against us and our directors, officers and other employees. If a court were to find either exclusive-forum provision to be inapplicable or unenforceable in an action, we may incur further significant additional costs associated with resolving the dispute in other jurisdictions, all of which could seriously harm our business.

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

The trading market for our common stock depends in part on the research and reports that securities or industry analysts publish about us or our business. In the event securities or industry analysts that cover us downgrade our stock or publish inaccurate or unfavorable research about our business, our stock price may decline. If one or more of these analysts ceases coverage of us or fails to publish reports on us regularly, demand for our stock could decrease, which might cause our stock price and trading volume to decline.

ITEM 1B. Unresolved Staff Comments

None.

ITEM 2. Properties

As of December 31, 2020, the Company leased the following principle physical properties:

Location	Facilities
Houston, Texas	28,345 square feet for administrative and research and development activities
South San Francisco	13,943 square feet for office space

Leases for these leased facilities expire in the years 2022 and 2023. We believe our facilities are suitable and adequate for our current needs, and that we will be able to locate additional facilities as needed.

ITEM 3. Legal Proceedings

The information set forth under the “Litigation” subheading in Note 8 - Commitments and Contingencies of Notes to Consolidated Financial Statements in Part II, Item 8 of this Annual Report on Form 10-K is incorporated herein by reference.

ITEM 4. Mine Safety Disclosures

Not applicable.

PART II

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

Market Information

Our common stock is currently listed on The Nasdaq Capital Market under the symbol "BLCM".

Holders of Record

As of March 22, 2021, there were approximately 14 stockholders of record of our common stock. Certain shares are held in "street" name and thus the actual number of beneficial owners of such shares is not known or included in the foregoing number.

Dividend Policy

We have never declared or paid any dividends on our common stock. We currently intend to retain all available funds and any future earnings to support our operations and finance the growth and development of our business and we do not anticipate paying any cash dividends in the foreseeable future. Any future determination related to our dividend policy will be made at the discretion of our board of directors and will depend upon, among other factors, our results of operations, financial condition, capital requirements, contractual restrictions, business prospects and other factors our board of directors may deem relevant.

Securities Authorized for Issuance under Equity Compensation Plans

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

Recent Sales of Unregistered Securities

None.

ITEM 6. Selected Financial Data

We have elected to comply with Item 301 of Regulations S-K, as amended February 10, 2021, and are omitting this disclosure in reliance thereon.

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

The following discussion and analysis should be read in conjunction with "Item 6. Selected Financial Data" and the financial statements and related notes included in "Item 8 - Financial Statements and Supplementary Data" in this Annual Report on Form 10-K. The following discussion contains forward-looking statements that involve risks and uncertainties. Our actual results could differ materially from those expressed or implied in any forward-looking statements as a result of various factors, including those set forth under the caption "Item 1A. Risk Factors."

On February 5, 2020, we filed a Certificate of Amendment of the Amended and Restated Certificate of Incorporation with the Secretary of State of the State of Delaware to (i) effect a reverse stock split of all issued and outstanding shares of our common stock at a ratio of 1-for-10 and (ii) reduce the number of authorized shares of our common stock from 200,000,000 to 40,000,000.

On February 5, 2020, we effected a reverse stock split of all issued and outstanding shares of our common stock at a ratio of 1-for-10, and reduced the number of authorized shares of our common stock from 200,000,000 to 40,000,000. Share related amounts have been retroactively adjusted in this Annual Report on Form 10-K to reflect this reverse stock-split for all periods presented.

Overview

We are a clinical stage biopharmaceutical company focused on discovering and developing novel, controllable cellular immunotherapies for various forms of cancer. We are advancing CAR-T cell therapies which are an innovative approach in which a patient's or donor's T cells, are genetically modified to carry chimeric antigen receptors, or CARs. We are using our proprietary Chemical Induction of Dimerization, or CID, technology platform to engineer our product candidates with switch technologies that are designed to control components of the immune system in real time. By incorporating our CID platform, our product candidates may offer better efficacy and safety outcomes than are seen with current cellular immunotherapies. For additional information about our business, and candidate development programs, see the discussions contained within "Item 1. Business" in this Annual Report.

Results of Operations

The following table sets forth our results of operations for the periods indicated:

	Year Ended		
(in thousands)	December 31, 2020	December 31, 2019	Change
Revenues	$ 500	$ 7,143	$ (6,643)
Operating expenses:			
Research and development	39,052	64,535	(25,483)
General and administrative	15,531	29,972	(14,441)
Total operating expenses	54,583	94,507	(39,924)
Other operating income (expense)			
Impairment	(1,265)	—	(1,265)
Gain on dispositions, net	3,656	—	3,656
Total other operating income (expense)	2,391	—	2,391
Loss from operations	(51,692)	(87,364)	30,890
Other income (expense):			
Interest income	387	1,351	(964)
Interest expense	(2,659)	(4,280)	1,621
Change in fair value of warrant and private placement option liabilities	46,130	(19,192)	65,322
Gain on extinguishment of debt	112	—	112
Other expense	—	(2,992)	2,992
Total other income (expense)	43,970	(25,113)	69,083
Net loss	$ (7,722)	$ (112,477)	$ 99,973

Revenues

The Company's decrease for the year ended December 31, 2020, compared to the year ended December 31, 2019, was due to the Company receiving $0.5 million related to maintenance of its license agreement with the MD Anderson Cancer Center supporting the ongoing use of its CaspaCIDe safety switch as its only source of revenue. In the year ended December 31, 2019, the Company received the initial $5 million licensing fee from the same agreement and unrelated grant revenue.

Research and Development Expenses (R&D)

The decrease in R&D expenses for the year ended December 31, 2020, compared to the year ended December 31, 2019, was primarily due to reduced expenses related to rivo-cel related activities, the sale of the manufacturing facility, and the reduction in force that was implemented during the second half of the year ended December 31, 2019, partially offset by an increase in expenses related to our GoCAR-T programs. This resulted in $9.0 million reduction in salaries, benefits, travel, and share based compensation related charges and a $12.2 million reduction in general R&D expenses primarily due to lower clinical trial activities. Additionally, depreciation expense decreased $4.3 million due to the manufacturing facility and related laboratories and office space meeting the accounting standards criteria of assets held for sale, which were then disposed of in April 2020.

General and Administrative Expenses (G&A)

The decrease in G&A expenses for the year ended December 31, 2020, compared to the year ended December 31, 2019, was primarily due the reduction in rivo-cel related commercialization activities that reduced charges by $13.7 million as well as the aforementioned reduction in force that reduced employee related charges by $0.7 million.

Impairment

In October 2020, in connection with the Company's restructuring plan, our management elected to seek an exit to its leased R&D facility in Houston, Texas. As a result of this decision, the Company reclassified the assets and liabilities associated with the leased facility as held for sale. The reclassified assets included a right-of-use asset of $0.5 million, and property plant and equipment of $2.3 million. Based on the cost to exit the lease and the net realizable value of the related assets the Company recognized an impairment charge of $1.3 million in the year ended December 31, 2020.

Gain on dispositions, net

The increase in gain on dispositions, net for the year ended December 31, 2020 over the prior year was primarily due to the disposal of the manufacturing facility to M.D. Anderson in April 2020.

Other Income (Expense)

Other income primarily consists of changes in the fair value of our warrant liability and the private placement option liability, partially offset by interest expense.

For the year ended December 31, 2020, the Company had other income of $43.9 million versus the year ended December 31, 2019, total other expense of $25.1 million. The difference is primarily attributable to $46.1 million gain related to the changes in fair value of our warrant and private placement option liabilities, which are remeasured at each reporting period, and a reduction in interest expense to $2.6 million with the early retirement of the Oxford Loan.

Liquidity and Capital Resources

Sources of Liquidity

At December 31, 2020, we had an accumulated deficit of approximately $540.7 million, a net loss of approximately $7.7 million, negative cash flows from operations of approximately $56.7 million, and cash, cash equivalents, and restricted cash of $37.0 million.

Our cash resources are primarily consumed by operating activities and we expect negative cash flows from operations to continue for at least the next 12 months. Our primary uses of capital are, and we expect will continue to be, compensation and related expenses, third-party clinical research and development services, laboratory services, clinical trial costs, legal and other regulatory expenses and general overhead costs. Based on our current research and development plans and our timing expectations related to the progress of our programs, we believe that our cash and cash equivalents will be sufficient to fund our operating expenses and capital expenditure requirements through at least the next twelve months from the date the accompanying annual financial statements are issued.

We plan to continue to attempt to obtain financing and/or engage in strategic transactions, but we cannot predict, with certainty, the outcome of our actions to generate liquidity, including the availability of additional equity or debt financing, or whether such actions would generate the expected liquidity as currently planned. As a result of the COVID-19 pandemic and actions taken to slow its spread, the global credit and financial markets have experienced extreme volatility, including diminished liquidity and credit availability, declines in consumer confidence, declines in economic growth, increases in unemployment rates and uncertainty about economic stability. There can be no assurance that further deterioration in credit and financial markets and confidence in economic conditions will not occur. If equity and credit markets deteriorate, it may make any necessary debt or equity financing more difficult to obtain, more costly and/or more dilutive.

On August 16, 2019, we entered into an underwritten public offering of 575,000 shares of our Series 1 Preferred Stock and warrants to purchase up to 5,750,000 shares of our common stock. Each share of Series 1 Preferred Stock was sold together with a warrant to purchase 10 shares of common stock at a combined price to the public of $100.00. The net proceeds to us were approximately $53.9 million, net of issuance costs, and excluded any proceeds that we may receive upon exercise of the warrants.

On August 16, 2019, we entered into a securities purchase agreement to which we agreed to issue in a private placement (i) 350,000 shares of our Series 2 Preferred Stock, at a purchase price of $100.00 per share, and related warrants to purchase up to 2,800,000 shares of our common stock at an exercise price of $10.00 per share, and (ii) 250,000 shares of our Series 3 Preferred Stock, at a purchase price of $140.00 per share, and related warrants to purchase up to 875,000 shares of our common stock at an exercise price of $14.00 per share. The purchase and sale of the securities issuable under this agreement may occur in two or more separate closings, within five days' notice to us. The Company received $11.2 million, net, in proceeds from the issuance of the private placement option.

On January 17, 2020, we entered into an Asset Purchase Agreement with The University of Texas M.D. Anderson Cancer Center, as amended by the First Amendment to Asset Purchase Agreement dated February 21, 2020, in connection with the sale of certain of our assets. Pursuant to the Asset Purchase Agreement, we agreed to sell to M.D. Anderson certain assets and liabilities relating to our manufacturing facility and related laboratories and office space located at 2130 W. Holcombe Blvd., Houston, Texas 77030. On April 14, 2020, we completed the Asset Sale. Upon closing of the Asset Sale, M.D. Anderson paid us an amount equal to $15.0 million, subject to certain escrow provisions and a reduction for prepayment of rent under an associated sublease agreement.

In November 2020, we closed an underwritten offering of 1,040,000 shares of common stock, pre-funded warrants to purchase 3,109,378 shares of common stock, and accompanying common warrants to purchase up to an aggregate of 4,149,378 shares of common stock. Each share of common stock and pre-funded warrant to purchase one share of common stock was sold together with a common warrant to purchase one share of common stock. The public offering price of each share of common stock and accompanying common warrant was $6.025 and $6.024 for each pre-funded warrant. The pre-funded warrants are immediately exercisable at a price of $0.001 per share of common stock. The common warrants are immediately exercisable at an exercise price of $6.50 per share of common stock and will expire five years from the date of issuance. The shares of common stock and pre-funded warrants, and the accompanying common warrants, were issued separately and were immediately separable upon issuance. The gross proceeds to us were approximately $25.0 million before deducting underwriting discounts and commissions and other offering expenses.

Cash Flows

Operating Activities

Net cash used in operating activities during the year ended December 31, 2020, was $56.7 million compared to $77.6 million for the same period last year. The primary operating activities during the year ended December 31, 2020, were (1) $7.7 million of net losses and (2) a $8.2 million decrease from changes in operating assets and liabilities, (3) a $46.1 million change in fair market value of warrant derivative and private placement option liabilities, and (4) $3.6 million of gain on dispositions, net. These activities were partially offset by non-cash charges from impairment of property and equipment of $1.4 million and other smaller non-cash charge items.

Investing Activities

Net cash provided by investing activities during the year ended December 31, 2020, was $14.1 million compared to $48.9 million for the same period last year. The net cash provided by investing activities during the year ended December 31, 2020, was primarily due to proceeds of $14.7 million from the sale certain assets in the transaction with M.D. Anderson during 2020. The cash increase was partially offset by purchases of property and equipment of $0.6 million.

Financing Activities

Net cash used in financing activities during the year ended December 31, 2020, was $14.2 million compared to $74.1 million provided for the same period last year. The net cash used in financing activities during the year ended December 31, 2020, was primarily due to the principal payments and the subsequent early retirement of debt totaling $37.1 million partially offset by proceeds from the issuance of common stock and pre-funded warrants, net in the amount of $22.9 million.

Debt

In October 2020, we executed a payoff letter to repay in full outstanding indebtedness and terminate all commitments and obligations under our Loan and Security Agreement, dated December 21, 2017, as amended, with Oxford Finance LLC. Pursuant to the payoff letter, we remitted payment of $27.4 million.

Off-Balance Sheet Arrangements

We do not have any off-balance sheet arrangements (as defined by applicable regulations of the SEC) that are reasonably likely to have a current or future material effect on our financial condition, results of operations, liquidity, capital expenditures or capital resources. We do not have any relationships with unconsolidated entities or financial partnerships, such as entities often referred to as structured finance or special purpose entities, which would have been established for the purpose of facilitating off-balance sheet arrangements or for any other contractually narrow or limited purpose.

Critical Accounting Policies and Significant Estimates

Management's discussion and analysis of our financial condition and results of operations are based on our financial statements, which are prepared in accordance with U.S. generally accepted accounting principles, or GAAP. The preparation of these financial statements requires us to make estimates and assumptions that affect the reported amounts of assets, liabilities, revenues, costs and expenses and related disclosures. We base our estimates on historical experience and on various other assumptions that we believe to be reasonable under the circumstances. In many instances, we could have reasonably used different accounting estimates, and in other instances changes in the accounting estimates are reasonably likely to occur from period to period. Accordingly, actual results could differ significantly from management’s estimates under different assumptions or conditions. To the extent that there are material differences between these estimates and actual results, our future financial statement presentation, financial condition, results of operations and cash flows will be affected. While our significant accounting policies are described in the notes to our financial statements, we believe that the accounting policies discussed below are critical to understanding our historical and future performance, as these policies related to the more significant areas involving management’s judgments and estimates. Our management has discussed the development and selection of these critical accounting estimates with the audit committee of our board of directors and the audit committee has reviewed the company's disclosure relating to it in this MD&A.

Warrant Derivatives

Freestanding warrants exercisable for multiple instruments are classified as liabilities. The Company accounts for these warrants in accordance with ASC Topic 815, *Accounting for Derivative Instruments and Hedging Activities* (“ASC 815”). The Company estimates the fair value of these liabilities using the binomial option model. The option pricing model of our warrant derivative liabilities are estimates and are sensitive to changes to certain inputs used in the pricing model. See Note 1 - Organization, Basis of Presentation, and Summary of Significant Accounting Policies for a discussion of how the Company accounts for its warrant derivatives.

Private Placement Option

The Company has entered into a security purchase agreement that contains a call option on preferred shares that are puttable outside the control of the Company. The Company accounts for the option in accordance with ASC Topic 815, *Accounting for Derivative Instruments and Hedging Activities* ("ASC 815"). The Company estimates the fair value of the liability using a binomial lattice model. The model is sensitive to changes to certain inputs. See Note 1 - Organization, Basis of Presentation, and Summary of Significant Accounting Policies for a discussion of how the Company accounts for its private placement option derivative.

Research and Development

Research and development expenses consist of expenses incurred in performing research and development activities, including compensation and benefits for research and development employees and consultants, facilities expenses, overhead expenses, cost of laboratory supplies, manufacturing expenses, fees paid to third parties and other outside expenses. We accrue for costs incurred as the services are being provided by monitoring the status of the clinical trial or project and the invoices received from our external service

providers. We adjust our accrual as actual costs become known. See Note 1 - Organization, Basis of Presentation, and Summary of Significant Accounting Policies for a discussion of how the Company accounts for research and development expenses.

Share-Based Compensation

The Company's share-based awards include stock option grants and restricted stock awards. The estimated fair value for stock options, which determines the Company's calculation of compensation expense, is based on the Black-Scholes pricing model, which requires a number of estimates, including the expected lives of awards, interest rates, stock volatility and other assumptions. Additionally, we apply a forfeiture rate to estimate the number of grants that will ultimately vest, as applicable, and adjust the expense as these awards vest. See Note 1 - Organization, Basis of Presentation, and Summary of Significant Accounting Policies for a discussion of how the Company accounts for share-based compensation.

Recently Issued Accounting Pronouncements

See Note 1 - Organization, Basis of Presentation, and Summary of Significant Accounting Policies for discussion regarding recent accounting pronouncements.

ITEM 7A. Quantitative and Qualitative Disclosures About Market Risk

We had cash, cash equivalents and marketable securities totaling $37.0 million and $93.8 million at December 31, 2020 and 2019, respectively. Our cash is deposited in checking accounts with reputable financial institutions. The primary objective of our investment activities, of our cash equivalents and marketable securities, is to preserve our capital to fund our operations. We seek to realize income from our investments without assuming significant risk and we do not enter into investments for trading or speculative purposes.

Interest Rate Fluctuation Risk

A portion of our investments may be subject to interest rate risk and could fall in value if market interest rates increase. However, because our investments are primarily short-term in duration, we believe that our exposure to interest rate risk is not significant and a 1% movement in market interest rates would not have a significant impact on the total value of our portfolio. We actively monitor changes in interest rates.

Foreign Currency Risk

We are exposed to changes in foreign currency exchange rates. We have contracts with entities in areas outside the U.S. that are denominated in a foreign currency. Most of our assets are located within the U.S. and are not subject to changes in foreign currency exchange rates, however a portion of our operating expense is denominated in foreign currencies, primarily pounds sterling and euros. We do not engage in any hedging transactions to mitigate the effect of changes in foreign currency exchange rates. While the effect of changes in foreign currency exchange rates has not had a material effect on our financial results or financial condition to date, we cannot assure you that fluctuations in foreign currency exchange rates will not have a material effect on our future results.

ITEM 8. Financial Statements and Supplementary Data

Index to Financial Statements

The financial statements of Bellicum Pharmaceuticals, Inc. listed below are set forth in Item 8 of this Annual Report for the year ended December 31, 2020:

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Report of Independent Registered Public Accounting Firm

To the Stockholders and the Board of Directors of Bellicum Pharmaceuticals, Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Bellicum Pharmaceuticals, Inc. (the Company) as of December 31, 2020 and 2019, the related consolidated statements of operations and comprehensive loss, redeemable convertible preferred stock and stockholders' (deficit) equity and cash flows for each of the two years in the period ended December 31, 2020, 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, 2020 and 2019, and the results of its operations and its cash flows for each of the two years in the period ended December 31, 2020, 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 (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.

Critical Audit Matter

The critical audit matter communicated below is a matter arising from the current period audit of the financial statements that was communicated or required to be communicated to the audit committee and that: (1) relates to accounts or disclosures that are material to the financial statements and (2) involved our especially challenging, subjective or complex judgments. The communication of the critical audit matter does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matter below, providing a separate opinion on the critical audit matter or on the accounts or disclosures to which it relates.

Private placement option liability and warrant liability valuation of Bellicum Pharmaceuticals

Description of the Matter	The Company's warrant derivative liability and the private placement option liability are remeasured at fair value on each balance sheet date and are valued at $10.3 million and $7.8 million, respectively, as of December 31, 2020. As explained in Note 2 to the consolidated financial statements, the Company holds freestanding warrants that are exercisable for multiple underlying instruments that are potentially redeemable, and the Company is a party to a private placement option security purchase agreement that contains a call option on preferred shares that are puttable outside the control of the Company. Auditing management's calculation of estimated fair value remeasurements of the warrant derivative liability and private placement option liability was complex and judgmental due to the use of a complex valuation model and the level of uncertainty involved in management's assumptions used in the measurement process. In particular, management was required to estimate a volatility assumption at December 31, 2020.
How We Addressed the Matter in Our Audit	Our substantive audit procedures included, among others, evaluating the methodology and testing the significant assumption stated above and the accuracy and completeness of the underlying data used in management's warrant derivative liability and private placement option liability valuation assessments. To test the volatility, we compared the assumption to historical information and performed a sensitivity analysis to evaluate the impact of changes in the fair value estimate that would result from changes in the underlying assumption. We also involved our valuation specialists to assist in the evaluation of the complex valuation model and the volatility assumption in the fair value estimates.

/s/ Ernst & Young LLP

We have served as the Company's auditor since 2014.

Houston, Texas

March 30, 2021

Bellicum Pharmaceuticals, Inc.
Consolidated Balance Sheets
(in thousands, except par value and share data)

	December 31,	
	2020	2019
ASSETS		
Current assets:		
Cash and cash equivalents	$ 35,495	$ 91,028
Restricted cash	1,501	2,788
Accounts receivable, interest and other receivables	2	303
Prepaid expenses and other current assets	802	884
Assets held for sale	1,643	16,851
Total current assets	39,443	111,854
Operating lease right-of-use assets	645	1,042
Property and equipment, net	189	2,529
Other assets	307	825
Total assets	$ 40,584	$ 116,250
LIABILITIES, PREFERRED STOCK AND STOCKHOLDERS' DEFICIT		
Current liabilities:		
Accounts payable	$ 891	$ 2,643
Accrued expenses and other current liabilities	4,165	9,770
Warrant derivative liability	10,345	52,184
Private placement option liability	7,803	12,094
Current portion of long-term debt	—	11,000
Current portion of lease liabilities	825	454
Liabilities held for sale	672	6,273
Total current liabilities	24,701	94,418
Long-term debt, net of deferred issuance costs	—	25,717
Long-term lease liabilities	344	864
Total liabilities	25,045	120,999
Commitments and contingencies		
Preferred stock: $0.01 par value; 10,000,000 shares authorized		
Series 1 redeemable convertible preferred stock, $0.01 par value, 1,517,500 shares authorized at December 31, 2020 and December 31, 2019, 452,000 shares issued and outstanding at December 31, 2020, 538,000 shares issued and outstanding at December 31, 2019	18,036	21,468
Stockholders' deficit:		
Common stock, $0.01 par value; 80,000,000 shares authorized at December 31, 2020 and December 31, 2019, respectively; 8,385,650 shares issued and 8,317,904 shares outstanding at December 31, 2020; 5,076,593 shares issued and 5,008,846 shares outstanding at December 31, 2019	84	507
Treasury stock: 67,746 shares held at December 31, 2020 and December 31, 2019	(5,056)	(5,056)
Additional paid-in capital	543,561	511,684
Accumulated other comprehensive loss	(339)	(327)
Accumulated deficit	(540,747)	(533,025)
Total stockholders' deficit	(2,497)	(26,217)
Total liabilities, preferred stock and stockholders' deficit	$ 40,584	$ 116,250

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

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

	Year Ended December 31,	
	2020	2019
Revenues		
Grants	$ —	$ 2,143
License fee revenue	500	5,000
Total revenues	500	7,143
Operating expenses		
Research and development	39,052	64,535
General and administrative	15,531	29,972
Total operating expenses	54,583	94,507
Other operating income (expense)		
Impairment of property and equipment	(1,265)	—
Gain on dispositions, net	3,656	—
Total other operating income	2,391	—
Loss from operations	(51,692)	(87,364)
Other income (expense):		
Interest income	387	1,351
Interest expense	(2,659)	(4,280)
Change in fair value of warrant and private placement option liabilities	46,130	(19,192)
Gain on extinguishment of debt	112	—
Other expense	—	(2,992)
Total other income (expense)	43,970	(25,113)
Net loss	$ (7,722)	$ (112,477)
Net loss per common share attributable to common shareholders, basic and diluted	$ (1.34)	$ (24.01)
Weighted-average shares outstanding-basic and diluted	5,760,159	4,684,711
Net loss	$ (7,722)	$ (112,477)
Other comprehensive loss:		
Unrealized gain on available-for-sale securities, net of tax	—	45
Foreign currency translation adjustment	(12)	(228)
Comprehensive loss	$ (7,734)	$ (112,660)

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

Bellicum Pharmaceuticals, Inc.
Consolidated Statements of Redeemable Convertible Preferred Stock and Stockholders' (Deficit) Equity
(amounts in thousands, except share data)

	Series 1 Preferred		Common Stock		Treasury Stock		Additional Paid-In Capital	Accumulated Deficit	Accumulated Other Comprehensive Loss	Total Stockholders' (Deficit) Equity
	Shares	Amount	Shares	Amount	Shares	Amount				
Balance, December 31, 2018	—	$ —	4,424,205	$ 442	(67,746)	$ (5,056)	493,784	$ (420,548)	$ (144)	$ 68,478
Share-based compensation	—	—	—	—	—	—	7,338	—	—	7,338
Exercise of stock options	—	—	2,985	—	—	—	76	—	—	76
Issuance of common stock - Employee Stock Purchase Plan	—	—	8,000	1	—	—	97	—	—	98
Issuance of common stock upon vesting of restricted stock units	—	—	12,287	1	—	—	(1)	—	—	—
Issuance of common stock in open market transactions, net of issuance costs	—	—	259,116	26	—	—	8,951	—	—	8,977
Issuance of redeemable convertible preferred stock in public offering, net	575,000	22,944	—	—	—	—	—	—	—	—
Conversion of redeemable convertible preferred stock into common stock	(37,000)	(1,476)	370,000	37	—	—	1,439	—	—	1,476
Comprehensive loss	—	—	—	—	—	—	—	(112,477)	(183)	(112,660)
Balance, December 31, 2019	538,000	$ 21,468	5,076,593	$ 507	(67,746)	$ (5,056)	$ 511,684	$ (533,025)	$ (327)	$ (26,217)
Share-based compensation	—	—	—	—	—	—	5,031	—	—	5,031
1-for-10 reverse stock split	—	—	—	(457)	—	—	457	—	—	—
Issuance of common stock - Employee Stock Purchase Plan	—	—	14,975	—	—	—	78	—	—	78
Issuance of common stock upon vesting of restricted stock units	—	—	1,406	—	—	—	—	—	—	—
Issuance of common stock and pre-funded warrants exercise, net of issuance costs	—	—	2,432,676	25	—	—	22,888	—	—	22,913
Conversion of redeemable convertible preferred stock into common stock	(86,000)	(3,432)	860,000	9	—	—	3,423	—	—	3,432
Comprehensive loss	—	—	—	—	—	—	—	(7,722)	(12)	(7,734)
Balance, December 31, 2020	452,000	$ 18,036	8,385,650	$ 84	(67,746)	$ (5,056)	$ 543,561	$ (540,747)	$ (339)	$ (2,497)

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

Bellicum Pharmaceuticals Inc.
Consolidated Statements of Cash Flows
(in thousands)

	Year Ended December 31,	
	2020	2019
Cash flows from operating activities:		
Net loss	$ (7,722)	$ (112,477)
Adjustments to reconcile net loss to net cash used in operating activities:		
Share-based compensation	5,031	7,338
Depreciation and amortization expense	1,472	7,175
Change in fair value of warrant and private placement option liabilities	(46,130)	19,192
Impairment of intangible assets	—	2,064
Amortization of discount on investment securities, net	—	(30)
Amortization of right-of-use assets	402	1,331
Accretion of lease liability	414	804
Impairment of property and equipment	1,265	—
Amortization of deferred issuance costs	550	885
Gain on extinguishment of debt	(112)	—
(Gain) loss on dispositions, net	(3,656)	6
Warrant and private placement option issuance costs	—	3,047
Changes in operating assets and liabilities:		
Accounts receivable, interest and other receivables	301	606
Prepaid expenses and other assets	563	(1,096)
Accounts payable	(1,917)	(1,131)
Accrued liabilities and other	(7,111)	(2,300)
Deferred revenue	—	(2,983)
Net cash used in operating activities	(56,650)	(77,569)
Cash flows from investing activities:		
Proceeds from sale of investment securities	—	49,379
Proceeds from sale of property and equipment	14,705	—
Purchases of property and equipment	(625)	(522)
Cash provided by investing activities	14,080	48,857
Cash flows from financing activities:		
Payment on debt	(37,155)	—
Proceeds from issuance of common stock in a public offering, net	—	8,977
Proceeds from issuance of redeemable convertible preferred stock in a public offering, net	—	22,944
Proceeds from issuance of warrants in a public offering, net	—	30,888
Proceeds received from private placement option, net	—	11,152
Proceeds from exercise of stock options	12	76
Proceeds from issuance of stock from employee stock purchase plan	78	98
Proceeds from issuance of common stock and pre-funded warrants exercise, net	22,901	—
Payment on financing lease obligations	(74)	(47)
Net cash (used in) provided by financing activities	(14,238)	74,088
Effect of exchange rate changes on cash	(12)	(228)
Net change in cash, cash equivalents and restricted cash	(56,820)	45,148
Cash, cash equivalents and restricted cash at beginning of period	93,816	48,668
Cash, cash equivalents and restricted cash at end of period	$ 36,996	$ 93,816
Supplemental cash flow information:		
Cash paid during the period for interest	$ 2,340	$ 3,201
Non-cash investing and financing activities:		
Financing leases incurred for equipment	$ —	$ 167
Conversion of redeemable preferred stock into common stock	$ 3,432	$ 1,476
Reclassification of property and equipment, net to assets held for sale	$ 2,300	$ 12,039
Leasehold improvements paid by landlord	$ 113	$ —

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

NOTE 1 - ORGANIZATION, BASIS OF PRESENTATION, AND SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Organization

Bellicum Pharmaceuticals, Inc. ("Bellicum") is a clinical stage biopharmaceutical company focused on discovering and developing novel cellular immunotherapies for various forms of cancer, including both hematological cancers and solid tumors. Bellicum is devoting substantially all of its present efforts to developing next-generation product candidates in areas of cellular immunotherapy, including CAR-T therapy.

Bellicum has two wholly-owned subsidiaries, Bellicum Pharma Limited, a private limited company organized under the laws of the United Kingdom, and Bellicum Pharma GmbH, a private limited liability company organized under German law. Both were formed for the purpose of developing product candidates in Europe. Bellicum, Bellicum Pharma Limited and Bellicum Pharma GmbH are collectively referred to herein as the "Company". All intercompany balances and transactions among the consolidated entities have been eliminated in consolidation.

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. The Company has determined that it has one operating and reporting segment as it allocates resources and assesses financial performance on a consolidated basis. The Company's chief operating decision maker is its Chief Executive Officer who manages operations and reviews the financial information as a single operating segment for purposes of allocating resources and evaluating its financial performance.

Reverse Stock Split

On February 5, 2020, the Company filed a Certificate of Amendment of the Amended and Restated Certificate of Incorporation with the Secretary of State of the State of Delaware to (i) effect a reverse stock split of all issued and outstanding shares of the Company's common stock at a ratio of 1-for-10 and (ii) reduce the number of authorized shares of the Company's common stock from 200,000,000 to 40,000,000. The accompanying consolidated financial statements and notes to the consolidated financial statements gives retroactive effect to the reverse stock split for all periods presented.

On June 15, 2020, the Company filed with the Secretary of State of the State of Delaware a Second Certificate of Amendment to the Company's Amended and Restated Certificate of Incorporation to increase the authorized number of shares of the Company's common stock from 40,000,000 shares to 80,000,000 shares.

Basis of Presentation

The accompanying financial statements have been prepared in conformity with the authoritative U.S. generally accepted accounting principles ("GAAP").

The accompanying financial statements have been prepared on a basis that assumes that the Company will continue as a going concern, and do not include any adjustments that may result from the outcome of this uncertainty. This basis of accounting contemplates the recovery of the Company's assets and the satisfaction of the Company's liabilities and commitments in the normal course of business and does not include any adjustments to reflect the possible future effects of the recoverability and classification of recorded asset amounts or amounts and classification of liabilities that might be necessary should the Company be unable to continue as a going concern. The Company has experienced net losses since its inception and if the Company does not successfully obtain regulatory approval and commercialize any of its product candidates, the Company will not be able to achieve profitability. As of December 31, 2020, the Company has an accumulated deficit of $540.7 million.

The Company is subject to risks common to companies in the biotechnology industry and the future success of the Company is dependent on its ability to successfully complete the development of, and obtain regulatory approval for, its product candidates, manage the growth of the organization, obtain additional financing necessary in order to develop, launch and commercialize its product candidates, and compete successfully with other companies in its industry.

The Company believes that its current capital resources, which consist of cash and cash equivalents, are sufficient to fund operations through at least the next twelve months from the date the accompanying financial statements are issued based on the expected cash burn rate. The Company may be required to raise additional capital to fund future operations through the sale of additional equity, incurrence of additional debt allowed under existing debt arrangements, the entry into licensing or collaboration agreements with partners, grants or other sources of financing. Sufficient funds may not be available to the Company at all or on attractive terms when needed from equity or debt financings. If the Company is unable to obtain additional funding from these or other sources when needed, or to the extent needed, it may be necessary to significantly reduce its controllable and variable expenditures and current rate of spending through reductions in staff and delaying, scaling back, or suspending certain research and development, sales and marketing programs and other operational goals.

Use of Estimates

The preparation of the financial statements in accordance with GAAP requires management to make certain estimates and judgments that affect the reported amounts of assets, liabilities, revenue recognition, and expenses. Actual results could differ materially from those estimates.

Revenue Recognition

The Company’s only source of revenue in 2020 was from its licensing agreement with The University of Texas MD Anderson Cancer Center, (“MD Anderson”). In 2019, the Company earned revenue from its licensing agreement with The University of Texas MD Anderson Cancer Center, (“MD Anderson”) and from grants. Prior to 2019, the Company's only source of revenue was from grants.

Grant Revenue

When grant funds are received after costs have been incurred, the Company records revenue and a corresponding grant receivable. Cash received from grants in advance of incurring qualifying costs is recorded as deferred revenue and recognized as revenue when qualifying costs are incurred.

License Revenue

The promised services in license agreements consist of license rights to the Company’s intellectual property. When management believes the license to its intellectual property and products has stand-alone value, the Company recognizes revenue attributed to the license upon delivery.

The Company recognizes revenue when control of the promised goods or services is transferred to its customers, in an amount that reflects the consideration to which the Company expects to be entitled in exchange for the goods or services. In order to achieve that core principle, a five-step approach is applied: (1) identify the contract with a customer, (2) identify the performance obligations in the contract, (3) determine the transaction price, (4) allocate the transaction price to the performance obligations in the contract, and (5) recognize revenue allocated to each performance obligation when the Company satisfies the performance obligation. A performance obligation is a promise in a contract to transfer a distinct good or service to the customer, and is the unit of account for revenue recognition.

The Company may provide options to additional items in the contracts, which are accounted for as separate contracts when the customer elects to exercise such options, unless the option provides a material right to the customer. The Company evaluates the customer options for material rights, or options to acquire additional goods or services for free or at a discount. If the customer options are determined to represent a material right, the material right is recognized as a separate performance obligation at the outset of the arrangement. Performance obligations are promised goods or services in a contract to transfer a distinct good or service to the customer and are considered distinct when (i) the customer can benefit from the good or service on its own or together with other readily available resources and (ii) the promised good or service is separately identifiable from other promises in the contract. In assessing whether promised goods or services are distinct, the Company considers factors such as the stage of development of the underlying intellectual property, the capabilities of the customer to develop the intellectual property on its own or whether the required expertise is readily available and whether the goods or services are integral or dependent to other goods or services in the contract.

License agreements generally include certain milestone payments. The Company utilizes the “most likely amount” method to estimate the amount of variable consideration, to predict the amount of consideration to which it will be entitled for its license agreement. Amounts of variable consideration are included in the transaction price to the extent that it is probable that a significant reversal in the amount of cumulative revenue recognized will not occur when the uncertainty associated with the variable consideration is subsequently resolved. Milestone, annual maintenance, and royalty payments that are not within the control of the Company or the licensee, such as those dependent upon receipt of regulatory approval, are not considered to be probable of achievement until the triggering event occurs. At the end of each reporting period, the Company reevaluates the probability of achievement of each 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, which would affect revenue and net loss in the period of adjustment. To date, the Company has not

recognized any development, regulatory or commercial milestones or royalty revenue resulting from its license agreement. Consideration that would be received for optional goods and/or services is excluded from the transaction price at contract inception.

License Agreement

On January 22, 2019, the Company entered into a licensing and commercialization agreement with MD Anderson (the "MD Anderson License Agreement"). Under the MD Anderson License Agreement, the Company granted MD Anderson non-exclusive rights in certain Caspase-9 and related technologies and use of a small molecule known as rimiducid.

During the fourth quarter of 2019, and under the terms of the MD Anderson License Agreement, MD Anderson exercised an option to grant a non-exclusive sublicense of the rights licensed by the Company to MD Anderson under the MD Anderson License Agreement. MD Anderson, as a result of this exercise, granted a sublicense that entitled the Company to receive as consideration an upfront payment of $5.0 million in license fees as well as additional future annual maintenance fees, milestone payments related to the achievement of pre-specified development, regulatory, and commercialization events, and royalties of two percent on net sales of licensed products.

During the fourth quarter of 2019, the Company recognized $5.0 million of license fee revenue as delivery of the license occurred and the license to its Caspase-9 intellectual property has stand-alone value. During 2020, the Company has received $0.5 million of maintenance fees under the MD Anderson License Agreement.

Cancer Research Grant Contract

On August 9, 2017, the Company entered into a Cancer Research Grant Contract (the “CPRIT Agreement”) with the Cancer Prevention Research Institute of Texas (“CPRIT”), pursuant to which CPRIT awarded a grant of approximately $16.9 million to the Company to fund development of rivo-cel for hematologic cancer (the “CPRIT Award”). The CPRIT Award is contingent upon funds being available during the term of the CPRIT Agreement and subject to CPRIT’s ability to perform its obligations under the CPRIT Agreement.

During 2017, the Company received $4.2 million in advance funding from CPRIT, which was recorded as deferred revenue. During the years ended December 31, 2020 and 2019, the Company incurred expenses and recognized revenue of $0.0 million and $2.1 million, respectively, for work performed under the CPRIT grant.

The CPRIT Agreement was due to expire on February 29, 2020, but was terminated early by the Company on January 31, 2020. Upon termination of the CPRIT Agreement, the Company reclassified the remaining unexpended award proceeds of $0.8 million from deferred revenue to accrued liabilities. During the year ended December 31, 2020, the Company returned the remaining unexpended award proceeds to CPRIT and released the accrued liability.

Cash, Cash Equivalents, and Restricted Cash

The Company considers all short-term, highly liquid investments with maturity of three months or less from the date of purchase and that can be liquidated without prior notice or penalty, to be cash equivalents.

The following table provides a reconciliation of cash, cash equivalents and restricted cash reported within the balance sheets that sum to the total of the same such amounts shown in the statements of cash flows.

(in thousands)	December 31, 2020	December 31, 2019
Cash and cash equivalents	$ 35,495	$ 91,028
Restricted cash	1,501	2,788
Total cash, cash equivalents and restricted cash shown in the statements of cash flows	$ 36,996	$ 93,816

In addition to the restricted cash held and released by CPRIT, there was $1.1 million of restricted cash as of December 31, 2019 in escrow to cover specific construction of manufacturing improvement costs related to the facility lease. The release of the funds was subject to the authorized completion of certain aspects of the manufacturing improvements. The funds were released during year ended December 31, 2020.

In connection with the closing of the Asset Purchase Agreement with M.D. Anderson on April 14, 2020, $1.5 million of the cash proceeds received are subject to certain escrow provisions and recorded as restricted cash. The funds are required to be held for a period of up to 18 months subsequent to the April 14, 2020 closing date.

Dispositions and Derecognition of Liabilities

Disposition of Assets and Liabilities Held for Sale

In 2019, the Company completed the buildout of manufacturing space at its leased headquarters in Houston, Texas and began in-house clinical supply manufacturing. The facility included capacity in excess of the Company's anticipated current and near-term manufacturing needs and management decided to seek a partner for the facility with the goal of reducing the Company's costs while maintaining dedicated cell therapy manufacturing capacity to support the Company's product candidates.

The disposal of the assets and liabilities of such facility was completed on April 14, 2020, at a purchase price of $15.0 million. The disposal group consisted of property and equipment, net of $12.0 million, right-of-use assets of $4.8 million, current portion of lease liabilities of $1.4 million and long-term lease liabilities of $4.6 million. During the year ended December 31, 2020, the Company recognized a net gain of $3.8 million in connection with the disposal, which is presented within Gain on dispositions, net within the accompanying consolidated statements of operations and comprehensive loss.

Investment Securities

Consistent with its investment policy, the Company invests its cash allocated to fund its short-term liquidity requirements with prominent financial institutions in bank depository accounts and institutional money market funds. The Company invests the remainder of its cash in corporate debt securities and municipal bonds rated at least A quality or equivalent, U.S. Treasury notes and bonds and U.S. and state government agency-backed securities.

The Company determines the appropriate classification of investment securities based on whether they represent the investment of funds available for current operations. The Company reevaluates its classification as of each balance sheet date. All investment securities owned are classified as available-for-sale. The cost of securities sold is based on the specific identification method. Investment securities are recorded as of each balance sheet date at fair value based on quoted prices in active markets, with unrealized gains and, to the extent deemed temporary, unrealized losses reported as accumulated other comprehensive gain (loss), a separate component of stockholders' (deficit) equity. Interest and dividend income on investment securities, accretion of discounts and amortization of premiums and realized gains and losses are included in interest income in the statements of operations and comprehensive loss.

An investment security is considered to be impaired when a decline in fair value below its cost basis is determined to be other than temporary. The Company evaluates whether a decline in fair value of an investment security is below its cost basis is other than temporary using available evidence. In the event that the cost basis of the investment security exceeds its fair value, the Company evaluates, among other factors, the amount and duration of the period that the fair value is less than the cost basis, the financial health of and business outlook for the issuer, including industry and sector performance, and operational and financing cash flow factors, overall market conditions and trends, the Company’s intent to sell the investment security and whether it is more likely than not the Company would be required to sell the investment security before its anticipated recovery. If a decline in fair value is determined to be other than temporary, the Company records an impairment charge in the statement of operations and comprehensive loss and establishes a new cost basis in the investment. To date, the Company has not identified any other than temporary declines in the fair value of its investment securities.

Assets Held for Sale

In the fourth quarter of 2020, in connection with the Company's restructuring plan, Management elected to seek an exit to its leased R&D facility in Houston, Texas. As a result of this decision, the Company reclassified the assets and liabilities associated with the leased facility as held for sale. The reclassified assets and liabilities included a right-of-use asset of $0.5 million, property and equipment of $2.3 million and the related lease liability of $0.7 million. Based on the cost to exit the lease and the net realizable value of the related assets the Company recognized an impairment charge of $1.3 million in 2020.

Property and Equipment

Furniture, equipment and software are recorded at cost and are depreciated using the straight-line method over the estimated useful lives of the related assets, which range from 3 to 5 years. Leasehold improvements are amortized over the shorter of the estimated useful life or the remaining lease term.

Property and equipment consisted of the following:

(in thousands, except useful lives)	Estimated Useful Lives	December 31, 2020	December 31, 2019
Leasehold improvements	5 Years	$ 167	$ 3,944
Lab equipment	5 Years	530	5,459
Office furniture	5 Years	—	392
Manufacturing equipment	5 Years	138	395
Computer and office equipment	3 to 5 Years	834	1,595
Equipment held under capital leases	5 Years	—	270
Software	3 Years	94	385
Total		1,763	12,440
Less: accumulated depreciation		(1,574)	(9,911)
Property and equipment, net		$ 189	$ 2,529

During the years ended December 31, 2020 and 2019, the Company recorded $1.5 million and $7.0 million of depreciation expense, respectively.

Intangible Assets

Non-refundable upfront payments related to a supply agreement with future benefits have been capitalized as an intangible asset, presented in other assets on the accompanying consolidated balance sheets and amortized over the term of the agreement. The amortization of the intangible asset is included in operating expenses in the accompanying consolidated statements of operations and comprehensive loss.

During the fourth quarter of 2019, the Company recorded $2.1 million of impairment charges related to the non-refundable upfront payments for the Miltenyi supply agreement that had been capitalized as an intangible asset. The Company recorded the impairment charge as a “Research and development” operating expense within the accompanying consolidated statements of operations and comprehensive loss. There were no other impairment charges related to long-lived assets for the years ended December 31, 2020 and 2019.

Impairment of Long-Lived Assets

The Company reviews long-lived assets for impairment when events or changes in business conditions indicate that their carrying value may not be recoverable. Recoverability of assets to be held and used is measured by a comparison of the carrying amount of an asset to the estimated undiscounted future cash flows expected to be generated by the asset. If the carrying amount of an asset exceeds its estimated future cash flows, an impairment charge is recognized in the amount by which the carrying amount of the asset exceeds the fair value of the asset.

Accrued Expenses and Other Current Liabilities

Accrued expenses and other liabilities consist of the following:

	December 31, 2020	December 31, 2019
Accrued payroll	$ 1,029	$ 2,032
Accrued patient treatment costs	899	1,162
Accrued manufacturing costs	24	2,230
Accrued professional services	294	654
Accrued obligations under material supply agreements	—	1,121
Accrued other	1,919	2,571
Total accrued expenses and other current liabilities	$ 4,165	$ 9,770

Debt Issuance Costs

Costs related to debt issuance are presented in the accompanying consolidated balance sheets as a direct deduction from the carrying amount of the debt liability, consistent with debt discounts and are amortized using the effective interest method. Amortization of debt issuance costs are included in interest expense in the accompanying statements of operations and comprehensive loss.

Warrant Derivatives

Freestanding warrants exercisable for multiple underlying instruments are classified as liabilities in the accompanying consolidated balance sheets. The Company accounts for these warrants at fair value on the date of issuance and are subject to re-measurement to fair value at each balance sheet date. Any change in fair value is recognized as a component of other income (expense) on the accompanying consolidated statements of operations and comprehensive loss. The Company estimates the fair value of these liabilities using the binomial option model, adjusted for the effect of dilution, because it embodies all of the requisite assumptions (including trading volatility, estimated terms, dilution and risk-free rates) necessary to determine the fair value of this instrument. The Company will continue to adjust the liability for changes in fair value until the earlier of the exercise or expiration of the warrants or a change in control, as defined. The warrants are freely exercisable at any time from the issuance date until the expiration date, provided exercise does not cause a warrant holder to exceed a pre-determined beneficial ownership limit.

The Company estimates the fair value of these liabilities using the Black-Scholes valuation technique, which utilizes assumptions including (i) the fair value of the underlying stock at the valuation measurement date, (ii) volatility of the price of the underlying stock, (iii) the expected term, and (iv) risk-free interest rates.

Private Placement Option

The Company has entered into a security purchase agreement that contains a call option on preferred shares that are puttable outside the control of the Company. The Company recorded the option as a liability and measured the fair value of the option at the time of issuance. The Company will re-measure the option to fair value at each balance sheet date and record changes in fair value in other income (expense) in the accompanying consolidated statement of operations and comprehensive loss at each reporting period. Offering expenses arising from the issuance of the private placement option were expensed as incurred.

The Company estimates the fair value of these liabilities using a binomial lattice model, which utilizes assumptions including (i) the fair value of the underlying stock at the valuation measurement date, (ii) volatility of the price of the underlying stock, (iii) the expected term, and (iv) risk-free interest rates.

Preferred Stock

Preferred shares issued by the Company that are subject to mandatory redemption are classified as liability instruments in the accompanying consolidated balance sheets and are measured at fair value at the date of issuance. Conditionally redeemable preferred shares (including preferred shares that feature redemption rights that are either within the control of the holder or subject to redemption upon the occurrence of uncertain events not solely within the Company’s control) are classified within mezzanine equity in the accompanying consolidated balance sheets. At all other times, preferred shares are classified within stockholders’ (deficit) equity.

Operating Leases

At the inception of a contractual arrangement, the Company determines whether the contract contains a lease by assessing whether there is an identified asset and whether the contract conveys the right to control the use of the identified asset in exchange for consideration over a period of time. If both criteria are met, upon lease commencement, the Company records a lease liability which represents the Company’s obligation to make lease payments arising from the lease, and a corresponding right-of-use (“ROU”) asset which represents the Company’s right to use an underlying asset during the lease term.

Operating leases are recognized as right-of-use, or ROU, assets and operating lease liabilities on the balance sheet based on the present value of the future minimum lease payments over the lease term at commencement date calculated using the Company's incremental borrowing rate applicable to the underlying asset unless the implicit rate is readily determinable. Any lease incentives received are deferred and recorded as a reduction of the ROU asset and amortized over the term of the lease. Rent expense, comprised of amortization of the ROU asset and the implicit interest accreted on the operating lease liability, is recognized on a straight-line basis over the lease term. The Company determines the lease term as the noncancellable period of the lease and may include options to extend or terminate the lease when it is reasonably certain that the Company will exercise such options. Leases with a term of 12 months or less are not recognized on the balance sheets.

Fair Value of Financial Instruments

Fair value is defined as the exchange price that would be received for an asset or an exit price paid to transfer a liability in an orderly transaction between market participants in a principal market on the measurement date.

Accounting standards include disclosure requirements around fair values used for certain financial instruments and establish a fair value hierarchy. The three-tier hierarchy defines a three-tiered valuation hierarchy for disclosures that prioritizes valuation inputs into three levels based on the extent to which inputs used in measuring fair value are observable in the market, as described further in Note 2.

Observable inputs reflect readily obtainable data from independent sources, and unobservable inputs reflect the Company's market assumptions.

These inputs are classified into the following hierarchy:

Level 1 Inputs - quoted prices (unadjusted) in active markets for identical assets that the reporting entity has the ability to access at the measurement date;

Level 2 Inputs - inputs other than quoted prices included within Level 1 that are observable for the asset, either directly or indirectly; and

Level 3 Inputs - unobservable inputs for the assets.

The categorization of a financial instrument within the valuation hierarchy is based upon the lowest level of input that is significant to the fair value measurement.

The Company believes the recorded values of its financial instruments, including cash and cash equivalents, accounts payable, accrued liabilities, and debt approximate their fair values due to the short-term nature of these instruments.

Financial Instruments and Credit Risks

Financial instruments that potentially subject the Company to credit risk include cash and cash equivalents and accounts receivable. Cash is deposited in demand accounts in federally insured domestic institutions to minimize risk. Insurance is provided through the Federal Deposit Insurance Corporation and Security Investor Protection Corporation. Although the balances in these accounts exceed the federally insured limit from time to time, the Company has not incurred losses related to these deposits.

Equity Issuance Costs

Equity issuance costs represent costs paid to third parties in order to obtain equity financing. These costs have been netted against the proceeds of the equity issuances.

Licenses and Patents

Licenses and patent costs for technologies that are utilized in research and development and have no alternative future use are expensed as incurred. Costs related to the license of patents from third parties and internally developed patents are classified as research and development expenses. Legal costs related to patent applications and maintenance are classified as general and administrative expenses in the accompanying consolidated statements of operations and comprehensive loss.

Research and Development

Research and development expenses consist of expenses incurred in performing research and development activities, including compensation and benefits for research and development employees and consultants, facilities expenses, overhead expenses, cost of laboratory supplies, manufacturing expenses, fees paid to third parties and other outside expenses.

Research and development costs are expensed as incurred. Clinical trial and other development costs incurred by third parties are expensed as the contracted work is performed. The Company accrues for costs incurred as the services are being provided by monitoring the status of the clinical trial or project and the invoices received from its external service providers. The Company estimates depend on the timeliness and accuracy of the data provided by the vendors regarding the status of each project and total project spending. The Company adjusts its accrual as actual costs become known. Where contingent milestone payments are due to third parties under research and development arrangements, the milestone payment obligations are expensed when the milestone events are achieved.

Collaboration Agreements

The Company enters into collaboration agreements that include varying arrangements regarding which parties perform and bear the costs of research and development activities. The Company may share the costs of research and development activities with a collaborator, or the Company may be reimbursed for all or a significant portion of the costs of the Company's research and development activities. The Company records its internal and third-party development costs associated with these collaborations as research and development expenses. When the Company is entitled to reimbursement of all or a portion of the research and development expenses that it incurs under a collaboration, the Company records those reimbursable amounts as a deduction to the research and development expenses. If the collaboration is a cost-sharing arrangement in which both the Company and its collaborator perform development work and share costs, the Company also recognizes, as research and development expenses in the period when its collaborator incurs development expenses, the portion of the collaborator's development expenses that the Company is obligated to reimburse.

Contract Manufacturing Services

Contract manufacturing services are expensed as incurred. Prepaid expenses are capitalized and amortized as services are performed.

Share-Based Compensation

The Company accounts for share-based compensation based on the measurement and recognition of compensation expense for all share-based payment awards made to employees, directors and consultants to be recognized in the financial statements, based on their fair value.

The Company calculates the fair value of stock options on the date of grant using the Black-Scholes pricing model, which requires a number of estimates, including the expected life of awards, interest rates, stock volatility and other assumptions. Restricted stock is measured based on the fair market value of the underlying stock on the date of grant. If the awards are classified as liability awards, the fair value is remeasured at each reporting date and the compensation expense is adjusted accordingly. Additionally, the Company applies a forfeiture rate to estimate the number of grants that will ultimately vest, as applicable, and adjust the expense as these awards vest. All of the Company's current equity awards are service based awards and the share-based compensation cost is being recognized over the requisite service period of the awards on a straight-line basis.

Income Taxes

Income taxes are accounted for under the asset and liability method. Deferred tax assets and liabilities are recognized for the future tax consequences attributable to differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax bases. This method also requires the recognition of future tax benefits such as net operating loss and tax credit carry forwards, to the extent that realization of such benefits is more likely than not. A valuation allowance is recorded when the realization of future tax benefits is uncertain. The Company records a valuation allowance for the full amount of deferred tax assets, which would otherwise be recorded for tax benefits relating to the operating loss and tax credit carryforwards, as realization of such deferred tax assets cannot be determined to be more likely than not.

Deferred tax assets and liabilities are measured using enacted tax rates expected to apply to taxable income in the years in which those temporary differences are expected to be recovered or settled. The effect on deferred tax assets and liabilities of a change in tax rates is recognized in the statement of operations in the period that includes the enactment date.

As of December 31, 2020, the Company had recorded a full valuation allowance on its net U.S. and foreign deferred tax assets because the Company expects that it is more likely than not that its deferred tax assets will not be realized in the foreseeable future. Should the actual amounts differ from our estimates, the amount of the valuation allowance could be materially impacted.

The Company accounts for uncertain tax positions in accordance with the provisions of the Accounting Standards Codification (ASC) 740, *Income Taxes*. When uncertain tax positions exist, the Company recognizes the tax benefit of tax positions to the extent that the benefit will more likely than not be realized. The determination as to whether the tax benefit will more likely than not be realized is based upon the technical merits of the tax position as well as consideration of the available facts and circumstances. As of December 31, 2020 and 2019, the Company had no uncertain tax positions and no interest or penalties have been charged for the years ended December 31, 2020 and 2019. The Company is subject to routine audits by taxing jurisdictions; however, there are currently no audits for any tax periods in progress. The tax years 2005 through 2020 remain open to examination by the U.S. Internal Revenue Service.

Comprehensive Loss

Comprehensive loss is defined as the change in equity of a business enterprise during a period, from transactions, and other events and circumstances from non-owner sources. Components of other comprehensive loss includes, among other items, unrealized gains and losses on the changes in fair value of investments and unrealized gains and losses on the change in foreign currency exchange rates. These components are added, net of their related tax effect, to the reported net loss to arrive at comprehensive loss.

Net Loss and Net Loss per Share of Common Stock Attributable to Common Stockholders

Basic net loss per share attributable to common stockholders is calculated by dividing the net loss attributable to common stockholders by the weighted-average number of shares of common stock outstanding during the period without consideration for common stock equivalents. Diluted earnings per share is based on the treasury stock method and includes the effect from potential issuance of ordinary shares, such as shares issuable pursuant to the conversion of preferred stock to common stock, exercise of warrants to purchase common stock, exercise of stock options, and vesting of restricted stock units.

The following outstanding shares of common stock equivalents were excluded from the computations of diluted net loss per shares of common stock attributable to common stockholders for the periods presented as the effect of including such securities would be anti-dilutive.

	December 31, 2020	December 31, 2019
Common stock equivalents:	Number of Shares	
Redeemable convertible series 1 preferred stock	4,520,000	5,380,000
Warrants to purchase common stock	11,616,080	5,750,000
Private placement option	9,675,000	—
Options to purchase common stock	1,510,968	567,842
Unvested shares of restricted stock units	129,861	6,359
Total common stock equivalents	27,451,909	11,704,201

New Accounting Requirements and Disclosures

Fair Value Measurement

In August 2018, the FASB issued ASU No. 2018-13, *Fair Value Measurement (Topic 820): Disclosure Framework—Changes to the Disclosure Requirements for Fair Value Measurement*, which modifies fair value disclosures and removes some disclosure requirements for both public and private companies. In addition, public companies are subject to some new disclosure requirements which requires to disclose the changes in unrealized gains and losses for the period included in other comprehensive income for recurring Level 3 fair value measurements held at the end of the reporting period and the range and weighted average of significant unobservable inputs used to develop Level 3 fair value measurements. ASU No. 2018-13 is effective for all entities for fiscal years, and interim periods within those fiscal years, beginning after December 15, 2019. Early adoption is permitted. The Company does not expect the adoption of this standard to have a material effect on its financial statements.

Financial Instruments – Credit Losses

In June 2016, the FASB issued ASU No. 2016-13, *Financial Instruments — Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments*, which requires the measurement of all expected credit losses for financial assets including trade receivables held at the reporting date based on historical experience, current conditions, and reasonable and supportable forecasts. ASU No. 2016-13 is effective for fiscal years, and interim periods within those fiscal years, beginning after December 15, 2019. The Company adopted the standard effective January 1, 2020 with no material effect on its financial statements. Subsequent to the issuance of ASU 2016-13, the FASB issued ASU 2018-19, Codification Improvements to Topic 326, Financial Instruments - Credit Losses. This ASU does not change the core principle of the guidance in ASU 2016-13, instead these amendments are intended to clarify and improve operability of certain topics included within the credit losses guidance. The FASB also subsequently issued ASU No. 2019-04, Codification Improvements to Topic 326, Financial Instruments—Credit Losses, Derivatives and Hedging (Topic 815), and Financial Instruments (Topic 842), which did not change the core principle of the guidance in ASU 2016-13 but clarified that expected recoveries of amounts previously written off and expected to be written off should be included in the valuation account and should not exceed amounts previously written off and expected to be written off. The guidance is effective for fiscal years, and interim periods within those years, beginning after December 15, 2019 for public business entities, excluding smaller reporting companies. Early adoption is permitted. As a smaller reporting company, the guidance will be effective for the Company during the first quarter of 2023. The Company is in the process of assessing the impact adoption will have on its consolidated financial statements.

Income Taxes

In December 2019, the FASB issued ASU No. 2019-12, Simplifying the Accounting for Income Taxes (Topic 740). The guidance eliminates certain exceptions for recognizing deferred taxes for investments, performing intraperiod allocation and calculating income taxes in interim periods. This guidance also includes guidance to reduce complexity in certain areas, including recognizing deferred taxes for tax goodwill and allocating taxes to members of a consolidated group. ASU 2019-12 is effective for annual and interim periods in fiscal years beginning after December 15, 2020. Early adoption is permitted. The Company is currently evaluating the impact this change will have on its consolidated financial statements.

Investments

In January 2020, the FASB issued Accounting Standards Update No. 2020-01, Investments—Equity Securities (Topic 321), Investments—Equity Method and Joint Ventures (Topic 323), and Derivatives and Hedging (Topic 815)—Clarifying the Interactions between Topic 321, Topic 323, and Topic 815 (a consensus of the Emerging Issues Task Force), which clarifies the interaction of the accounting for equity securities, investments accounted for under the equity method, and certain forward contracts and purchased options. This update is effective for fiscal years beginning after December 15, 2020, and interim periods within those fiscal years, and early adoption is permitted. The Company is in the process of determining the impact the adoption will have on its consolidated financial statements as well as whether to early adopt the new guidance.

NOTE 2 - FAIR VALUE OF MEASUREMENTS AND INVESTMENT SECURITIES

Investment Securities

The following tables present the Company's investment securities (including those classified on the Company's balance sheet as cash equivalents) that are measured at fair value on a recurring basis as of December 31, 2020 and 2019:

	Fair Value at December 31, 2020			Fair Value at December 31, 2019		
(in thousands)	Level 1	Level 2	Level 3	Level 1	Level 2	Level 3
Cash Equivalents:						
Money market funds and treasury bills	$ 27,463	$ —	$ —	$ 77,170	$ —	$ —
Total Cash Equivalents	$ 27,463	$ —	$ —	$ 77,170	$ —	$ —

As of December 31, 2020, the $1.5 million of restricted cash, on the Company's balance sheet is held in a money market fund.

Money market funds, U.S. Treasury, U.S. government agency-backed securities, corporate debt securities and municipal bonds are valued based on various observable inputs such as benchmark yields, reported trades, broker/dealer quotes, benchmark securities and bids.

Warrant Derivative Liability and Private Placement Option Liability

The Company's financial liabilities recorded at fair value on a recurring basis include the fair values of the warrant derivative liability and the private placement option liability. As of December 31, 2020, the fair values of the warrant derivative liability and the private placement option liability are classified as current liabilities in the accompanying consolidated balance sheets. These liabilities will be shown as current liabilities on the balance sheet when it is deemed more probable than not by management to be exercised within one year.

Inputs used to determine estimated fair value (Level 3) of the warrants include the fair value of the underlying stock relative to the warrant exercise price at the valuation measurement date, volatility of the price of the underlying stock, the expected term of the warrants, and risk-free interest rates.

The fair value of the warrants has been estimated with the following weighted-average assumptions, including the most sensitive input, volatility:

	December 31, 2020	December 31, 2019
Risk-free interest rate	0.46 %	1.83 %
Volatility	90 %	78.67 %
Expected life (years)	5.64	6.64

The fair value of the private placement option has been estimated with the following weighted-average assumptions, including the most sensitive input, volatility:

	December 31, 2020
Risk-free interest rate	0.77%
Volatility of underlying stock price	90.00%
Expected term (years)	7.00

The following table provides the warrant derivative and private placement option liabilities reported at fair value and measured on a recurring basis:

	Fair Value at December 31, 2020			Fair Value at December 31, 2019		
(in thousands)	Level 1	Level 2	Level 3	Level 1	Level 2	Level 3
Warrant derivative liability	$ —	$ —	$ 10,345	$ —	$ —	$ 52,184
Private placement option liability	—	—	7,803	—	—	12,094
Total fair value	$ —	$ —	$ 18,148	$ —	$ —	$ 64,278

The ending balance of the Level 3 financial instruments presented above represents our best estimate of valuation and may not be substantiated by comparison to independent markets and, in many cases, could not be realized in immediate settlement of the instruments.

NOTE 3 - LEASES

The Company determines whether an arrangement is a lease at its inception. Operating leases relate primarily to office space and manufacturing facilities with remaining lease terms of two to three years. If operating leases include options to extend the lease term, management will consider the options in determining the lease term used to establish the Company's ROU assets and lease liabilities.

The Company entered into a lease agreement for office and laboratory space in Houston, Texas commencing in July 2020 and expiring in 2023. The Company recorded ROU assets of $0.5 million and a corresponding lease liability of $0.6 million upon lease commencement.

In October 2020, in connection with the Company's restructuring plan, Management elected to seek an exit to its leased office and laboratory space in Houston, Texas. As a result of this decision, the Company reclassified the assets and liabilities associated with the leased facility as held for sale. The reclassified assets included a right-of-use asset of $0.5 million, property and equipment of $2.3 million, and related lease liability of $0.7 million. Based on the cost to exit the lease and the net realizable value of the related assets the Company recognized an impairment charge of $1.3 million in 2020.

As most of the Company's leases do not provide an implicit rate, the Company's incremental borrowing rate is based on the information available at lease commencement date and was used to determine the present value of lease payments. Components of lease cost are as follows:

(in thousands)	Year Ended December 31, 2020	Year Ended December 31, 2019
Finance lease cost:		
Amortization of leased assets	$ 74	$ 61
Interest on lease liabilities	21	25
Operating lease cost	814	2,135
Short-term lease cost	582	296
Total lease cost	$ 1,491	$ 2,517
Weighted-average remaining lease term:		
Operating leases	1.7 years	5.2 years
Finance leases	1.4 years	2.4 years
Weighted-average discount rate:		
Operating leases	11.47 %	12.10 %
Finance leases	13.05 %	13.40 %

Supplemental cash flow information and non-cash activity related to the Company's operating and finance leases are as follows:

(in thousands)	Year Ended December 31, 2020	Year Ended December 31, 2019
Cash paid for amounts included in the measurement of lease liabilities:		
Operating cash flows from operating leases	$ 950	$ 2,378
Operating cash flows from finance leases	21	25
Financing cash flows from finance leases	74	47
Non-cash activity:		
Right-of-use assets obtained in exchange for lease obligations	$ —	$ 2,263

Maturities of lease liabilities by year for leases are as follows:

(in thousands)	Operating Leases	Financing Leases
2021	$ 499	$ 90
2022	306	39
2023	14	—
Total lease payments	819	129
Less: Imputed interest	(79)	(12)
Present value of lease liabilities	$ 740	$ 117

NOTE 4 - DEBT

Oxford Loan

On December 21, 2017 (the “Oxford Closing Date”), the Company entered into a loan and security agreement (the “Oxford Loan Agreement”) with Oxford Finance LLC, as the collateral agent and the lenders listed on Schedule 1.1 thereto or otherwise party thereto from time to time (the "Lenders"), pursuant to which the Company borrowed $35.0 million in a single term loan (the “Oxford Loan”) on the Oxford Closing Date. On the Oxford Closing Date, the Company used approximately $32.9 million of the proceeds from the Oxford Loan to repay its indebtedness to a previous lender.

On December 24, 2019, the Company entered into a First Amendment to Loan and Security Agreement (the “First Amendment”) with Oxford, in connection with the Asset Sale with M.D. Anderson. On March 31, 2020, the Company entered into a Second Amendment to Loan and Security Agreement (the "Second Amendment") with Oxford Finance LLC, in connection with the Asset Sale. The loan and security agreement with Oxford, as amended by the First and Second Amendment, is referred to as the "Oxford Loan Agreement."

The Company’s obligations under the Oxford Loan Agreement were secured by a first priority security interest in substantially all of the Company’s current and future assets, including its intellectual property. The Company also agreed not to encumber its intellectual property assets, except as permitted by the Oxford Loan Agreement. The Oxford Loan originally matured on December 1, 2022 (the “Oxford Maturity Date”) and was originally interest-only through January 31, 2020, followed by 35 equal monthly payments of principal and unpaid accrued interest. The Oxford Loan bore interest at a floating per annum rate equal to (i) 7.25% plus (ii) the greater of (a) the 30-day U.S. Dollar LIBOR rate reported in The Wall Street Journal on the last business day of the month that immediately precedes the month in which the interest will accrue and (b) 1.25%.

Pursuant to the Second Amendment, the Loan Agreement was amended to, among other things: (i) provide for Oxford's and the Lenders’ consent to the Company’s consummation of the Asset Sale with M.D. Anderson, provided such sale occurs on or prior to June 30, 2020; (ii) if such Asset Sale occurs on or prior to June 30, 2020, extend the interest-only period through as late as July 31, 2021; (iii) if Asset Sale closes on or prior to June 30, 2020, provide for a partial repayment to the Lenders of a significant percentage of the proceeds of the asset sale that varies in accordance with the timing of closing and the associated amortization schedule, a portion of which will be applied as partial payment of the Final Payment Percentage (as defined in the Loan Agreement); and (iv) grant the Lenders and Oxford a security interest in the Company’s intellectual property as of the date of the Second Amendment, in each case as set forth in the Second Amendment. The sale of certain assets subject to the Second Amendment closed on April 14, 2020. Pursuant to the Second Amendment, the closing of the Asset Sale to M.D. Anderson triggered the Company’s obligation to provide partial repayment to the Lenders of $7.0 million, of which $0.6 million was applied as partial payment of the Oxford Final Payment Fee. The interest-only period was extended through December 31, 2020.

The Company paid expenses related to the Oxford Loan Agreement of $0.1 million, which, along with the final facility charge of $3.0 million, were recorded as deferred issuance costs, which offset long-term debt on the Company's consolidated balance sheet. The deferred issuance costs were being amortized over the term of the loan as interest expense using the effective interest method. During the years ended December 31, 2020 and 2019, interest expense of amortized deferred issuance costs included $0.6 million and $0.9 million, respectively.

During November 2020, the Company entered into an agreement for the early settlement of all debt obligations under the Oxford Loan Agreement. During the same month, the Company remitted payment of $27.4 million, which included full repayment of the outstanding principal balance, the Oxford Final Payment Fee, and accrued interest. The Company recorded a gain on extinguishment of $0.1 million in the accompanying statements of operations and comprehensive loss.

NOTE 5 - PUBLIC OFFERING AND PRIVATE PLACEMENT

November 2020 Underwritten Offering

In November 2020, the Company closed an underwritten offering of 1,040,000 shares of its common stock, pre-funded warrants to purchase 3,109,378 shares of its common stock, and accompanying common warrants to purchase up to an aggregate of 4,149,378 shares of its common stock. Each share of common stock and pre-funded warrant to purchase one share of common stock was sold together with a common warrant to purchase one share of common stock. The public offering price of each share of common stock and accompanying common warrant was $6.025 and $6.024 for each pre-funded warrant. The pre-funded warrants were immediately exercisable at a price of $0.001 per share of common stock. The common warrants were immediately exercisable at an exercise price of $6.50 per share of common stock and will expire five years from the date of issuance. The shares of common stock and pre-funded warrants, and the accompanying common warrants, were issued separately and were immediately separable upon issuance. The gross proceeds to the Company were approximately $25.0 million before deducting underwriting discounts and commissions and other offering expenses.

August 2019 Public Offering

On August 16, 2019, the Company entered into an underwriting agreement (the "Underwriting Agreement") with Jefferies LLC and Wells Fargo Securities, LLC, as representatives of the several underwriters named therein (the "Underwriters"), relating to an underwritten public offering (the "Offering") of 575,000 shares of the Series 1 Redeemable Convertible Non-Voting Preferred Stock of the Company (the "Series 1 Preferred Stock") and warrants (the "Public Warrants") to purchase up to 5,750,000 shares of its common stock. Each share of Series 1 Preferred Stock was being sold together with a warrant to purchase 10 shares of common stock at a combined price to the public of $100.00. Under certain circumstances, each warrant to purchase 10 shares of common stock will be exercisable, at the irrevocable election of the holder, for one share of Series 1 Preferred Stock. The offering closed on August 21, 2019, and the net proceeds to the Company from the Offering was approximately $53.8 million, after deducting underwriting discounts and commissions and offering expenses payable by the Company, and excluding any proceeds that the Company may receive upon exercise of the Public Warrants.

All of the Public Warrants sold in the Offering have an exercise price of $13.00 per share of common stock or, in certain circumstances, for $130.00 per share of Series 1 Preferred Stock, subject to proportional adjustments in the event of stock splits or combinations or similar events. The Public Warrants were immediately exercisable upon issuance, provided that the holder is prohibited, subject to certain exceptions, from exercising a warrant for shares of common stock to the extent that immediately prior to or after giving effect to such exercise, the holder, together with its affiliates and other attribution parties, would own more than 9.99% of the total number of shares of common stock then issued and outstanding, which percentage may be changed at the holder's election to a lower percentage at any time or to a higher percentage not to exceed 19.99% upon 61 days' notice to the Company. The Public Warrants will expire on August 21, 2026, unless exercised prior to that date.

Private Placement

On August 16, 2019, the Company entered into a securities purchase agreement (the "Securities Purchase Agreement") with certain institutional investors named therein (the "Purchasers"), pursuant to which the Company agreed to issue in a private placement (i) 350,000 shares of its Series 2 Redeemable Convertible Non-Voting Preferred Stock (the "Series 2 Preferred Stock"), at a purchase price of $100.00 per share, and related warrants (the "Private Warrants") to purchase up to 2,800,000 shares of common stock at an exercise price of $10.00 per share, and (ii) 250,000 shares of its Series 3 Redeemable Convertible Non-Voting Preferred Stock (the "Series 3 Preferred Stock" and, together with the Series 1 Preferred Stock and Series 2 Preferred Stock, the "Preferred Stock"), at a purchase price of $140.00 per share, and related warrants (also, "Private Warrants") to purchase up to 875,000 shares of common stock at an exercise price of $14.00 per share. The purchase and sale of the securities issuable under the private placement agreement may occur in two or more separate closings, each to be conducted at the Purchasers' discretion within five days' notice to the Company. The purchase and sale was subject to the Company's obtaining stockholder approval for additional authorized shares of Common Stock or a reverse stock split (the "Required Stockholder Approval"), which occurred in the first quarter of 2020. The right of the Purchasers to purchase such securities will expire two and a half years after the Required Stockholder Approval, on June 15, 2022, with respect to the Series 2 Preferred Stock, and three years after such stockholder approval, on January 15, 2023, with respect to the Series 3 Preferred Stock, if not exercised prior to that date.

The Company received $11.2 million in net option fee proceeds, net of offering costs, upon the execution of the Securities Purchase Agreement. Total offering costs incurred by the Company related to the Public Warrants, Private Warrants and options amounted to $3.0 million.

The following table reflects the fair value roll forward reconciliation of the warrant derivative and private placement option liabilities for the period ended December 31, 2020:

(in thousands)	Warrant Derivative Liability	Private Placement Option Liability	Total
Balance, December 31, 2019	$ 52,184	$ 12,094	$ 64,278
Change in fair value	(41,839)	(4,291)	(46,130)
Balance, December 31, 2020	$ 10,345	$ 7,803	$ 18,148

NOTE 6 - REDEEMABLE CONVERTIBLE PREFERRED STOCK

In August 2019, the Company sold Series 1 Preferred Stock pursuant to the Offering. The Company has 10,000,000 authorized shares of preferred stock with a par value of $0.01, of which the Company has designated 1,517,500 shares as Series 1 redeemable convertible non-voting preferred stock, 350,000 shares as Series 2 redeemable convertible non-voting preferred stock and 250,000 shares as Series 3 redeemable convertible non-voting preferred stock. There were 452,000 shares and 538,000 shares of Series 1 Preferred Stock issued and outstanding as of December 31, 2020 and 2019, respectively. There were no shares of Series 2 or 3 Preferred Stock issued and outstanding as of December 31, 2020 and 2019. The Series 1 Preferred Stock was issued together with warrants for a combined purchase price of $100.00 per share of Series 1 Preferred Stock and one warrant to purchase 10 shares of common stock. During the year ended December 31, 2020 and 2019, 86,000 shares and 37,000 shares, respectively of Series 1 Preferred Stock were converted to common stock.

As of December 31, 2020 and 2019, the Company classified the Series 1 preferred stock within mezzanine equity, as the Series 1 preferred stock is redeemable at the option of the holders upon passage of time, which is outside of the Company's control to prevent.

The Series 1 Preferred Stock is not currently redeemable and is only redeemable upon a fundamental change at a redemption price. The Company does not believe a fundamental change is considered probable until it occurs. Subsequent adjustment of the amount presented within mezzanine equity to its redemption amount is unnecessary if it is not probable that the instrument will become redeemable. As (i) the Series 1 Preferred Stock is only redeemable upon a fundamental change, the occurrence of which is not probable, and (ii) the occurrence of Transition Date (defined below) is probable, the Company did not accrete the Series 1 Preferred Stock to its redemption amount.

Optional Conversion

Each share of Preferred Stock is initially convertible into 10 shares of Common Stock. The conversion price at which Preferred Stock may be converted into shares of common stock, is subject to adjustment in connection with certain specified events.

Redemption

Until the applicable Transition Date (defined below), at any time on or after the date that is the fifth (5th) anniversary of the initial issue date of the applicable series of preferred stock, all or any portion of the preferred stock is redeemable at the option of the holder at a redemption price of $100.00 per share (for Series 1 and Series 2 Preferred Stock) and $140.00 per share (for Series 3 Preferred Stock). The "Transition Date" means:

- With respect to the Series 1 Preferred Stock, the first date following August 21, 2021, on which each of the Conditions (as defined below) is met (the "Series 1 Transition Date");
- With respect to the Series 2 Preferred Stock, the first date following the six-month anniversary of the Series 1 Transition Date on which each of the Conditions is met (the "Series 2 Transition Date"); and
- With respect to the Series 3 Preferred Stock, the first date following the six-month anniversary of the Series 2 Transition Date on which each of the Conditions is met.

The "Conditions" mean: (1) the closing price of the Company's common stock has been equal to or exceeded $25.00 per share for 180 calendar days (for determining if the Conditions are met for the Series 1 Preferred Stock and Series 2 Preferred Stock) and $35.00 per share (for the Series 3 Preferred Stock) for 180 calendar days; (2) the 50-day average trading volume of the Company's common stock on the Nasdaq stock market is greater than 50,000 shares; and (3) a Phase 3 or Phase 2 pivotal clinical trial for one of the Company's CAR-T product candidates has been initiated, meaning that at least one clinical trial site has been activated.

Dividends

Shares of Preferred Stock will be entitled to receive dividends equal to (on an as-if-converted-to-common stock basis), and in the same form and manner as, dividends actually paid on shares of common stock.

Liquidation

Until the applicable Transition Date, in the event of a liquidation, dissolution, winding up or deemed liquidation, holders of the Preferred Stock will receive a payment equal to the applicable per share purchase price of their Preferred Stock before any proceeds are distributed to the holders of Common Stock. The liquidation preferences, protective voting provisions and redemption rights of the Preferred Stock will terminate upon the occurrence of certain events.

Voting

Shares of Preferred Stock will generally have no voting rights, except to the extent expressly provided in the Company's certificate of incorporation or as otherwise required by law.

NOTE 7 - STOCKHOLDERS' EQUITY AND SHARE-BASED COMPENSATION PLANS

Stockholder's Equity

On October 5, 2018, the Company entered into an Open Market Sale Agreement (the “Sale Agreement”) with Jefferies LLC ("Jefferies"), as sales agent, pursuant to which the Company may offer and sell, from time to time, through Jefferies, shares of the Company’s common stock having an aggregate offering price of up to $60.0 million. The shares will be offered and sold pursuant to the Company’s prospective supplement to its shelf registration statement on Form S-3 (the “Prospective Supplement”). During the year ended December 31, 2019, the Company received $9.0 million in net proceeds from the sale of 259,115 shares of its common stock in the open market. On August 16, 2019, in connection with the Public Offering, the Company delivered written notice to Jefferies that the Company was suspending and terminating the Prospectus Supplement related to the shares of its common stock issuable pursuant to the Sale Agreement. The Company will not make any sales of its securities pursuant to the Sales Agreement, unless and until a new prospectus supplement is filed. Other than the termination of the Prospectus Supplement, the Sale Agreement remains in full force and effect.

Share-Based Compensation Plans

The Company has five share-based compensation plans, including the 2019 Equity Incentive Plan the ("2019 Plan") which was adopted in June 2019. Each plan authorizes the granting of shares of common stock and options to purchase common stock to employees and directors of the Company, as well as non-employee consultants, and allows the holder of the option to purchase common stock at a stated exercise price. The only plan under which the Company may currently grant equity awards is the 2019 Equity Incentive Plan although there remain outstanding awards under the other four plans. Options vest according to the terms of the grant, which may be immediately or based on the passage of time, generally over four years, and have a term of up to 10 years. Unexercised stock options terminate on the expiration date of the grant. The Company recognizes the share-based compensation expense over the requisite service period of the individual grantees, which generally equals the vesting period.

2019 Equity Incentive Plan

The 2019 Plan, is designed to secure and retain the services of the Company’s employees and directors. The 2019 Plan is successor to and continuation of the 2014 Equity Incentive Plan, as amended, the ("2014 Plan"), and no additional awards may be issued from the 2014 Plan. Subject to adjustment for certain changes in the Company’s capitalization, the aggregate number of shares of common stock that may be issued under the 2019 Plan (the "Share Reserve") will not exceed the sum of (i) 250,000 new shares, plus (ii) an additional 600,000 shares that were approved at the Company’s Special Meeting of Stockholders in January 2020, and plus (iii) an additional 500,000 shares that were approved at the Company's Annual meeting of Stockholders in June 2020, and plus (iv) the Prior Plans’ Returning Shares, as defined in the 2019 Plan documents, in an amount not to exceed 600,540 shares, including any stock award granted under the 2014 Plan, 2011 Stock Option Plan, as amended, or 2006 Stock Option Plan, as amended, that were outstanding as of the date the 2019 Plan was approved by the Company's stockholders, as such shares become available from time to time.

The following shares of common stock, or the 2019 Plan Returning Shares, will also become available again for issuance under the 2019 Plan: (i) any shares subject to a stock award granted under the 2019 Plan that are not issued because such stock award expires or otherwise terminates without all of the shares covered by such stock award having been issued; (ii) any shares subject to a stock award granted under the 2019 Plan that are not issued because such stock award is settled in cash; and (iii) any shares issued pursuant to a stock award granted under the 2019 Plan that are forfeited back to or repurchased by the Company because of a failure to vest.

The 2019 Plan provides for the grant of incentive stock options, non-statutory stock options, stock appreciation rights, restricted stock awards, restricted stock unit awards, performance stock awards, and other stock awards.

At December 31, 2020 and 2019, outstanding awards were comprised of the following:

	December 31, 2020	December 31, 2019
Options	1,425,207	471,282
Inducement option awards	85,761	96,560
Restricted stock units	129,361	5,609
Inducement restricted stock units outstanding	500	750
Total outstanding awards	1,640,829	574,201

Grant Date Fair Value

The valuation of the share-based compensation awards is a significant accounting estimate that requires the use of judgments and assumptions that are likely to have a material impact on the financial statements. The fair value of option grants is determined using the Black-Scholes option-pricing model. Expected volatilities utilized in the model are based on historical volatility of the Company's common stock. Similarly, the dividend yield is based on historical experience and the estimate of future dividend yields. The risk-free interest rate is derived from the U.S. Treasury yield curve in effect at the time of grant. The expected term of the options is based on the average period the stock options are expected to remain outstanding. As the Company does not have sufficient historical information to develop reasonable expectations about future exercise patterns and post-vesting employment termination behavior, the expected term is calculated as the midpoint between the weighted-average vesting term and the contractual expiration period also known as the simplified method.

The fair value of the option grants has been estimated, with the following weighted-average assumptions:

	Year Ended	
	December 31, 2020	December 31, 2019
Options granted	1,352,595	276,830
Weighted-average exercise price	7.59	26.12
Weighted-average grant date fair value	5.29	16.99
Assumptions:		
Risk-free interest rate	0.82 %	2.23 %
Volatility	85 %	72 %
Expected life (years)	5.83	6.04
Expected dividend yield	— %	— %

Share-Based Compensation Activity

The following table summarizes the stock option activity for all stock plans during the year ended December 31, 2020 and 2019 as follows:

Options	Outstanding Stock Options	Weighted Average Exercise Price	Weighted Average Remaining Contractual Term *(in years)*	Aggregate Intrinsic Value *(in thousands)*
Balance at December 31, 2018	575,924	$ 109.01	8.09	$ 87
Granted	276,830	$ 26.12		
Exercised	(220)	$ 25.50		
Forfeited	(284,692)	$ 93.81		
Balance at December 31, 2019	567,842	$ 76.25	7.82	$ 12
Granted	1,352,595	$ 7.59		
Exercised	—			
Forfeited	(409,469)	$ 29.86		
Balance at December 31, 2020	1,510,968	$ 27.36	8.19	$ 379
Exercisable at December 31, 2020	339,972	$ 91.97	5.61	$ —

For the years ended December 31, 2020 and 2019, the Company received cash of less than $0.1 million and $0.1 million, respectively, upon option exercises.

The following table summarizes the options outstanding and exercisable at December 31, 2020:

Options Outstanding				Options Exercisable		
Exercise Price	Total Shares	Weighted Average Remaining Contractual Term *(in years)*	Weighted Average Exercise Price	Total Shares	Weighted Average Remaining Contractual Term *(in years)*	Weighted Average Exercise Price
$2.97 to $5.05	676,000	9.95	$ 2.97	—	0.00	$ —
$5.06 to $12.90	125,301	9.40	$ 8.41	1,549	8.83	$ 9.62
$12.91 to $15.85	307,904	6.75	$ 13.60	—	0.00	$ —
$15.86 to $81.25	217,682	6.61	$ 42.24	163,911	6.12	$ 44.40
$81.26 to $234.70	184,081	5.19	$ 135.21	174,512	5.01	$ 137.38
Total	1,510,968	8.19	$ 27.36	339,972	5.61	$ 91.97

The following table summarizes the stock award activity for all restricted stock units during the year ended December 31, 2020:

Awards	Outstanding Restricted Stock Awards and Units	Weighted-Average Grant Date Fair Value Per Share	Outstanding Aggregate Intrinsic Value (in thousands)	Total Fair Value of Restricted Awards Vested (in thousands)
Balance at December 31, 2018	24,615	$ 80.23	$ 719	
Granted	3,000	$ 33.30		
Vested	(14,478)	$ 64.16	$ 240	$ 929
Forfeited	(6,778)	$ 82.44		
Balance at December 31, 2019	6,359	$ 92.29	$ 82	
Granted	239,023	$ 4.70		
Vested	(2,309)	$ 96.14	$ 30	$ 222
Forfeited	(113,212)	$ 6.73		
Balance at December 31, 2020	129,861	$ 5.59	$ 458	

2014 Employee Stock Purchase Plan

The 2014 Employee Stock Purchase Plan, the "ESPP", provides for eligible Company employees, as defined by the ESPP, to be given an opportunity to purchase the Company's common stock at a discount, through payroll deductions, with stock purchases being made upon defined purchase dates. The ESPP authorizes the issuance of up to 55,000 shares of the Company's common stock to participating employees and allows eligible employees to purchase shares of common stock at a 15% discount from the lesser of the grant date or purchase date fair market value.

A summary of activity within the ESPP follows:

	Year Ended	
(in thousands except share data)	December 31, 2020	December 31, 2019
Deductions from employees	$ 56	$ 70
Share-based compensation expense recognized	$ 96	$ 95
Remaining share-based compensation expense	$ —	$ 206
Proceeds received by the Company for ESPP	$ 78	$ 98
Weighted-average purchase price per common share	$ 5.21	$ 12.25
Number of shares purchased by employees under ESPP	14,975	8,000

As of December 31, 2020, there were 18,488 shares available for issuance under the ESPP.

Share-Based Compensation Expense

Share-based compensation expense by classification for December 31, 2020 and 2019 are as follows:

	Year Ended	
(in thousands)	December 31, 2020	December 31, 2019
General and administrative	$ 3,170	$ 4,017
Research and development	1,861	3,321
Total	$ 5,031	$ 7,338

At December 31, 2020, total compensation cost not yet recognized was $5.3 million and the weighted-average period over which this amount is expected to be recognized is 2.03 years. The aggregate fair value of options and restricted shares vesting in the years ended December 31, 2020 and 2019 was $4.8 million and $8.9 million, respectively.

NOTE 8 - COMMITMENTS AND CONTINGENCIES

Co-Development and Co-Commercialization Agreement - Adaptimmune Therapeutics plc

On December 16, 2016, the Company entered into a Co-Development and Co-Commercialization Agreement with and Adaptimmune Therapeutics plc (Adaptimmune) in order to facilitate a staged collaboration to evaluate, develop and commercialize next generation T cell therapies. Under the Agreement, the parties agreed to evaluate the Company's GoTCR technology (inducible MyD88/CD40 co-stimulation, or iMC) with Adaptimmune's affinity-optimized SPEAR® T cells for the potential to create enhanced TCR product candidates. Depending on results of the preclinical proof-of-concept phase, the parties expect to progress to a two-target co-development and co-commercialization phase. To the extent necessary, and in furtherance of the parties' proof-of-concept and co-development efforts, the parties granted each other a royalty-free, non-transferable, non-exclusive license covering their respective technologies for purposes of facilitating such proof-of-concept and co-development efforts. In addition, as to covered therapies developed under the agreement, the parties granted each other a reciprocal exclusive license for the commercialization of such therapies. With respect to any joint commercialization of a covered therapy, the parties agreed to negotiate in good faith the commercially reasonable terms of a co-commercialization agreement. The parties also agreed that any such agreement shall provide for, among other things, equal sharing of the costs of any such joint commercialization and the calculation of profit shares as set forth in the Agreement. The Agreement will expire on a country-by-country basis once the parties cease commercialization of the T cell therapies covered by the Agreement, unless earlier terminated by either party for material breach, non-performance or cessation of development, bankruptcy/insolvency, or failure to progress to co-development phase.

License Agreement - Baylor

In March 2016, the Company and Baylor College of Medicine ("BCM") entered into two additional license agreements pursuant to which the Company obtained exclusive rights to technologies and patent rights owned by BCM. The Company paid BCM a nonrefundable license fee of $100,000 and could incur additional payments upon the achievement of certain milestone events as set forth in the agreement. If the Company is successful in developing any of the licensed technologies, resulting sales would be subject to a royalty payment in the low single digits.

License Agreement - Agensys, Inc.

On December 10, 2015, the Company and Agensys, Inc. ("Agensys"), entered into a license agreement (the "Agensys Agreement"), pursuant to which (i) Agensys granted the Company, within the field of cell and gene therapy of diseases in humans, an exclusive, worldwide license and sublicense to its patent rights directed to prostate stem cell antigen 1 ("PSCA") and related antibodies, and (ii) the Company granted Agensys a non-exclusive, fully paid license to the Company's patents directed to inventions that were made by the Company in the course of developing the Company's licensed products, solely for use with Agensys therapeutic products containing a soluble antibody that binds to PSCA or, to the extent not based upon the Company's other proprietary technology, to non-therapeutic applications of antibodies not used within the field. As consideration for the rights granted to the Company under the Agreement, the Company agreed to pay to Agensys a non-refundable upfront fee of $3.0 million, which was included in license fee expense. The Company is also required to make aggregate milestone payments to Agensys of up to (i) $5 million upon the first achievement of certain specified clinical milestones for its licensed products, (ii) $50 million upon the achievement of certain specified clinical milestones for each licensed product, and (iii) $75 million upon the achievement of certain sales milestones for each licensed product. The Agreement additionally provides that the Company will pay to Agensys a royalty that ranges from the mid to

high single digits based on the level of annual net sales of licensed products by the Company, its affiliates or permitted sublicensees. The royalty payments are subject to reduction under specified circumstances. These milestone and royalty payments will be expensed as incurred. Under the Agreement, Agensys also was granted the option to obtain an exclusive license, on a product-by-product basis, from the Company to commercialize in Japan each licensed product developed under the Agensys Agreement that has completed a phase 2 clinical trial. As to each such licensed product, if Agensys or its affiliate, Astellas Pharma, Inc., exercises the option, the Agensys Agreement provides that the Company will be paid an option exercise fee of $5 million. In addition, the Agensys Agreement provides that the Company will be paid a royalty that ranges from the mid to high single digits based on the level of annual net sales in Japan of each such licensed product. If the option is exercised, the aggregate milestone payments payable by the Company to Agensys, described above with respect to each licensed product, would be reduced by up to an aggregate of $65 million upon the achievement of certain specified clinical and sales milestones. The Agensys Agreement will terminate upon the expiration of the last royalty term for the products covered by the Agensys Agreement, which is the earlier of (i) the date of expiration or abandonment of the last valid claim within the licensed patent rights covering any licensed products under the Agreement, (ii) the expiration of regulatory exclusivity as to a licensed product, and (iii) 10 years after the first commercial sale of a licensed product. Either party may terminate the Agensys Agreement upon a material breach by the other party that remains uncured following 60 days after the date of written notice of such breach (or 30 days if such material breach is related to failure to make payment of amounts due under the Agensys Agreement) or upon certain insolvency events. In addition, Agensys may terminate the Agensys Agreement immediately upon written notice to the Company if the Company or any of its affiliates or permitted sublicensees commences an interference proceeding or challenges the validity or enforceability of any of Agensys' patent rights.

License Agreement - BioVec

On June 10, 2015, the Company and BioVec Pharma, Inc. ("BioVec") entered into a license agreement (the "BioVec Agreement") pursuant to which BioVec agreed to supply the Company with certain proprietary cell lines and granted to the Company a non-exclusive, worldwide license to certain of its patent rights and related know-how related to such proprietary cell lines. As consideration for the products supplied and rights granted to the Company under the BioVec Agreement, the Company agreed to pay to BioVec an upfront fee of $100,000 within ten business days of the effective date of the BioVec Agreement and a fee of $300,000 within ten business days of its receipt of the first release of GMP lot of the products licensed under the BioVec Agreement. In addition, the Company agreed to pay to BioVec an annual fee of $150,000, commencing 30 days following the first filing of an Investigational New Drug Application (an IND filing), or its foreign equivalent, for a product covered by the license; with such annual fees being creditable against any royalties payable by the Company to BioVec under the BioVec Agreement. The Company also is required to make a $250,000 milestone payment to BioVec for each of the first three licensed products to enter into a clinical phase trial and one-time milestone payments of $2.0 million upon receipt of a registration granted by the Federal Drug Administration or European Medicines Agency on each of the Company's first three licensed products. The BioVec Agreement additionally provides that the Company will pay to BioVec a royalty in the low single digits on net sales of products covered by the BioVec Agreement. The Company may also grant sublicensees under the licensed patent rights and know-how to third parties for limited purposes related to the use, sale and other exploitation of the products licensed under the BioVec Agreement. The BioVec Agreement will continue until terminated. The BioVec Agreement may be terminated by the Company, in its sole discretion, at any time upon 90 days written notice to BioVec. Either party may terminate the BioVec Agreement in the event of a breach by the other party of any material provision of the BioVec Agreement that remains uncured on the date that is 60 days after written notice of such failure or upon certain insolvency events that remain uncured following the date that is 30 days after the date of written notice to a party regarding such insolvency event.

Litigation

Securities Litigation

On August 11, 2020, the following derivative complaints were voluntarily dismissed by the plaintiffs following the May 2020 dismissal of the securities class action complaint captioned Nipun Kakkar v. Bellicum Pharmaceuticals, Inc., Rick Fair and Alan Musso, and are no longer pending: (i) a purported shareholder derivative complaint captioned Seung Paik v. Richard A. Fair, et al. against the Company's directors and certain of the Company's officers filed on July 19, 2018 in the U.S. District Court for the Southern District of Texas, Houston Division; and (ii) another purported shareholder derivative complaint captioned Scott Ludovissy and Ann Gordon Trammell v. Richard A. Fair, et al. filed July 8, 2019 against the same defendants in the same court. On September 18, 2020, an additional purported derivative complaint captioned Mildred Taylor and Jessica Armor v. Richard A. Fair, et al. filed November 1, 2019 in the District of Delaware was voluntarily dismissed by the plaintiffs.

Other Litigation

On May 29, 2019, Bellicum was served with a second amended complaint indicating that the Company had been added as an additional defendant in an ongoing civil tort lawsuit, captioned Kelly v. Children's Hospital of Los Angeles et al., filed in the Los Angeles County Superior Court, Case No. BC681477. On July 10, 2019 plaintiffs filed a third amended complaint seeking unspecified monetary damages including punitive damages and alleging claims for wrongful death, negligence, breach of fiduciary duty, fraud, medical battery on decedent, medical battery on individual plaintiffs, products liability - failure to warn, breach of express warranty and products liability design or manufacturing defect. Bellicum filed a demurrer and motion to strike plaintiffs' third amended complaint, which were granted in part on August 5, 2020 with the Court dismissing (without prejudice) all claims against Bellicum with the exception of the breach of express warranty and products liability design or manufacturing defect causes of action. The Court also granted Bellicum's motion to strike plaintiffs' claim for punitive damages. On September 15, 2020, plaintiffs filed a fourth amended complaint alleging the same causes of action and damages against Bellicum as were pled in the third amended complaint. On November 3, 2020 Bellicum filed a demurrer and motion to strike the fourth amended complaint, which is set for hearing on April 30, 2021. A trial date has not been set in the case.

NOTE 9 - INCOME TAXES

The reconciliation between federal income taxes at the statutory U.S. federal income tax rate and the Company's income tax expense for the year is as follows:

(in thousands)	December 31, 2020	December 31, 2019
Tax benefit at statutory rate	$ (1,658)	$ (23,591)
Other	200	(294)
Stock based compensation	642	2,674
Offering issuance costs and changes in fair value of warrants and private placement option	(9,687)	4,657
Deferred tax valuation allowances	11,690	19,542
Research and development credit	(1,187)	(2,988)
Income tax expense	$ —	$ —

Deferred income taxes reflect the net tax effect of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes, and the amounts used for income tax purposes. Significant components of the Company's deferred taxes as of December 31, 2020 and 2019 are as follows:

(in thousands)	December 31, 2020	December 31, 2019
Deferred tax assets (liabilities):		
Net operating loss carryforward	$ 94,132	$ 81,960
Stock compensation	3,539	3,270
Intangible assets	7,682	8,077
Research and development credit	17,787	16,601
Operating lease assets	(213)	(1,229)
Operating lease liabilities	354	1,538
Other	976	2,336
Total deferred tax assets, net of deferred tax liabilities	124,257	112,553
Valuation allowance	(124,257)	(112,553)
Net deferred tax	$ —	$ —

Net operating loss carryforwards and research tax credits as of December 31, 2020 and 2019 are as follows:

(in thousands)	December 31, 2020	December 31, 2019
U.S. federal income tax net operating loss carryforwards	$ 448,250	$ 390,286
U.K. net operating loss carryforwards	$ 133	$ —
U.S. federal research tax credits	$ 12,535	$ 11,348
Texas research tax credits	$ 5,252	$ 5,252

The Company has $227.0 million of U.S. federal net operating loss carryovers that have no expiration date and the remaining begin to expire in 2025. The U.S. Federal and state research credits will begin to expire in 2028 and 2034 respectively. No study has been performed on the research and development (R&D) credits and gross R&D credits in the amount of $17.8 million could be limited based on review by the Internal Revenue Service.

The Internal Revenue Code Section 382 limits NOL and tax credit carry forwards when an ownership change of more than 50% of the value of the stock in a loss corporation occurs. Accordingly, the ability to utilize remaining NOL and tax credit carryforwards may be significantly restricted.

In assessing the realization of deferred tax assets, management considers whether it is more likely than not that some portion or all of the deferred tax asset will be realized. The ultimate realization of deferred tax assets is dependent upon the Company attaining future taxable income during periods in which those temporary differences become deductible.

Due to the uncertainty surrounding the realization of the benefits of its deferred assets, including NOL carryforwards, the Company has provided a 100% valuation allowance on its net deferred tax assets at December 31, 2020 and 2019. The changes in the valuation allowance was an increase of $11.7 million and an increase of $19.5 million for the years ended December 31, 2020 and 2019, respectively.

NOTE 10 - SUBSEQUENT EVENTS

Houston R&D Facility

On February 2, 2021 the Company executed a term sheet to exit the lease of the R&D facility on Reed Road in Houston, Texas. Under the terms of the agreement a third party will assume the lease for the facility. In addition, the third party will provide $1.1 million of consideration to the Company for substantially all of the property, plant and equipment associated with the location. The consideration will include $0.9 million of cash and an unsecured promissory note for $0.2 million.

On February 26, 2021 the Company completed the transaction as contemplated in the aforementioned term sheet. The Company fully reserved for the transaction through the impairment recognized in 2020.

South San Francisco Facility

On March 15, 2021 the Company entered an agreement to terminate its sub-lease of the South San Francisco office space contingent upon consent of the prime lessor. The decision to exit this lease reflects the ability of the Company to carry on administrative function of the Company remotely as proven through necessity during the pandemic. Under the terms of the agreement, the company will pay a lease termination fee of $0.9 million. As of December 31, 2020, the lease termination fee has been fully accrued as lease expense. The Company does not anticipate additional material expenses associated with exiting the lease.

Compliance with NASDAQ Listing Rules

On November 23, 2020, the Company received notice (the "Notice") from The Nasdaq Stock Market LLC ("Nasdaq) advising the Company that for the last 30 consecutive business days preceding the date of the Notice, the Company's Market Value of Listed Securities ("MVLS") had been below the minimum of $35,000,000 required for continued listing on The Nasdaq Capital Market pursuant to Nasdaq Listing Rule 5550(b)(2) (the "MVLS Requirement"). On February 16, 2021, the Company received notification from Nasdaq that the Company had regained compliance with the MVLS Requirement.

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

Our management, with the participation of our principal executive officer and principal financial officer, evaluated the effectiveness of our disclosure controls and procedures, as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act, as of December 31, 2020. The term “disclosure controls and procedures,” as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act, means controls and other procedures of a company that are designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the SEC rules and forms. Disclosure controls and procedures include, without limitation, controls and procedures designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is accumulated and communicated to the company’s management, including its principal executive and principal financial officers, as appropriate, to allow timely decisions regarding required disclosure.

Management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving their objectives and management necessarily applies its judgment in evaluating the cost-benefit relationship of possible controls and procedures. Based on the evaluation of our disclosure controls and procedures as of December 31, 2020, our Chief Executive Officer, Chief Financial Officer and Corporate Controller concluded that, as of such date, our disclosure controls and procedures were effective.

Management’s Annual Report on Internal Controls over Financial Reporting

Management is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in Exchange Act Rule 13a-15(f) and 15d-15(f). Our internal control over financial reporting is designed under the supervision of our management to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with United States generally accepted accounting principles.

The Company's internal control over financial reporting includes those policies and procedures that: (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the Company; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with U.S. generally accepted accounting principles, and that receipts and expenditures of the Company are being made only in accordance with authorizations of management and directors of the Company; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the Company's assets that could have a material effect on the Consolidated Financial Statements.

Management, including our Chief Executive Officer, has assessed the effectiveness of our internal control over financial reporting based on the framework set forth by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) in Internal Control-Integrated Framework. Based on those criteria and our evaluation, management has concluded that our internal control over financial reporting was effective as of December 31, 2020.

Inherent Limitations of Internal Controls

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risks that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Changes in Internal Control over Financial Reporting

There were no changes in our internal control over financial reporting during our latest fiscal quarter that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

ITEM 9B. Other Information

On March 29, 2021, our board of directors appointed Richard A. Fair as our principal financial officer and principal accounting officer.

Mr. Fair, age 52, has served as our President and Chief Executive Officer and a member of our Board since January 2017. From January 2014 to January 2017, Mr. Fair served as Senior Vice President, Therapeutic Head Oncology Global Product Strategy at Genentech, Inc., a biotechnology company that in 2009 was acquired and became a subsidiary of Roche Holding AG. His responsibilities included leadership of lifecycle strategy and global commercialization of the organization's late stage and commercial oncology and hematology portfolio. From April 2006 to January 2014, Mr. Fair held other positions at Genentech, including Vice President, Global Product Strategy Hematology & Signaling, from November 2012 through December 2013, and Vice President, Sales & Marketing, Oral Oncolytics, from May 2010 to November 2012. Prior to Genentech, Mr. Fair held positions at Johnson & Johnson, a public pharmaceutical and medical device company. Since October 2018, Mr. Fair has served as a member of the board of directors of Clovis Oncology, Inc., a public biotechnology company. Mr. Fair received his B.S. in computer science from the University of Michigan and his MBA, with a dual concentration in finance and management, from Columbia University.

PART III

ITEM 10. Directors, Executive Officers and Corporate Governance

The information required by this item will be set forth in the sections headed “Election of Directors,” “Information about our Executive Officers” and “Section 16(a) Beneficial Ownership Reporting Compliance” in our definitive proxy statement for our Annual Meeting of Stockholders, or our Proxy Statement, to be filed with the SEC within 120 days after the end of the fiscal year ended December 31, 2020, and is incorporated herein by reference.

ITEM 11. Executive Compensation

The information required by this item will be set forth in the section headed “Executive and Director Compensation” in our Proxy Statement and is incorporated herein by reference.

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

The information required by this item will be set forth in the section headed “Equity Benefit Plans” and “Security Ownership of Certain Beneficial Owners and Management” in our Proxy Statement and is incorporated herein by reference.

The information required by Item 201(d) of Regulation S-K will be set forth in the section headed “Executive and Director Compensation” in our Proxy Statement and is incorporated herein by reference.

ITEM 13. Certain Relationships and Related Party Transactions, and Director Independence

The information required by this item will be set forth in the sections headed “Certain Relationships and Related Party Transactions” and “Election of Directors” in our Proxy Statement and is incorporated herein by reference.

ITEM 14. Principal Accounting Fees and Services

The information required by this item will be set forth in the section headed “Principal Accounting Fees and Services” in our Proxy Statement and is incorporated herein by reference.

PART IV

ITEM 15. Exhibits, Financial Statements and Schedules

(a)(1) Financial Statements.

The response to this portion of Item 15 is set forth under Part II, Item 8 above.

(a)(2) Financial Statement Schedules.

We have omitted these schedules because they are not required, or are not applicable, or the required information is shown in the consolidated financial statements or notes thereto.

(a)(3) Exhibits.

Exhibit Number	Description
3.1	Amended and Restated Certificate of Incorporation, as amended by Certificate of Amendment of the Amended and Restated Certificate of Incorporation of the Registrant and the Second Certificate of Amendment of the Amended and Restated Certificate of Incorporation of the Registrant (incorporated by reference to Exhibit 3.1 to the Registrant's Quarterly Report Form 10-Q with the SEC on August 6, 2020).
3.2	Amended and Restated Bylaws of the Registrant (incorporated by reference to Exhibit 3.2 to the Registrant's Current Report on Form 8-K, filed with the SEC on August 5, Amended and Restated Bylaws of the Registrant (incorporated by reference to Exhibit 3.2 to the Registrant's Current Report on Form 8-K, filed with the SEC on August 5, 2019).).
3.3	Certificate of Designations, Preferences and Rights of Series 1 Redeemable Convertible Non-Voting Preferred Stock, Series 2 Redeemable Convertible Non-Voting Preferred Stock and Series 3 Redeemable Convertible Non-Voting Preferred Stock of Bellicum Pharmaceuticals, Inc. (incorporated by reference to Exhibit 3.1 to the Registrant's report on Form 8-K, filed with the SEC on August 19, 2019).
4.2	Form of Common Stock Certificate of the Registrant (incorporated by reference to Exhibit 4.1 to the Registrant's Registration Statement on Form S-1, as amended (File No. 333-200328), originally filed with the SEC on November 18, 2014).
4.3	Registration Rights Agreement by and among the Registrant and Baker Brothers Life Sciences, LP, and two of its affiliated funds, dated January 15, 2016 (incorporated by reference to Exhibit 4.4 to Registrant's Registration Statement on Form S-3 (File No. 333-209012), filed with the SEC on January 15, 2016).
4.4	Form of Warrant issued in public offering (incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K (File No. 001-36783), filed with the SEC on August 19, 2019).
4.5	Form of Warrant issued in private offering (incorporated by reference to Exhibit 4.2 to the Registrant's Current Report on Form 8-K (File No. 001-36783), filed with the SEC on August 19, 2019).
4.6	Description of Description of Securities (incorporated by reference to Exhibit 4.7 to the Registrant's Current Report on Form 10K (File No. 001-36783), filed with the SEC on March 12, 2020.
4.7	Securities Purchase Agreement, dated August 16, 2019, by and among the Company and the institutional investors named therein, (incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K (File No. 001-36783), filed with the SEC on August 19, 2019).
4.8	Form of pre-funded warrant (incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K (File No. 001-36783). filed with the SEC on November 2, 2020).
4.9	Form of warrant to purchase common stock (incorporated by reference to Exhibit 4.2 to the Registrant's Current Report on Form 8-K (File No.001-36783), filed with the SEC on November 2, 2020).
10.1+	Form of Indemnification Agreement by and between the Registrant and its directors and officers (incorporated by reference to Exhibit 10.1 to the Registrant's Registration Statement on Form S-1, as amended (File No. 333-200328), originally filed with the SEC on November 18, 2014).
10.2+	Bellicum Pharmaceuticals, Inc. 2006 Stock Option Plan and Form of Nonqualified Stock Option Agreement (incorporated by reference to Exhibit 10.2 to the Registrant's Registration Statement on Form S-1, as amended (File No. 333-200328), originally filed with the SEC on November 18, 2014).
10.3+	Bellicum Pharmaceuticals, Inc. 2011 Stock Option Plan and Forms of Incentive Stock Option Grant Agreement and Nonqualified Stock Option Agreement (incorporated by reference to Exhibit 10.3 to the Registrant's Registration Statement on Form S-1, as amended (File No. 333-200328), originally filed with the SEC on November 18, 2014).

Exhibit Number	Description
10.4(A)+	Bellicum Pharmaceuticals, Inc. 2014 Equity Incentive Plan, as amended (incorporated by reference to Exhibit 10.2 to the Registrant's Quarterly Report on Form 10-Q filed with the SEC on May 5, 2019).
10.4(B)+	Form of Stock Option Grant Notice and Option Agreement under the 2014 Equity Incentive Plan (incorporated by reference to Exhibit 10.4(B) to the Registrant's Annual Report on Form 10-K filed with the SEC on March 13, 2018).
10.4(C)+	Form of Stock Option Grant Notice and Option Agreement under the 2014 Equity Incentive Plan (with accelerated vesting) (incorporated by reference to Exhibit 10.4(C) to the Registrant's Annual Report on Form 10-K filed with the SEC on March 13, 2018).
10.4(D)+	Form of Restricted Stock Award Notice and Restricted Stock Award Agreement under the 2014 Equity Incentive Plan (incorporated by reference to Exhibit 10.4(D) to the Registrant's Annual Report on Form 10-K filed with the SEC on March 13, 2018).
10.4(E)+	Form of Restricted Stock Unit Notice and Restricted Stock Unit Agreement under the 2014 Equity Incentive Plan (incorporated by reference to Exhibit 10.4(E) to the Registrant's Annual Report on Form 10-K filed with the SEC on March 13, 2018).
10.4(F)+	Form of Stock Option Grant Notice and Option Agreement under the 2014 Equity Incentive Plan (Inducement Award)(incorporated by reference to Exhibit 10.4(F) to the Registrant's Annual Report on Form 10-K filed with the SEC on March 13, 2018).
10.4(G)+	Form of Stock Option Grant Notice and Option Agreement under the 2014 Equity Incentive Plan (Non-Employee Director Form) (incorporated by reference to Exhibit 10.4(G) to the Registrant's Annual Report on Form 10-K filed with the SEC on March 13, 2018).
10.5(A)+	Bellicum Pharmaceuticals, Inc. Bellicum Pharmaceuticals, Inc. 2019 Equity Incentive Plan, as amended (incorporated by reference to Exhibit 10.2 to the Registrant's Quarterly Report on Form 10-Q filed with the SEC on August 6, 2020).
10.5(B)+	Forms of stock option grant notice, stock option agreement and notice of exercise, and forms of restricted stock award notice and restricted stock award agreement under the Bellicum Pharmaceuticals, Inc. 2019 Equity Incentive Plan.
10.6+	Bellicum Bellicum Pharmaceuticals, Inc. Non-Employee Director Compensation Policy, Inc. Non-Employee Director Compensation Policy (incorporated by reference to Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q filed with SEC on August 6, 2020).
10.8+	Incentive Award Program, as amended on February 19, 2018 (incorporated by reference to Exhibit 10.7 to the Registrant's Annual Report on Form 10-K filed with the SEC on March 13, 2018).
10.9+	Letter Agreement by and between the Registrant and Richard A. Fair, dated January 25, 2017 (incorporated by reference to Exhibit 10.43 to the Registrant's Annual Report on Form 10-K filed with the SEC on March 13, 2017).
10.12+	Employment Agreement by and between Registrant and Shane M. Ward, effective May 29, 2018 (incorporated by reference to Exhibit 10.3 to the Registrant's Quarterly Report on Form 10-Q filed with the SEC on August 7, 2018).
10.15	Notice of Expansion of Licensed Field to Obtain Additional Exclusive Rights (incorporated by reference to Exhibit 10.14 to the Registrant's Registration Statement on Form S-1, as amended (File No. 333-200328), originally filed with the SEC on November 18, 2014).
10.16*	Amended and Restated License Agreement by and between the Registrant and ARIAD Pharmaceuticals, Inc., dated March 7, 2011 (incorporated by reference to Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q filed with the SEC on November 5, 2020).
10.17*	Omnibus Amendment Agreement by and between Registrant and ARIAD Pharmaceuticals, Inc., dated October 3, 2014 (incorporated by reference to Exhibit 10.2 to the Registrant's Quarterly Report on Form 10-Q filed with the SEC on November 5, 2020).
10.18*	Exclusive License Agreement by and between the Registrant and Baylor College of Medicine, dated March 20, 2008 (incorporated by reference to Exhibit 10.3 to the Registrant's Quarterly Report on Form 10-Q filed with the SEC on November 5, 2020).
10.19*	Exclusive License Agreement by and between the Registrant and Baylor College of Medicine, dated June 27, 2010 (incorporated by reference to Exhibit 10.4 to the Registrant's Quarterly Report on Form 10-Q filed with the SEC on November 5, 2020).

Exhibit Number	Description
10.20*	Cancer Research Grant Contract by and between the Registrant and the Cancer Prevention and Research Institute of Texas, dated July 27, 2011 (incorporated by reference to Exhibit 10.5 to the Registrant's Quarterly Report on Form 10-Q filed with the SEC on November 5, 2020).
10.21*	Exclusive License Agreement by and between the Registrant and Baylor College of Medicine, effective November 1, 2014 (incorporated by reference to Exhibit 10.6 to the Registrant's Quarterly Report on Form 10-Q filed with SEC on November 5, 2020).
10.22*	License Agreement by and between the Registrant and BioVec Pharma, Inc., dated as of June 4, 2015 (incorporated by reference to Exhibit 10.2 to the Registrant's Quarterly Report on Form 10-Q filed with the SEC on August 13, 2015).
10.23*	Exclusive License Agreement by and between the Registrant and Agensys, Inc., effective as of December 10, 2015 (incorporated by reference to Exhibit 10.33 to the Registrant's Annual Report on Form 10-K filed with the SEC on March 14, 2016).
10.24*	Co-Development and Co-Commercialisation Agreement by and between the Registrant and Adaptimmune Limited, effective as of December 16, 2016 (incorporated by reference to Exhibit 10.41 to the Registrant's Annual Report on Form 10-K filed with the SEC on March 13, 2017).
10.26	First Amendment to Lease Agreement by and between Registrant and Sheridan Hills Developments L.P., dated September 13, 2013 (incorporated by reference to Exhibit 10.22 to the Registrant's Registration Statement on Form S-1, as amended (File No. 333-200328), originally filed with the SEC on November 18, 2014).
10.27	Second Amendment to Lease Agreement by and between Registrant and Sheridan Hills Developments L.P., dated June 20, 2014 (incorporated by reference to Exhibit 10.23 to the Registrant's Registration Statement on Form S-1, as amended (File No. 333-200328), originally filed with the SEC on November 18, 2014).
10.28	Third Amendment to Lease Agreement by and between Registrant and Sheridan Hills Developments L.P., dated July 21, 2014 (incorporated by reference to Exhibit 10.24 to the Registrant's Registration Statement on Form S-1, as amended (File No. 333-200328), originally filed with the SEC on November 18, 2014).
10.29	Fourth Amendment to Lease Agreement by and between Registrant and Sheridan Hills Developments L.P., dated November 12, 2014 (incorporated by reference to Exhibit 10.25 to the Registrant's Registration Statement on Form S-1, as amended (File No. 333-200328), originally filed with the SEC on November 18, 2014).
10.30	Fifth Amendment to Lease Agreement by and between the Registrant and Sheridan Hills Developments L.P., effective as of September 24, 2015 (incorporated by reference to Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q filed with the SEC on November 9, 2016).
10.31	Lease Agreement by and between the Registrant and Sheridan Hills Developments L.P., dated as of May 6, 2015 (incorporated by reference to Exhibit 10.32 to the Registrant's Annual Report on Form 10-K filed with the SEC on March 14, 2016).
10.32	First Amendment to Lease Agreement by and between the Registrant and Life Science Plaza Investment Group, LP, effective as of July 11, 2016 (incorporated by reference to Exhibit 10.3 to the Registrant's Quarterly Report on Form 10-Q filed with the SEC on August 8, 2016).
10.33	Second Amendment to Lease Agreement by and between the Registrant and Life Science Plaza Investment Group, LP, effective as of September 26, 2016 (incorporated by reference to Exhibit 10.3 to the Registrant's Quarterly Report on Form 10-Q filed with the SEC on November 9, 2016).
10.36	Open Market Sale Agreement[SM], dated October 5, 2018, by and between the Registrant and Jefferies LLC (incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K filed with the SEC on October 5, 2018).
10.37*	Supply Agreement by and between Registrant and Miltenyi Biotech GmbH, dated March 27, 2019 (incorporated by reference to Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q, filed with the SEC on May 7, 2019).
10.38*	Asset Purchase Agreement, dated January 17, 2020, by and between the Registrant and The University of Texas M.D. Anderson Asset Purchase Agreement, dated January 17, 2020, by and between the Registrant and The University of Texas M.D. Anderson Cancer Center Center (incorporated by reference to Exhibit 10.38 to the Registrant's Annual Report on Form 10-K filed with the SEC on March 12, 2020).
10.39	First Amendment to Asset Purchase Agreement, dated February 21, 2020, by and between the Registrant and The University of Texas M.D. Anderson Cancer Center (incorporated by reference to Exhibit 10.39 to the Registrant's Annual Report on Form 10-K filed with the SEC on March 12, 2020).

Exhibit Number	Description
21.1	Subsidiaries of the Registrant.
23.1	Consent of Independent Registered Public Accounting Firm.
24.1	Power of Attorney. Reference is made to the signature page hereto.
31.1	Certification of the Principal Executive Officer and Principal Financial Officer pursuant to Rule 13a-14(a) or 15d-14(a) of the Securities Exchange Act of 1934.
32.1	Certification of the Principal Executive Officer and Principal Financial Officer pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
101.INS**	XBRL Instance
101.SCH**	XBRL Taxonomy Extension Schema
101.CAL**	XBRL Taxonomy Extension Calculation
101.DEF**	XBRL Taxonomy Extension Definition
101.LAB**	XBRL Taxonomy Extension Labels
101.PRE**	XBRL Taxonomy Extension Presentation

+ Indicates management contract or compensatory plan.

* Certain portions of this exhibit (indicated by "[***]") have been omitted as the Registrant as determined (i) the omitted information is not material and (ii) the omitted information would likely cause harm to the Registrant if publicly disclosed.

This certification is deemed not filed for purposes of Section 18 of the Securities Exchange Act of 1934, as amended, or otherwise subject to the liability of that section, nor shall it be deemed incorporated by reference into any filing under the Securities Act of 1933, as amended, or the Securities Exchange Act of 1934, as amended.

ITEM 15. Form 10-K Summary

Not applicable.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the Registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

Bellicum Pharmaceuticals, Inc.

Date: March 30, 2021

By: /s/ Richard A. Fair
Richard A. Fair
President and Chief Executive Officer

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints Richard A. Fair as his true and lawful attorney-in-fact, with the power of substitution, for him in any and all capacities, to sign any amendments to this report, and to file the same, with exhibits thereto and other documents in connection therewith with the Securities and Exchange Commission, hereby ratifying and confirming all that each of said attorney-in-fact, or his substitute or substitutes may do or cause to be done by virtue hereof. Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the Registrant in the capacities and on the dates indicated:

Signature	Title	Date
/s/ Richard A. Fair Richard A. Fair	President, Chief Executive Officer and Director *(Principal Executive Officer)*	March 30, 2021
/s/ James Brown James Brown	Chairman of the Board of Directors	March 30, 2021
/s/ James M. Daly James M. Daly	Member of the Board of Directors	March 30, 2021
/s/ Stephen R. Davis Stephen R. Davis	Member of the Board of Directors	March 30, 2021
/s/ Reid M. Huber, Ph.D. Reid M. Huber, Ph.D.	Member of the Board of Directors	March 30, 2021
/s/ Judith Klimovsky Judith Klimovsky	Member of the Board of Directors	March 30, 2021
/s/ Jon P. Stonehouse Jon P. Stonehouse	Member of the Board of Directors	March 30, 2021

Exhibit 10.5(B)

STANDARD FORM

BELLICUM PHARMACEUTICALS, INC.
STOCK OPTION GRANT NOTICE
(2019 EQUITY INCENTIVE PLAN)

Bellicum Pharmaceuticals, Inc. (the "***Company***"), pursuant to its 2019 Equity Incentive Plan (the "***Plan***"), hereby grants to Optionholder an option to purchase the number of shares of the Company's Common Stock set forth below. This option is subject to all of the terms and conditions as set forth in this notice, in the Option Agreement, the Plan and the Notice of Exercise, all of which are attached hereto and incorporated herein in their entirety. Capitalized terms not explicitly defined herein but defined in the Plan or the Option Agreement will have the same definitions as in the Plan or the Option Agreement. If there is any conflict between the terms in this notice and the Plan, the terms of the Plan will control.

Optionholder:	_____
Date of Grant:	_____
Vesting Commencement Date:	_____
Number of Shares Subject to Option:	_____
Exercise Price (Per Share):	_____
Total Exercise Price:	_____
Expiration Date:	_____

Type of Grant: o Incentive Stock Option o Nonstatutory Stock Option

Exercise Schedule: x Same as Vesting Schedule o Early Exercise Permitted

Vesting Schedule: **[**One-fourth **(**1/4th) of the shares vest one year after the later of the (i) Vesting Commencement Date and (ii) Date of Grant; the balance of the shares vest in a series of thirty-six (36) successive equal monthly installments measured from the first anniversary of the Vesting Commencement Date, subject to Optionholder's Continuous Service as of each such date**]**

Payment: By one or a combination of the following items (described in the Option Agreement):

x By cash, check, bank draft or money order payable to the Company

x Pursuant to a Regulation T Program if the shares are publicly traded

x By delivery of already-owned shares if the shares are publicly traded

x If and only to the extent this option is a Nonstatutory Stock Option, and subject to the Company's consent at the time of exercise, by a "net exercise" arrangement

STANDARD FORM

Additional Terms/Acknowledgements: Optionholder acknowledges receipt of, and understands and agrees to, this Stock Option Grant Notice, the Option Agreement and the Plan. Optionholder acknowledges and agrees that this Stock Option Grant Notice and the Option Agreement may not be modified, amended or revised except as provided in the Plan. Optionholder further acknowledges that as of the Date of Grant, this Stock Option Grant Notice, the Option Agreement, and the Plan set forth the entire understanding between Optionholder and the Company regarding this option award and supersede all prior oral and written agreements, promises and/or representations on that subject with the exception of (i) options previously granted and delivered to Optionholder, (ii) any compensation recovery policy that is adopted by the Company or is otherwise required by applicable law and (iii) any written employment or severance arrangement that would provide for vesting acceleration of this option upon the terms and conditions set forth therein. By accepting this option, Optionholder consents to receive such documents by electronic delivery and to participate in the Plan through an on-line or electronic system established and maintained by the Company or another third party designated by the Company.

BELLICUM PHARMACEUTICALS, INC.

By:_____
Signature

Title:_____

Date:_____

OPTIONHOLDER:

_____
Signature

Date:_____

ATTACHMENTS: Option Agreement, 2019 Equity Incentive Plan and Notice of Exercise

STANDARD FORM

ATTACHMENT I

BELLICUM PHARMACEUTICALS, INC.
2019 EQUITY INCENTIVE PLAN
OPTION AGREEMENT
(INCENTIVE STOCK OPTION OR NONSTATUTORY STOCK OPTION)

Pursuant to your Stock Option Grant Notice ("***Grant Notice***") and this Option Agreement, Bellicum Pharmaceuticals, Inc.(the "***Company***") has granted you an option under its 2019 Equity Incentive Plan (the "***Plan***") to purchase the number of shares of the Company's Common Stock indicated in your Grant Notice at the exercise price indicated in your Grant Notice. The option is granted to you effective as of the date of grant set forth in the Grant Notice (the "***Date of Grant***"). If there is any conflict between the terms in this Option Agreement and the Plan, the terms of the Plan will control. Capitalized terms not explicitly defined in this Option Agreement or in the Grant Notice but defined in the Plan will have the same definitions as in the Plan.

The details of your option, in addition to those set forth in the Grant Notice and the Plan, are as follows:

1. VESTING. Subject to the provisions contained herein, your option will vest as provided in your Grant Notice. Vesting will cease upon the termination of your Continuous Service.

2. NUMBER OF SHARES AND EXERCISE PRICE. The number of shares of Common Stock subject to your option and your exercise price per share in your Grant Notice will be adjusted for Capitalization Adjustments.

3. EXERCISE RESTRICTION FOR NON-EXEMPT EMPLOYEES. If you are an Employee eligible for overtime compensation under the Fair Labor Standards Act of 1938, as amended (that is, a "***Non-Exempt Employee***"), and except as otherwise provided in the Plan, you may not exercise your option until you have completed at least six (6) months of Continuous Service measured from the Date of Grant, even if you have already been an employee for more than six (6) months. Consistent with the provisions of the Worker Economic Opportunity Act, you may exercise your option as to any vested portion prior to such six (6) month anniversary in the case of (i) your death or disability, (ii) a Corporate Transaction in which your option is not assumed, continued or substituted, (iii) a Change in Control or (iv) your termination of Continuous Service on your "retirement" (as defined in the Company's benefit plans).

4. EXERCISE PRIOR TO VESTING ("EARLY EXERCISE"). If permitted in your Grant Notice (*i.e.*, the "Exercise Schedule" indicates "Early Exercise Permitted") and subject to the provisions of your option, you may elect at any time that is both (i) during the period of your Continuous Service and (ii) during the term of your option, to exercise all or part of your option, including the unvested portion of your option; *provided, however,* that:

a. a partial exercise of your option will be deemed to cover first vested shares of Common Stock and then the earliest vesting installment of unvested shares of Common Stock;

b. any shares of Common Stock so purchased from installments that have not vested as of the date of exercise will be subject to the purchase option in favor of the Company as described in the Company's form of Early Exercise Stock Purchase Agreement;

c. you will enter into the Company's form of Early Exercise Stock Purchase Agreement with a vesting schedule that will result in the same vesting as if no early exercise had occurred; and

d. if your option is an Incentive Stock Option, then, to the extent that the aggregate Fair Market Value (determined at the Date of Grant) of the shares of Common Stock with respect to which your option plus all other Incentive Stock Options you hold are exercisable for the first time by you during any calendar year (under all plans of the Company and its Affiliates) exceeds one hundred thousand dollars ($100,000), your option(s) or portions thereof that exceed such limit (according to the order in which they were granted) will be treated as Nonstatutory Stock Options.

5. METHOD OF PAYMENT. You must pay the full amount of the exercise price for the shares you wish to exercise. You may pay the exercise price in cash or by check, bank draft or money order payable to the Company or in any other manner ***permitted by your Grant Notice,*** which may include one or more of the following:

a. Provided that at the time of exercise the Common Stock is publicly traded, pursuant to a program developed under Regulation T as promulgated by the Federal Reserve Board that, prior to the issuance of Common Stock, results in either the receipt of cash (or check) by the Company or the receipt of irrevocable instructions to pay the aggregate exercise price to the Company from the sales proceeds. This manner of payment is also known as a "broker-assisted exercise", "same day sale", or "sell to cover".

b. Provided that at the time of exercise the Common Stock is publicly traded, by delivery to the Company (either by actual delivery or attestation) of already-owned shares of Common Stock that are owned free and clear of any liens, claims, encumbrances or security interests, and that are valued at Fair Market Value on the date of exercise. "Delivery" for these purposes, in the sole discretion of the Company at the time you exercise your option, will include delivery to the Company of your attestation of ownership of such shares of Common Stock in a form approved by the Company. You may not exercise your option by delivery to the Company of Common Stock if doing so would violate the provisions of any law, regulation or agreement restricting the redemption of the Company's stock.

c. If this option is a Nonstatutory Stock Option, subject to the consent of the Company at the time of exercise, by a "net exercise" arrangement pursuant to which the Company will reduce the number of shares of Common Stock issued upon exercise of your option by the largest whole number of shares with a Fair Market Value that does not exceed the aggregate exercise price. You must pay any remaining balance of the aggregate exercise price not satisfied by the "net exercise" in cash or other permitted form of payment. Shares of Common Stock will no longer be outstanding under your option and will not be exercisable thereafter if those shares (i) are used to pay the exercise price pursuant to the "net exercise," (ii) are delivered to you as a result of such exercise, and (iii) are withheld to satisfy your tax withholding obligations.

6. WHOLE SHARES. You may exercise your option only for whole shares of Common Stock.

7. SECURITIES LAW COMPLIANCE. In no event may you exercise your option unless the shares of Common Stock issuable upon exercise are then registered under the Securities Act or, if not registered, the Company has determined that your exercise and the issuance of the shares would be exempt from the registration requirements of the Securities Act. The exercise of your option also must comply with all other applicable laws and regulations governing your option, and you may not exercise

your option if the Company determines that such exercise would not be in material compliance with such laws and regulations (including any restrictions on exercise required for compliance with Treas. Reg. 1.401(k)-1(d)(3), if applicable).

8. TERM. You may not exercise your option before the Date of Grant or after the expiration of the option's term. The term of your option expires, subject to the provisions of Section 5(h) of the Plan, upon the earliest of the following:

a. immediately upon the termination of your Continuous Service for Cause;

b. three (3) months after the termination of your Continuous Service for any reason other than Cause, your Disability or your death (except as otherwise provided in Section 8(d) below); *provided, however,* that if during any part of such three (3) month period your option is not exercisable solely because of the condition set forth in the section above relating to "Securities Law Compliance," your option will not expire until the earlier of the Expiration Date or until it has been exercisable for an aggregate period of three (3) months after the termination of your Continuous Service; *provided further,* if during any part of such three (3) month period, the sale of any Common Stock received upon exercise of your option would violate the Company's insider trading policy, then your option will not expire until the earlier of the Expiration Date or until it has been exercisable for an aggregate period of three (3) months after the termination of your Continuous Service during which the sale of the Common Stock received upon exercise of your option would not be in violation of the Company's insider trading policy. Notwithstanding the foregoing, if (i) you are a Non-Exempt Employee, (ii) your Continuous Service terminates within six (6) months after the Date of Grant, and (iii) you have vested in a portion of your option at the time of your termination of Continuous Service, your option will not expire until the earlier of (x) the later of (A) the date that is seven (7) months after the Date of Grant, and (B) the date that is three (3) months after the termination of your Continuous Service, and (y) the Expiration Date;

c. twelve (12) months after the termination of your Continuous Service due to your Disability (except as otherwise provided in Section 8(d)) below;

d. eighteen (18) months after your death if you die either during your Continuous Service or within three (3) months after your Continuous Service terminates for any reason other than Cause;

e. the Expiration Date indicated in your Grant Notice; or

f. the day before the tenth (10th) anniversary of the Date of Grant.

If your option is an Incentive Stock Option, note that to obtain the federal income tax advantages associated with an Incentive Stock Option, the Code requires that at all times beginning on the Date of Grant and ending on the day three (3) months before the date of your option's exercise, you must be an employee of the Company or an Affiliate, except in the event

of your death or Disability. The Company has provided for extended exercisability of your option under certain circumstances for your benefit but cannot guarantee that your option will necessarily be treated as an Incentive Stock Option if you continue to provide services to the Company or an Affiliate as a Consultant or Director after your employment terminates or if you otherwise exercise your option more than three (3) months after the date your employment with the Company or an Affiliate terminates.

9. EXERCISE.

a. You may exercise the vested portion of your option (and the unvested portion of your option if your Grant Notice so permits) during its term by (i) delivering a Notice of Exercise (in a form designated by the Company) or completing such other documents and/or procedures designated by the Company for exercise and (ii) paying the exercise price and any applicable withholding taxes to the Company's Secretary, stock plan administrator, or such other person as the Company may designate, together with such additional documents as the Company may then require.

b. By exercising your option you agree that, as a condition to any exercise of your option, the Company may require you to enter into an arrangement providing for the payment by you to the Company of any tax withholding obligation of the Company arising by reason of (i) the exercise of your option, (ii) the lapse of any substantial risk of forfeiture to which the shares of Common Stock are subject at the time of exercise, or (iii) the disposition of shares of Common Stock acquired upon such exercise.

c. If your option is an Incentive Stock Option, by exercising your option you agree that you will notify the Company in writing within fifteen (15) days after the date of any disposition of any of the shares of the Common Stock issued upon exercise of your option that occurs within two (2) years after the Date of Grant or within one (1) year after such shares of Common Stock are transferred upon exercise of your option.

d. By accepting your option you agree that you will not sell, dispose of, transfer, make any short sale of, grant any option for the purchase of, or enter into any hedging or similar transaction with the same economic effect as a sale, any shares of Common Stock or other securities of the Company held by you, for a period of one hundred eighty (180) days following the effective date of a registration statement of the Company filed under the Securities Act or such longer period as the underwriters or the Company will request to facilitate compliance with FINRA Rule 2241 or NYSE Member Rule 472 or any successor or similar rules or regulation (the "***Lock-Up Period***"); *provided, however*, that nothing contained in this section will prevent the exercise of a repurchase option, if any, in favor of the Company during the Lock-Up Period. You further agree to execute and deliver such other agreements as may be reasonably requested by the Company or the underwriters that are consistent with the foregoing or that are necessary to give further effect thereto. In order to enforce the foregoing covenant, the Company may impose stop-transfer instructions with respect to your shares of Common Stock until the end of such period.

You also agree that any transferee of any shares of Common Stock (or other securities) of the Company held by you will be bound by this Section 9(d). The underwriters of the Company's stock are intended third party beneficiaries of this Section 9(d) and will have the right, power and authority to enforce the provisions hereof as though they were a party hereto.

10. TRANSFERABILITY. Except as otherwise provided in this Section 10, your option is not transferable, except by will or by the laws of descent and distribution, and is exercisable during your life only by you.

a. Certain Trusts. Upon receiving written permission from the Board or its duly authorized designee, you may transfer your option to a trust if you are considered to be the sole beneficial owner (determined under Section 671 of the Code and applicable state law) while the option is held in the trust. You and the trustee must enter into transfer and other agreements required by the Company.

b. Domestic Relations Orders. Upon receiving written permission from the Board or its duly authorized designee, and provided that you and the designated transferee enter into transfer and other agreements required by the Company, you may transfer your option pursuant to the terms of a domestic relations order, official marital settlement agreement or other divorce or separation instrument as permitted by Treasury Regulation 1.421-1(b)(2) that contains the information required by the Company to effectuate the transfer. You are encouraged to discuss the proposed terms of any division of this option with the Company prior to finalizing the domestic relations order or marital settlement agreement to help ensure the required information is contained within the domestic relations order or marital settlement agreement. If this option is an Incentive Stock Option, this option may be deemed to be a Nonstatutory Stock Option as a result of such transfer.

c. Beneficiary Designation. Upon receiving written permission from the Board or its duly authorized designee, you may, by delivering written notice to the Company, in a form approved by the Company and any broker designated by the Company to handle option exercises, designate a third party who, on your death, will thereafter be entitled to exercise this option and receive the Common Stock or other consideration resulting from such exercise. In the absence of such a designation, your executor or administrator of your estate will be entitled to exercise this option and receive, on behalf of your estate, the Common Stock or other consideration resulting from such exercise.

11. OPTION NOT A SERVICE CONTRACT. Your option is not an employment or service contract, and nothing in your option will be deemed to create in any way whatsoever any obligation on your part to continue in the employ of the Company or an Affiliate, or of the Company or an Affiliate to continue your employment. In addition, nothing in your option will obligate the Company or an Affiliate, their respective stockholders, boards of directors, officers or employees to continue any relationship that you might have as a Director or Consultant for the Company or an Affiliate.

12. WITHHOLDING OBLIGATIONS.

a. At the time you exercise your option, in whole or in part, and at any time thereafter as requested by the Company, you hereby authorize withholding from payroll and any other amounts payable to you, and otherwise agree to make adequate provision for (including by means of a "same day sale" pursuant to a program developed under Regulation T as promulgated by the Federal Reserve Board to the extent permitted by the Company), any sums required to satisfy the federal, state, local and foreign tax withholding obligations of the Company or an Affiliate, if any, which arise in connection with the exercise of your option.

b. If this option is a Nonstatutory Stock Option, then upon your request and subject to approval by the Company, and compliance with any applicable legal conditions or restrictions, the Company may withhold from fully vested shares of Common Stock otherwise issuable to you upon the exercise of your option a number of whole shares of Common Stock having a Fair Market Value, determined by the Company as of the date of exercise, not in excess of the maximum amount of tax required to be withheld by law (or such other amount as may be permitted while still avoiding classification of your option as a liability for financial accounting purposes). If the date of determination of any tax withholding obligation is deferred to a date later than the date of exercise of your option, share withholding pursuant to the preceding sentence shall not be permitted unless you make a proper and timely election under Section 83(b) of the Code, covering the aggregate number of

shares of Common Stock acquired upon such exercise with respect to which such determination is otherwise deferred, to accelerate the determination

of such tax withholding obligation to the date of exercise of your option. Notwithstanding the filing of such election, shares of Common Stock shall be withheld solely from fully vested shares of Common Stock determined as of the date of exercise of your option that are otherwise issuable to you upon such exercise. Any adverse consequences to you arising in connection with such share withholding procedure shall be your sole responsibility.

c. You may not exercise your option unless the tax withholding obligations of the Company and/or any Affiliate are satisfied. Accordingly, you may not be able to exercise your option when desired even though your option is vested, and the Company will have no obligation to issue a certificate for such shares of Common Stock or release such shares of Common Stock from any escrow provided for herein, if applicable, unless such obligations are satisfied.

13. TAX CONSEQUENCES. You hereby agree that the Company does not have a duty to design or administer the Plan or its other compensation programs in a manner that minimizes your tax liabilities. You will not make any claim against the Company, or any of its Officers, Directors, Employees or Affiliates related to tax liabilities arising from your option or your other compensation. In particular, you acknowledge that this option is exempt from Section 409A of the Code only if the exercise price per share specified in the Grant Notice is at least equal to the "fair market value" per share of the Common Stock on the Date of Grant and there is no other impermissible deferral of compensation associated with the option.

14. NOTICES. Any notices provided for in your option or the Plan will be given in writing (including electronically) and will be deemed effectively given upon receipt or, in the case of notices delivered by mail by the Company to you, five (5) days after deposit in the United States mail, postage prepaid, addressed to you at the last address you provided to the Company. The Company may, in its sole discretion, decide to deliver any documents related to participation in the Plan and this option by electronic means or to request your consent to participate in the Plan by electronic means. By accepting this option, you consent to receive such documents by electronic delivery and to participate in the Plan through an on-line or electronic system established and maintained by the Company or another third party designated by the Company.

15. GOVERNING PLAN DOCUMENT. Your option is subject to all the provisions of the Plan, the provisions of which are hereby made a part of your option, and is further subject to all interpretations, amendments, rules and regulations, which may from time to time be promulgated and adopted pursuant to the Plan. If there is any conflict between the provisions of your option and those of the Plan, the provisions of the Plan will control. In addition, your option (and any compensation paid or shares issued under your option) is subject to recoupment in accordance with The Dodd-Frank Wall Street Reform and Consumer Protection Act and any implementing regulations thereunder, any compensation recovery policy otherwise required by applicable law and any recoupment or clawback policy adopted by the Company (whether or not required by applicable law).

16. OTHER DOCUMENTS. You hereby acknowledge receipt of and the right to receive a document providing the information required by Rule 428(b)(1) promulgated under the Securities Act, which includes the Plan prospectus. In addition, you acknowledge receipt of the Company's policy permitting certain individuals to sell shares only during certain "window" periods and the Company's insider trading policy, in effect from time to time.

17. EFFECT ON OTHER EMPLOYEE BENEFIT PLANS. The value of this option will not be included as compensation, earnings, salaries, or other similar terms used when calculating your benefits under any employee benefit plan

sponsored by the Company or any Affiliate, except as such plan otherwise expressly provides. The Company expressly reserves its rights to amend, modify, or terminate any of the Company's or any Affiliate's employee benefit plans.

18. VOTING RIGHTS. You will not have voting or any other rights as a stockholder of the Company with respect to the shares to be issued pursuant to this option until such shares are issued to you. Upon such issuance, you will obtain full voting and other rights as a stockholder of the Company. Nothing contained in this option, and no action taken pursuant to its provisions, will create or be construed to create a trust of any kind or a fiduciary relationship between you and the Company or any other person.

19. SEVERABILITY. If all or any part of this Option Agreement or the Plan is declared by any court or governmental authority to be unlawful or invalid, such unlawfulness or invalidity will not invalidate any portion of this Option Agreement or the Plan not declared to be unlawful or invalid. Any Section of this Option Agreement (or part of such a Section) so declared to be unlawful or invalid shall, if possible, be construed in a manner which will give effect to the terms of such Section or part of a Section to the fullest extent possible while remaining lawful and valid.

20. MISCELLANEOUS.

a. The rights and obligations of the Company under your option will be transferable to any one or more persons or entities, and all covenants and agreements hereunder will inure to the benefit of, and be enforceable by the Company's successors and assigns.

b. You agree upon request to execute any further documents or instruments necessary or desirable in the sole determination of the Company to carry out the purposes or intent of your option.

c. You acknowledge and agree that you have reviewed your option in its entirety, have had an opportunity to obtain the advice of counsel prior to executing and accepting your option, and fully understand all provisions of your option.

d. This Option Agreement will be subject to all applicable laws, rules, and regulations, and to such approvals by any governmental agencies or national securities exchanges as may be required.

e. All obligations of the Company under the Plan and this Option Agreement will be binding on any successor to the Company, whether the existence of such successor is the result of a direct or indirect purchase, merger, consolidation, or otherwise, of all or substantially all of the business and/or assets of the Company.

* * *

This Option Agreement will be deemed to be signed by you upon the signing by you of the Stock Option Grant Notice to which it is attached.

STANDARD FORM

ATTACHMENT II

2019 EQUITY INCENTIVE PLAN

STANDARD FORM

ATTACHMENT III

NOTICE OF EXERCISE

Bellicum Pharmaceuticals, Inc.

Life Sciences Plaza

2130 West Holcombe Boulevard, Suite 850

Houston, Texas 77030 Date of Exercise: _____

This constitutes notice to Bellicum Pharmaceuticals, Inc. (the "***Company***") under my stock option that I elect to purchase the below number of shares of Common Stock of the Company (the "***Shares***") for the price set forth below.

Type of option (check one):	Incentive o	Nonstatutory o
Stock option dated:	_____	_____
Number of Shares as to which option is exercised:	_____	_____
Certificates to be issued in name of:	_____	_____
Total exercise price:	$_____	$_____
Cash payment delivered herewith:	$_____	$_____
[Value of _____ Shares delivered herewith:	$_____	$_____]
[Value of _____ Shares pursuant to net exercise:	$_____	$_____]
[Regulation T Program (cashless exercise):	$_____	$_____]

[1] Shares must meet the public trading requirements set forth in the option. Shares must be valued in accordance with the terms of the option being exercised, and must be owned free and clear of any liens, claims, encumbrances or security interests. Certificates must be endorsed or accompanied by an executed assignment separate from certificate.

[2] The option must be a Nonstatutory Stock Option, and Bellicum Pharmaceuticals, Inc. must have established net exercise procedures at the time of exercise, in order to utilize this payment method.

[3] Shares must meet the public trading requirements set forth in the option.

STANDARD FORM

By this exercise, I agree (i) to provide such additional documents as you may require pursuant to the terms of the Bellicum Pharmaceuticals, Inc. 2019 Equity Incentive Plan, (ii) to provide for the payment by me to you (in the manner designated by you) of your withholding obligation, if any, relating to the exercise of this option, and (iii) if this exercise relates to an incentive stock option, to notify you in writing within fifteen (15) days after the date of any disposition of any of the Shares issued upon exercise of this option that occurs within two (2) years after the date of grant of this option or within one (1) year after such Shares are issued upon exercise of this option.

Very truly yours,

_____

BELLICUM PHARMACEUTICALS, INC.
STOCK OPTION GRANT NOTICE
(2019 EQUITY INCENTIVE PLAN)

Bellicum Pharmaceuticals, Inc. (the "***Company***"), pursuant to its 2019 Equity Incentive Plan (the "***Plan***"), hereby grants to Optionholder an option to purchase the number of shares of the Company's Common Stock set forth below. This option is subject to all of the terms and conditions as set forth in this notice, in the Option Agreement, the Plan and the Notice of Exercise, all of which are attached hereto and incorporated herein in their entirety. Capitalized terms not explicitly defined herein but defined in the Plan or the Option Agreement will have the same definitions as in the Plan or the Option Agreement. If there is any conflict between the terms in this notice and the Plan, the terms of the Plan will control.

Optionholder:	_____
Date of Grant:	_____
Number of Shares Subject to Option:	_____
Exercise Price (Per Share):	_____
Total Exercise Price:	_____
Expiration Date:	_____

Type of Grant: x Nonstatutory Stock Option

Exercise Schedule: x Same as Vesting Schedule

Vesting Schedule: [***For initial grants****:* The shares shall vest with respect to one-third of the shares on the one-year anniversary of the Date of Grant, and with respect to the remaining two-thirds of the shares in a series of twenty-four (24) successive equal monthly installments over the two-year period following such one-year anniversary of the Date of Grant, subject to Optionholder's Continuous Service as of each such date and the potential acceleration provisions set forth in Section 9 of the Option Agreement**] [***For annual grants:*** The shares shall vest in full on the one-year anniversary of the Date of Grant, subject to Optionholder's Continuous Service as of each such date and the potential acceleration provisions set forth in Section 9 of the Option Agreement]

Payment: By one or a combination of the following items (described in the Option Agreement):

- x By cash, check, bank draft or money order payable to the Company
- x Pursuant to a Regulation T Program if the shares are publicly traded
- x By delivery of already-owned shares if the shares are publicly traded
- x Subject to the Company's consent at the time of exercise, by a "net exercise" arrangement

Additional Terms/Acknowledgements: Optionholder acknowledges receipt of, and understands and agrees to, this Stock Option Grant Notice, the Option Agreement and the Plan. Optionholder acknowledges and agrees that this Stock Option Grant Notice and the Option Agreement may not be modified, amended or revised except as provided in the Plan. Optionholder further acknowledges that as of the Date of Grant, this Stock Option Grant Notice, the Option Agreement, and the Plan set forth the entire understanding between Optionholder and the Company regarding this option award and supersede all prior oral and written agreements, promises and/or representations on that subject with the exception of (i) options previously granted and delivered to Optionholder, (ii) any compensation recovery policy that is adopted by the Company or is otherwise required by applicable law and (iii) any written employment or severance arrangement that would provide for vesting acceleration of this option upon the terms and conditions set forth therein. By accepting this option, Optionholder consents to receive such documents by electronic delivery and to participate in the Plan through an on-line or electronic system established and maintained by the Company or another third party designated by the Company.

BELLICUM PHARMACEUTICALS, INC.	**OPTIONHOLDER:**
By:_____ Signature	_____ Signature
Title:_____	
Date:_____	Date:_____

ATTACHMENTS: Option Agreement, 2019 Equity Incentive Plan and Notice of Exercise

ATTACHMENT I
BELLICUM PHARMACEUTICALS, INC.
2019 EQUITY INCENTIVE PLAN

OPTION AGREEMENT
(NONSTATUTORY STOCK OPTION)

Pursuant to your Stock Option Grant Notice ("***Grant Notice***") and this Option Agreement, Bellicum Pharmaceuticals, Inc.(the "***Company***") has granted you an option under its 2019 Equity Incentive Plan (the "***Plan***") to purchase the number of shares of the Company's Common Stock indicated in your Grant Notice at the exercise price indicated in your Grant Notice. The option is granted to you effective as of the date of grant set forth in the Grant Notice (the "***Date of Grant***"). If there is any conflict between the terms in this Option Agreement and the Plan, the terms of the Plan will control. Capitalized terms not explicitly defined in this Option Agreement or in the Grant Notice but defined in the Plan will have the same definitions as in the Plan.

The details of your option, in addition to those set forth in the Grant Notice and the Plan, are as follows:

VESTING. Subject to the provisions contained herein, your option will vest as provided in your Grant Notice. Vesting will cease upon the termination of your Continuous Service.

NUMBER OF SHARES AND EXERCISE PRICE. The number of shares of Common Stock subject to your option and your exercise price per share in your Grant Notice will be adjusted for Capitalization Adjustments.

METHOD OF PAYMENT. You must pay the full amount of the exercise price for the shares you wish to exercise. You may pay the exercise price in cash or by check, bank draft or money order payable to the Company or in any other manner ***permitted by your Grant Notice,*** which may include one or more of the following:

Provided that at the time of exercise the Common Stock is publicly traded, pursuant to a program developed under Regulation T as promulgated by the Federal Reserve Board that, prior to the issuance of Common Stock, results in either the receipt of cash (or check) by the Company or the receipt of irrevocable instructions to pay the aggregate exercise price to the Company from the sales proceeds. This manner of payment is also known as a "broker-assisted exercise", "same day sale", or "sell to cover".

Provided that at the time of exercise the Common Stock is publicly traded, by delivery to the Company (either by actual delivery or attestation) of already-owned shares of Common Stock that are owned free and clear of any liens, claims, encumbrances or security interests, and that are valued at Fair Market Value on the date of exercise. "Delivery" for these purposes, in the sole discretion of the Company at the time you exercise your option, will include delivery to the Company of your attestation of ownership of such shares of Common Stock in a form approved by the Company. You may not exercise your option by delivery to the Company of Common Stock if doing so would violate the provisions of any law, regulation or agreement restricting the redemption of the Company's stock.

Subject to the consent of the Company at the time of exercise, by a "net exercise" arrangement pursuant to which the Company will reduce the number of shares of Common Stock issued upon exercise of your option by the largest whole number of shares with a Fair Market Value that does not exceed the aggregate exercise price. You must pay any remaining balance of the aggregate exercise price not satisfied by the "net exercise" in cash or other permitted form of payment. Shares of Common Stock will no longer be outstanding under your option and will not be exercisable thereafter if those shares (i) are used to pay the exercise price pursuant to the "net exercise," (ii) are delivered to you as a result of such exercise, and (iii) are withheld to satisfy your tax withholding obligations.

WHOLE SHARES. You may exercise your option only for whole shares of Common Stock.

SECURITIES LAW COMPLIANCE. In no event may you exercise your option unless the shares of Common Stock issuable upon exercise are then registered under the Securities Act or, if not registered, the Company has determined that your exercise and the issuance of the shares would be exempt from the registration requirements of the Securities Act. The exercise of your option also must comply with all other applicable laws and regulations governing your option, and you may not exercise your option if the Company determines that such exercise would not be in material compliance with such laws and regulations (including any restrictions on exercise required for compliance with Treas. Reg. 1.401(k)-1(d)(3), if applicable).

TERM. You may not exercise your option before the Date of Grant or after the expiration of the option's term. The term of your option expires, subject to the provisions of Section 5(h) of the Plan, upon the earliest of the following:

immediately upon the termination of your Continuous Service for Cause;

twelve (12) months after the termination of your Continuous Service for any reason other than Cause, your Disability or your death (except as otherwise provided in Section 6(d) below); *provided, however,* that if during any part of such twelve (12) month period your option is not exercisable solely because of the condition set forth in the section above relating to "Securities Law Compliance," your option will not expire until the earlier of the Expiration Date or until it has been exercisable for an aggregate period of twelve (12) months after the termination of your Continuous Service; *provided further,* if during any part of such twelve (12) month period, the sale of any Common Stock received upon exercise of your option would violate the Company's insider trading policy, then your option will not expire until the earlier of the Expiration Date or until it has been exercisable for an aggregate period of three (3) months after the termination of your Continuous Service during which the sale of the Common Stock received upon exercise of your option would not be in violation of the Company's insider trading policy;

twelve (12) months after the termination of your Continuous Service due to your Disability (except as otherwise provided in Section 6(d)) below;

eighteen (18) months after your death if you die either during your Continuous Service or within three (3) months after your Continuous Service terminates for any reason other than Cause;

the Expiration Date indicated in your Grant Notice; or

the day before the tenth (10th) anniversary of the Date of Grant.

EXERCISE.

You may exercise the vested portion of your option during its term by (i) delivering a Notice of Exercise (in a form designated by the Company) or completing such other documents and/or procedures designated by the Company for exercise and (ii) paying the exercise price and any applicable withholding taxes to the Company's Secretary, stock plan administrator, or such other person as the Company may designate, together with such additional documents as the Company may then require.

By exercising your option you agree that, as a condition to any exercise of your option, the Company may require you to enter into an arrangement providing for the payment by you to the Company of any tax withholding obligation of the Company arising by reason of (i) the exercise of your option, (ii) the lapse of any substantial risk of forfeiture to which the shares of Common Stock are subject at the time of exercise, or (iii) the disposition of shares of Common Stock acquired upon such exercise.

By accepting your option you agree that you will not sell, dispose of, transfer, make any short sale of, grant any option for the purchase of, or enter into any hedging or similar transaction with the same economic effect as a sale, any shares of Common Stock or other securities of the Company held by you, for a period of one hundred eighty (180) days following the effective date of a registration statement of the Company filed under the Securities Act or such longer period as the underwriters or the Company will request to facilitate compliance with FINRA Rule 2241 or NYSE Member Rule 472 or any successor or similar rules or regulation (the "***Lock-Up Period***"); *provided*, *however*, that nothing contained in this section will prevent the exercise of a repurchase option, if any, in favor of the Company during the Lock-Up Period. You further agree to execute and deliver such other agreements as may be reasonably requested by the Company or the underwriters that are consistent with the foregoing or that are necessary to give further effect thereto. In order to enforce the foregoing covenant, the Company may impose stop-transfer instructions with respect to your shares of Common Stock until the end of such period. You also agree that any transferee of any shares of Common Stock (or other securities) of the Company held by you will be bound by this Section 7(c). The underwriters of the Company's stock are intended third party beneficiaries of this Section 7(c) and will have the right, power and authority to enforce the provisions hereof as though they were a party hereto.

TRANSFERABILITY. Except as otherwise provided in this Section 8, your option is not transferable, except by will or by the laws of descent and distribution, and is exercisable during your life only by you.

Certain Trusts. Upon receiving written permission from the Board or its duly authorized designee, you may transfer your option to a trust if you are considered to be the sole beneficial owner (determined under Section 671 of the Code and applicable state law) while the option is held in the trust. You and the trustee must enter into transfer and other agreements required by the Company.

Domestic Relations Orders. Upon receiving written permission from the Board or its duly authorized designee, and provided that you and the designated transferee enter into transfer and other agreements required by the Company, you may transfer your option pursuant to the terms of a domestic relations order, official marital settlement agreement or other divorce or separation instrument as permitted by Treasury Regulation 1.421-1(b)(2) that contains the

information required by the Company to effectuate the transfer. You are encouraged to discuss the proposed terms of any division of this option with the Company prior

to finalizing the domestic relations order or marital settlement agreement to help ensure the required information is contained within the domestic relations order or marital settlement agreement.

Beneficiary Designation. Upon receiving written permission from the Board or its duly authorized designee, you may, by delivering written notice to the Company, in a form approved by the Company and any broker designated by the Company to handle option exercises, designate a third party who, on your death, will thereafter be entitled to exercise this option and receive the Common Stock or other consideration resulting from such exercise. In the absence of such a designation, your executor or administrator of your estate will be entitled to exercise this option and receive, on behalf of your estate, the Common Stock or other consideration resulting from such exercise.

CHANGE IN CONTROL.

If a Change in Control occurs and as of immediately prior to the effective time of such Change in Control your Continuous Service has not terminated, then, as of the effective time of the Change in Control, the vesting and exercisability of your option will be accelerated in full.

If any payment or benefit you would receive from the Company or otherwise in connection with a Change in Control or other similar transaction (a "***280G Payment***") would (i) constitute a "parachute payment" within the meaning of Section 280G of the Code, and (ii) but for this sentence, be subject to the excise tax imposed by Section 4999 of the Code (the "***Excise Tax***"), then any such 280G Payment (a "***Payment***") shall be equal to the Reduced Amount. The "***Reduced Amount***" shall be either (x) the largest portion of the Payment that would result in no portion of the Payment (after reduction) being subject to the Excise Tax or (y) the largest portion, up to and including the total, of the Payment, whichever amount (i.e., the amount determined by clause (x) or by clause (y)), after taking into account all applicable federal, state and local employment taxes, income taxes, and the Excise Tax (all computed at the highest applicable marginal rate), results in your receipt, on an after-tax basis, of the greater economic benefit notwithstanding that all or some portion of the Payment may be subject to the Excise Tax. If a reduction in a Payment is required pursuant to the preceding sentence and the Reduced Amount is determined pursuant to clause (x) of the preceding sentence, the reduction shall occur in the manner (the "***Reduction Method***") that results in the greatest economic benefit for you. If more than one method of reduction will result in the same economic benefit, the items so reduced will be reduced pro rata (the "***Pro Rata Reduction Method***").

Notwithstanding the foregoing, if the Reduction Method or the Pro Rata Reduction Method would result in any portion of the Payment being subject to taxes pursuant to Section 409A of the Code that would not otherwise be subject to taxes pursuant to Section 409A of the Code, then the Reduction Method and/or the Pro Rata Reduction Method, as the case may be, shall be modified so as to avoid the imposition of taxes pursuant to Section 409A of the Code as follows: (A) as a first priority, the modification shall preserve to the greatest extent possible, the greatest economic benefit for you as determined on an after-tax basis; (B) as a second priority, Payments that are contingent on future events (e.g., being terminated without cause), shall be reduced (or eliminated) before Payments that are not contingent on future events; and (C) as a third priority, Payments that are "deferred compensation" within the meaning of Section 409A of the Code shall be reduced (or eliminated) before Payments

that are not deferred compensation within the meaning of Section 409A of the Code.

Unless you and the Company agree on an alternative accounting firm, the accounting firm engaged by the Company for

general tax compliance purposes as of the day prior to the effective date of the change of control transaction triggering the Payment shall perform the foregoing calculations. If the accounting firm so engaged by the Company is serving as accountant or auditor for the individual, entity or group effecting the change of control transaction, the Company shall appoint a nationally recognized accounting firm to make the determinations required hereunder. The Company shall bear all expenses with respect to the determinations by such accounting firm required to be made hereunder. The Company shall use commercially reasonable efforts to cause the accounting firm engaged to make the determinations hereunder to provide its calculations, together with detailed supporting documentation, to you and the Company within fifteen (15) calendar days after the date on which your right to a 280G Payment becomes reasonably likely to occur (if requested at that time by you or the Company) or such other time as requested by you or the Company.

If you receive a Payment for which the Reduced Amount was determined pursuant to clause (x) of the first paragraph of this Section 9(b) and the Internal Revenue Service determines thereafter that some portion of the Payment is subject to the Excise Tax, you shall promptly return to the Company a sufficient amount of the Payment (after reduction pursuant to clause (x) of the first paragraph of this Section 9(b) so that no portion of the remaining Payment is subject to the Excise Tax. For the avoidance of doubt, if the Reduced Amount was determined pursuant to clause (y) in the first paragraph of this Section 9(b), you shall have no obligation to return any portion of the Payment pursuant to the preceding sentence.

OPTION NOT A SERVICE CONTRACT. Your option is not an employment or service contract, and nothing in your option will be deemed to create in any way whatsoever any obligation on your part to continue in the employ of the Company or an Affiliate, or of the Company or an Affiliate to continue your employment. In addition, nothing in your option will obligate the Company or an Affiliate, their respective stockholders, boards of directors, officers or employees to continue any relationship that you might have as a Director or Consultant for the Company or an Affiliate.

WITHHOLDING OBLIGATIONS.

At the time you exercise your option, in whole or in part, and at any time thereafter as requested by the Company, you hereby authorize withholding from payroll and any other amounts payable to you, and otherwise agree to make adequate provision for (including by means of a “same day sale” pursuant to a program developed under Regulation T as promulgated by the Federal Reserve Board to the extent permitted by the Company), any sums required to satisfy the federal, state, local and foreign tax withholding obligations of the Company or an Affiliate, if any, which arise in connection with the exercise of your option.

Upon your request and subject to approval by the Company, and compliance with any applicable legal conditions or restrictions, the Company may withhold from fully vested shares of Common Stock otherwise issuable to you upon the exercise of your option a number of whole shares of Common Stock having a Fair Market Value, determined by the Company as of the date of exercise, not in excess of the maximum amount of tax required to be withheld by law (or such other amount as may be permitted while still avoiding classification of your option as a liability for financial accounting purposes). If the date of determination of any tax withholding obligation is deferred to a date later than the date of exercise of your option, share withholding pursuant to the preceding sentence shall not be permitted unless you make a proper and timely election under Section 83(b) of the

Code, covering the aggregate number of shares of Common Stock acquired upon such exercise with respect to which such determination is otherwise deferred, to accelerate the determination of such tax withholding obligation to the date of exercise of

your option. Notwithstanding the filing of such election, shares of Common Stock shall be withheld solely from fully vested shares of Common Stock determined as of the date of exercise of your option that are otherwise issuable to you upon such exercise. Any adverse consequences to you arising in connection with such share withholding procedure shall be your sole responsibility.

You may not exercise your option unless the tax withholding obligations of the Company and/or any Affiliate are satisfied. Accordingly, you may not be able to exercise your option when desired even though your option is vested, and the Company will have no obligation to issue a certificate for such shares of Common Stock or release such shares of Common Stock from any escrow provided for herein, if applicable, unless such obligations are satisfied.

TAX CONSEQUENCES. You hereby agree that the Company does not have a duty to design or administer the Plan or its other compensation programs in a manner that minimizes your tax liabilities. You will not make any claim against the Company, or any of its Officers, Directors, Employees or Affiliates related to tax liabilities arising from your option or your other compensation. In particular, you acknowledge that this option is exempt from Section 409A of the Code only if the exercise price per share specified in the Grant Notice is at least equal to the “fair market value” per share of the Common Stock on the Date of Grant and there is no other impermissible deferral of compensation associated with the option.

NOTICES. Any notices provided for in your option or the Plan will be given in writing (including electronically) and will be deemed effectively given upon receipt or, in the case of notices delivered by mail by the Company to you, five (5) days after deposit in the United States mail, postage prepaid, addressed to you at the last address you provided to the Company. The Company may, in its sole discretion, decide to deliver any documents related to participation in the Plan and this option by electronic means or to request your consent to participate in the Plan by electronic means. By accepting this option, you consent to receive such documents by electronic delivery and to participate in the Plan through an on-line or electronic system established and maintained by the Company or another third party designated by the Company.

GOVERNING PLAN DOCUMENT. Your option is subject to all the provisions of the Plan, the provisions of which are hereby made a part of your option, and is further subject to all interpretations, amendments, rules and regulations, which may from time to time be promulgated and adopted pursuant to the Plan. If there is any conflict between the provisions of your option and those of the Plan, the provisions of the Plan will control. In addition, your option (and any compensation paid or shares issued under your option) is subject to recoupment in accordance with The Dodd-Frank Wall Street Reform and Consumer Protection Act and any implementing regulations thereunder, any compensation recovery policy otherwise required by applicable law and any recoupment or clawback policy adopted by the Company (whether or not required by applicable law).

OTHER DOCUMENTS. You hereby acknowledge receipt of and the right to receive a document providing the information required by Rule 428(b)(1) promulgated under the Securities Act, which includes the Plan prospectus. In addition,

you acknowledge receipt of the Company's policy permitting certain individuals to sell shares only during certain "window" periods and the Company's insider trading policy, in effect from time to time.

EFFECT ON OTHER EMPLOYEE BENEFIT PLANS. The value of this option will not be included as compensation, earnings, salaries, or other similar terms used when calculating your benefits under any employee benefit plan sponsored by the Company or any Affiliate, except as such plan otherwise expressly provides. The Company expressly reserves its rights to amend, modify, or terminate any of the Company's or any Affiliate's employee benefit plans.

VOTING RIGHTS. You will not have voting or any other rights as a stockholder of the Company with respect to the shares to be issued pursuant to this option until such shares are issued to you. Upon such issuance, you will obtain full voting and other rights as a stockholder of the Company. Nothing contained in this option, and no action taken pursuant to its provisions, will create or be construed to create a trust of any kind or a fiduciary relationship between you and the Company or any other person.

SEVERABILITY. If all or any part of this Option Agreement or the Plan is declared by any court or governmental authority to be unlawful or invalid, such unlawfulness or invalidity will not invalidate any portion of this Option Agreement or the Plan not declared to be unlawful or invalid. Any Section of this Option Agreement (or part of such a Section) so declared to be unlawful or invalid shall, if possible, be construed in a manner which will give effect to the terms of such Section or part of a Section to the fullest extent possible while remaining lawful and valid.

MISCELLANEOUS.

The rights and obligations of the Company under your option will be transferable to any one or more persons or entities, and all covenants and agreements hereunder will inure to the benefit of, and be enforceable by the Company's successors and assigns.

You agree upon request to execute any further documents or instruments necessary or desirable in the sole determination of the Company to carry out the purposes or intent of your option.

You acknowledge and agree that you have reviewed your option in its entirety, have had an opportunity to obtain the advice of counsel prior to executing and accepting your option, and fully understand all provisions of your option.

This Option Agreement will be subject to all applicable laws, rules, and regulations, and to such approvals by any governmental agencies or national securities exchanges as may be required.

All obligations of the Company under the Plan and this Option Agreement will be binding on any successor to the Company, whether the existence of such successor is the result of a direct or indirect purchase, merger, consolidation, or otherwise, of all or substantially all of the business and/or assets of the Company.

* * *

This Option Agreement will be deemed to be signed by you upon the signing by you of the Stock Option Grant Notice to which it is attached.

ATTACHMENT II

2019 EQUITY INCENTIVE PLAN

ATTACHMENT III

NOTICE OF EXERCISE

Bellicum Pharmaceuticals, Inc.

2130 West Holcombe Boulevard, Suite 800

Houston, Texas 77030 Date of Exercise: _____

This constitutes notice to Bellicum Pharmaceuticals, Inc. (the "***Company***") under my stock option that I elect to purchase the below number of shares of Common Stock of the Company (the "***Shares***") for the price set forth below.

Type of option (check one):	Nonstatutory x
Stock option dated:	_____
Number of Shares as to which option is exercised:	_____
Certificates to be issued in name of:	_____
Total exercise price:	$_____
Cash payment delivered herewith:	$_____
[Value of _____ Shares delivered herewith:	$_____]
[Value of _____ Shares pursuant to net exercise[2]:	$_____]
[Regulation T Program (cashless exercise[3]):	$_____]

[1] Shares must meet the public trading requirements set forth in the option. Shares must be valued in accordance with the terms of the option being exercised, and must be owned free and clear of any liens, claims, encumbrances or security interests. Certificates must be endorsed or accompanied by an executed assignment separate from certificate.

[2] Bellicum Pharmaceuticals, Inc. must have established net exercise procedures at the time of exercise, in order to utilize this payment method.

[3] Shares must meet the public trading requirements set forth in the option.

By this exercise, I agree (i) to provide such additional documents as you may require pursuant to the terms of the Bellicum Pharmaceuticals, Inc. 2019 Equity Incentive Plan and (ii) to provide for the payment by me to you (in the manner designated by you) of your withholding obligation, if any, relating to the exercise of this option.

Very truly yours,

_____

BELLICUM PHARMACEUTICALS, INC.
STOCK OPTION GRANT NOTICE
(2019 EQUITY INCENTIVE PLAN)

Bellicum Pharmaceuticals, Inc. (the "***Company***"), pursuant to its 2019 Equity Incentive Plan (the "***Plan***"), hereby grants to Optionholder an option to purchase the number of shares of the Company's Common Stock set forth below. This option is subject to all of the terms and conditions as set forth in this notice, in the Option Agreement, the Plan and the Notice of Exercise, all of which are attached hereto and incorporated herein in their entirety. Capitalized terms not explicitly defined herein but defined in the Plan or the Option Agreement will have the same definitions as in the Plan or the Option Agreement. If there is any conflict between the terms in this notice and the Plan, the terms of the Plan will control.

Optionholder:	_____
Date of Grant:	_____
Vesting Commencement Date:	_____
Number of Shares Subject to Option:	_____
Exercise Price (Per Share):	_____
Total Exercise Price:	_____
Expiration Date:	_____

Type of Grant: o Incentive Stock Option o Nonstatutory Stock Option

Exercise Schedule: x Same as Vesting Schedule o Early Exercise Permitted

Vesting Schedule: **[**One-fourth **(**1/4th) of the shares vest one year after the later of the (i) Vesting Commencement Date and (ii) Date of Grant; the balance of the shares vest in a series of thirty-six (36) successive equal monthly installments measured from the first anniversary of the Vesting Commencement Date, subject to Optionholder's Continuous Service as of each such date and the potential acceleration provisions set forth in Section 11 of the Option Agreement**]**

Payment: By one or a combination of the following items (described in the Option Agreement):

x By cash, check, bank draft or money order payable to the Company

x Pursuant to a Regulation T Program if the shares are publicly traded

x By delivery of already-owned shares if the shares are publicly traded

x If and only to the extent this option is a Nonstatutory Stock Option, and subject to the Company's consent at the time of exercise, by a "net exercise" arrangement

Additional Terms/Acknowledgements: Optionholder acknowledges receipt of, and understands and agrees to, this Stock Option Grant Notice, the Option Agreement and the Plan. Optionholder acknowledges and agrees that this Stock Option Grant Notice and the Option Agreement may not be modified, amended or revised except as provided in the Plan. Optionholder further acknowledges that as of the Date of Grant, this Stock Option Grant Notice, the Option Agreement, and the Plan set forth the entire understanding between Optionholder and the Company regarding this option award and supersede all prior oral and written agreements, promises and/or representations on that subject with the exception of (i) options previously granted and delivered to Optionholder, (ii) any compensation recovery policy that is adopted by the Company or is otherwise required by applicable law and (iii) any written employment or severance arrangement that would provide for vesting acceleration of this option upon the terms and conditions set forth therein. By accepting this option, Optionholder consents to receive such documents by electronic delivery and to participate in the Plan through an on-line or electronic system established and maintained by the Company or another third party designated by the Company.

BELLICUM PHARMACEUTICALS, INC.	**OPTIONHOLDER:**
By:_____ Signature	_____ Signature
Title:_____	
Date:_____	Date:_____

ATTACHMENTS: Option Agreement, 2019 Equity Incentive Plan and Notice of Exercise

ATTACHMENT I
BELLICUM PHARMACEUTICALS, INC.
2019 EQUITY INCENTIVE PLAN
OPTION AGREEMENT
(INCENTIVE STOCK OPTION OR NONSTATUTORY STOCK OPTION)

Pursuant to your Stock Option Grant Notice ("***Grant Notice***") and this Option Agreement, Bellicum Pharmaceuticals, Inc.(the "***Company***") has granted you an option under its 2019 Equity Incentive Plan (the "***Plan***") to purchase the number of shares of the Company's Common Stock indicated in your Grant Notice at the exercise price indicated in your Grant Notice. The option is granted to you effective as of the date of grant set forth in the Grant Notice (the "***Date of Grant***"). If there is any conflict between the terms in this Option Agreement and the Plan, the terms of the Plan will control. Capitalized terms not explicitly defined in this Option Agreement or in the Grant Notice but defined in the Plan will have the same definitions as in the Plan.

The details of your option, in addition to those set forth in the Grant Notice and the Plan, are as follows:

1. VESTING. Subject to the provisions contained herein, your option will vest as provided in your Grant Notice. Vesting will cease upon the termination of your Continuous Service.

2. NUMBER OF SHARES AND EXERCISE PRICE. The number of shares of Common Stock subject to your option and your exercise price per share in your Grant Notice will be adjusted for Capitalization Adjustments.

3. EXERCISE RESTRICTION FOR NON-EXEMPT EMPLOYEES. If you are an Employee eligible for overtime compensation under the Fair Labor Standards Act of 1938, as amended (that is, a "***Non-Exempt Employee***"), and except as otherwise provided in the Plan, you may not exercise your option until you have completed at least six (6) months of Continuous Service measured from the Date of Grant, even if you have already been an employee for more than six (6) months. Consistent with the provisions of the Worker Economic Opportunity Act, you may exercise your option as to any vested portion prior to such six (6) month anniversary in the case of (i) your death or disability, (ii) a Corporate Transaction in which your option is not assumed, continued or substituted, (iii) a Change in Control or (iv) your termination of Continuous Service on your "retirement" (as defined in the Company's benefit plans).

4. EXERCISE PRIOR TO VESTING ("EARLY EXERCISE"). If permitted in your Grant Notice (*i.e.*, the "Exercise Schedule" indicates "Early Exercise Permitted") and subject to the provisions of your option, you may elect at any time that is both (i) during the period of your Continuous Service and (ii) during the term of your option, to exercise all or part of your option, including the unvested portion of your option; *provided, however,* that:

a. a partial exercise of your option will be deemed to cover first vested shares of Common Stock and then the earliest vesting installment of unvested shares of Common Stock;

b. any shares of Common Stock so purchased from installments that have not vested as of the date of exercise will be subject to the purchase option in favor of the Company as described in the Company's form of Early Exercise Stock Purchase Agreement;

c. you will enter into the Company's form of Early Exercise Stock Purchase Agreement with a vesting schedule that will result in the same vesting as if no early exercise had occurred; and

d. if your option is an Incentive Stock Option, then, to the extent that the aggregate Fair Market Value (determined at the Date of Grant) of the shares of Common Stock with respect to which your option plus all other Incentive Stock Options you hold are exercisable for the first time by you during any calendar year (under all plans of the Company and its Affiliates) exceeds one hundred thousand dollars ($100,000), your option(s) or portions thereof that exceed such limit (according to the order in which they were granted) will be treated as Nonstatutory Stock Options.

5. METHOD OF PAYMENT. You must pay the full amount of the exercise price for the shares you wish to exercise. You may pay the exercise price in cash or by check, bank draft or money order payable to the Company or in any other manner ***permitted by your Grant Notice,*** which may include one or more of the following:

a. Provided that at the time of exercise the Common Stock is publicly traded, pursuant to a program developed under Regulation T as promulgated by the Federal Reserve Board that, prior to the issuance of Common Stock, results in either the receipt of cash (or check) by the Company or the receipt of irrevocable instructions to pay the aggregate exercise price to the Company from the sales proceeds. This manner of payment is also known as a "broker-assisted exercise", "same day sale", or "sell to cover".

b. Provided that at the time of exercise the Common Stock is publicly traded, by delivery to the Company (either by actual delivery or attestation) of already-owned shares of Common Stock that are owned free and clear of any liens, claims, encumbrances or security interests, and that are valued at Fair Market Value on the date of exercise. "Delivery" for these purposes, in the sole discretion of the Company at the time you exercise your option, will include delivery to the Company of your attestation of ownership of such shares of Common Stock in a form approved by the Company. You may not exercise your option by delivery to the Company of Common Stock if doing so would violate the provisions of any law, regulation or agreement restricting the redemption of the Company's stock.

c. If this option is a Nonstatutory Stock Option, subject to the consent of the Company at the time of exercise, by a "net exercise" arrangement pursuant to which the Company will reduce the number of shares of Common Stock issued upon exercise of your option by the largest whole number of shares with a Fair Market Value that does not exceed the aggregate exercise price. You must pay any remaining balance of the aggregate exercise price not satisfied by the "net exercise" in cash or other permitted form of payment. Shares of Common Stock will no longer be outstanding under your option and will not be exercisable thereafter if those shares (i) are used to pay the exercise price pursuant to the "net exercise," (ii) are delivered to you as a result of such exercise, and (iii) are withheld to satisfy your tax withholding obligations.

6. WHOLE SHARES. You may exercise your option only for whole shares of Common Stock.

7. SECURITIES LAW COMPLIANCE. In no event may you exercise your option unless the shares of Common Stock issuable upon exercise are then registered under the Securities Act or, if not registered, the Company has determined that your exercise and the issuance of the shares would be exempt from the registration requirements of the Securities Act. The exercise of your option also must comply with all other applicable laws and regulations governing your option, and you may not exercise your option if the Company determines that such exercise would not be in material compliance with such laws and regulations (including any restrictions on exercise required for compliance with Treas. Reg. 1.401(k)-1(d)(3), if applicable).

8. TERM. You may not exercise your option before the Date of Grant or after the expiration of the option's term. The term of your option expires, subject to the provisions of Section 5(h) of the Plan, upon the earliest of the following:

a. immediately upon the termination of your Continuous Service for Cause;

b. three (3) months after the termination of your Continuous Service for any reason other than Cause, your Disability or your death (except as otherwise provided in Section 8(d) below); *provided, however,* that if during any part of such three (3) month period your option is not exercisable solely because of the condition set forth in the section above relating to "Securities Law Compliance," your option will not expire until the earlier of the Expiration Date or until it has been exercisable for an aggregate period of three (3) months after the termination of your Continuous Service; *provided further,* if during any part of such three (3) month period, the sale of any Common Stock received upon exercise of your option would violate the Company's insider trading policy, then your option will not expire until the earlier of the Expiration Date or until it has been exercisable for an aggregate period of three (3) months after the termination of your Continuous Service during which the sale of the Common Stock received upon exercise of your option would not be in violation of the Company's insider trading policy. Notwithstanding the foregoing, if (i) you are a Non-Exempt Employee, (ii) your Continuous Service terminates within six (6) months after the Date of Grant, and (iii) you have vested in a portion of your option at the time of your termination of Continuous Service, your option will not expire until the earlier of (x) the later of (A) the date that is seven (7) months after the Date of Grant, and (B) the date that is three (3) months after the termination of your Continuous Service, and (y) the Expiration Date;

c. twelve (12) months after the termination of your Continuous Service due to your Disability (except as otherwise provided in Section 8(d)) below;

d. eighteen (18) months after your death if you die either during your Continuous Service or within three (3) months after your Continuous Service terminates for any reason other than Cause;

e. the Expiration Date indicated in your Grant Notice; or

f. the day before the tenth (10th) anniversary of the Date of Grant.

If your option is an Incentive Stock Option, note that to obtain the federal income tax advantages associated with an Incentive Stock Option, the Code requires that at all times beginning on the Date of Grant and ending on the day three (3) months before the date of your option's exercise, you must be an employee of the Company or an Affiliate, except in the event

of your death or Disability. The Company has provided for extended exercisability of your option under certain circumstances for your benefit but cannot guarantee that your option will necessarily be treated as an Incentive Stock Option if you continue to provide

services to the Company or an Affiliate as a Consultant or Director after your employment terminates or if you otherwise exercise your option more than three (3) months after the date your employment with the Company or an Affiliate terminates.

9. EXERCISE.

a. You may exercise the vested portion of your option (and the unvested portion of your option if your Grant Notice so permits) during its term by (i) delivering a Notice of Exercise (in a form designated by the Company) or completing such other documents and/or procedures designated by the Company for exercise and (ii) paying the exercise price and any applicable withholding taxes to the Company's Secretary, stock plan administrator, or such other person as the Company may designate, together with such additional documents as the Company may then require.

b. By exercising your option you agree that, as a condition to any exercise of your option, the Company may require you to enter into an arrangement providing for the payment by you to the Company of any tax withholding obligation of the Company arising by reason of (i) the exercise of your option, (ii) the lapse of any substantial risk of forfeiture to which the shares of Common Stock are subject at the time of exercise, or (iii) the disposition of shares of Common Stock acquired upon such exercise.

c. If your option is an Incentive Stock Option, by exercising your option you agree that you will notify the Company in writing within fifteen (15) days after the date of any disposition of any of the shares of the Common Stock issued upon exercise of your option that occurs within two (2) years after the Date of Grant or within one (1) year after such shares of Common Stock are transferred upon exercise of your option.

d. By accepting your option you agree that you will not sell, dispose of, transfer, make any short sale of, grant any option for the purchase of, or enter into any hedging or similar transaction with the same economic effect as a sale, any shares of Common Stock or other securities of the Company held by you, for a period of one hundred eighty (180) days following the effective date of a registration statement of the Company filed under the Securities Act or such longer period as the underwriters or the Company will request to facilitate compliance with FINRA Rule 2241 or NYSE Member Rule 472 or any successor or similar rules or regulation (the "***Lock-Up Period***"); *provided*, *however*, that nothing contained in this section will prevent the exercise of a repurchase option, if any, in favor of the Company during the Lock-Up Period. You further agree to execute and deliver such other agreements as may be reasonably requested by the Company or the underwriters that are consistent with the foregoing or that are necessary to give further effect thereto. In order to enforce the foregoing covenant, the Company may impose stop-transfer instructions with respect to your shares of Common Stock until the end of such period.

You also agree that any transferee of any shares of Common Stock (or other securities) of the Company held by you will be bound by this Section 9(d). The underwriters of the Company's stock are intended third party beneficiaries of this Section 9(d) and will have the right, power and authority to enforce the provisions hereof as though they were a party hereto.

10. TRANSFERABILITY. Except as otherwise provided in this Section 10, your option is not transferable, except by will or by the laws of descent and distribution, and is exercisable during your life only by you.

a. Certain Trusts. Upon receiving written permission from the Board or its duly authorized designee, you may transfer your option to a trust if you are considered to be the sole beneficial owner (determined under Section 671 of the Code and applicable state law) while the option is held in the trust. You and the trustee must enter into transfer and other agreements required by the Company.

b. Domestic Relations Orders. Upon receiving written permission from the Board or its duly authorized designee, and provided that you and the designated transferee enter into transfer and other agreements required by the Company, you may transfer your option pursuant to the terms of a domestic relations order, official marital settlement agreement or other divorce or separation instrument as permitted by Treasury Regulation 1.421-1(b)(2) that contains the information required by the Company to effectuate the transfer. You are encouraged to discuss the proposed terms of any division of this option with the Company prior to finalizing the domestic relations order or marital settlement agreement to help ensure the required information is contained within the domestic relations order or marital settlement agreement. If this option is an Incentive Stock Option, this option may be deemed to be a Nonstatutory Stock Option as a result of such transfer.

c. Beneficiary Designation. Upon receiving written permission from the Board or its duly authorized designee, you may, by delivering written notice to the Company, in a form approved by the Company and any broker designated by the Company to handle option exercises, designate a third party who, on your death, will thereafter be entitled to exercise this option and receive the Common Stock or other consideration resulting from such exercise. In the absence of such a designation, your executor or administrator of your estate will be entitled to exercise this option and receive, on behalf of your estate, the Common Stock or other consideration resulting from such exercise.

11. CHANGE IN CONTROL.

a. If a Change in Control occurs and immediately prior to or within twelve (12) months after, the effective time of such Change in Control your Continuous Service terminates due to an involuntary termination (not including death or Disability) without Cause or due to a voluntary termination with Good Reason, then, as of the date of termination of Continuous Service, the vesting and exercisability of your option will be accelerated in full.

b. "***Good Reason***" means that one or more of the following are undertaken by the Company (or successor to the Company, if applicable) without your express written consent: (i) a material reduction in your annual base salary; *provided*, *however*, that Good Reason will not be deemed to have occurred in the event of a reduction in your annual base salary that is pursuant to a salary reduction program affecting substantially all of the employees of the Company and that does not adversely affect you to a greater extent than other similarly situated employees; (ii) a material reduction in your authority, duties or responsibilities; (iii) any failure by the Company to continue in effect any material benefit plan or program, including incentive plans or plans with respect to the receipt of securities of the Company, in which you were participating immediately prior to the effective date of the Change in Control (hereinafter referred to as "***Benefit Plans***"), or the taking of any action by the Company that would adversely affect your participation in or reduce your benefits under the Benefit Plans or deprive you of any fringe benefit that you enjoyed immediately prior to the effective date of the Change in Control; *provided*, *however*, that Good Reason will not be deemed to have occurred if the Company provides for your participation in benefit plans

and programs that, taken as a whole, are comparable to the Benefit Plans; (iv) a relocation of your principal place of employment with the Company (or

successor to the Company, if applicable) to a place that increases your one-way commute by more than fifty (50) miles as compared to your then-current principal place of employment immediately prior to such relocation, except for required travel by you on the Company's business to an extent substantially consistent with your business travel obligations prior to the effective date of the Change in Control; or (v) a material breach by the Company of any provision of the Plan or the Option Agreement or any other material agreement between you and the Company concerning the terms and conditions of your employment or service with the Company.

c. If any payment or benefit you would receive from the Company or otherwise in connection with a Change in Control or other similar transaction (a "***280G Payment***") would (i) constitute a "parachute payment" within the meaning of Section 280G of the Code, and (ii) but for this sentence, be subject to the excise tax imposed by Section 4999 of the Code (the "***Excise Tax***"), then any such 280G Payment (a "***Payment***") shall be equal to the Reduced Amount. The "***Reduced Amount***" shall be either (x) the largest portion of the Payment that would result in no portion of the Payment (after reduction) being subject to the Excise Tax or (y) the largest portion, up to and including the total, of the Payment, whichever amount (i.e., the amount determined by clause (x) or by clause (y)), after taking into account all applicable federal, state and local employment taxes, income taxes, and the Excise Tax (all computed at the highest applicable marginal rate), results in your receipt, on an after-tax basis, of the greater economic benefit notwithstanding that all or some portion of the Payment may be subject to the Excise Tax. If a reduction in a Payment is required pursuant to the preceding sentence and the Reduced Amount is determined pursuant to clause (x) of the preceding sentence, the reduction shall occur in the manner (the "***Reduction Method***") that results in the greatest economic benefit for you. If more than one method of reduction will result in the same economic benefit, the items so reduced will be reduced pro rata (the "***Pro Rata Reduction Method***").

Notwithstanding the foregoing, if the Reduction Method or the Pro Rata Reduction Method would result in any portion of the Payment being subject to taxes pursuant to Section 409A of the Code that would not otherwise be subject to taxes pursuant to Section 409A of the Code, then the Reduction Method and/or the Pro Rata Reduction Method, as the case may be, shall be modified so as to avoid the imposition of taxes pursuant to Section 409A of the Code as follows: (A) as a first priority, the modification shall preserve to the greatest extent possible, the greatest economic benefit for you as determined on an after-tax basis; (B) as a second priority, Payments that are contingent on future events (e.g., being terminated without cause), shall be reduced (or eliminated) before Payments that are not contingent on future events; and (C) as a third priority, Payments that are "deferred compensation" within the meaning of Section 409A of the Code shall be reduced (or eliminated) before Payments that are not deferred compensation within the meaning of Section 409A of the Code.

Unless you and the Company agree on an alternative accounting firm, the accounting firm engaged by the Company for general tax compliance purposes as of the day prior to the effective date of the change of control transaction triggering the Payment shall perform the foregoing calculations. If the accounting firm so engaged by the Company is serving as accountant or auditor for the individual, entity or group effecting the change of control transaction, the Company shall appoint a nationally recognized accounting firm to make the determinations required hereunder. The Company shall bear all expenses with respect to the determinations by such accounting firm required to be made hereunder. The Company shall use commercially reasonable efforts to cause the accounting firm engaged to make the determinations hereunder to provide its calculations, together with

detailed supporting documentation, to you and the Company within fifteen (15) calendar days after the date on which your right to a 280G

Payment becomes reasonably likely to occur (if requested at that time by you or the Company) or such other time as requested by you or the Company.

If you receive a Payment for which the Reduced Amount was determined pursuant to clause (x) of the first paragraph of this Section 11(b) and the Internal Revenue Service determines thereafter that some portion of the Payment is subject to the Excise Tax, you shall promptly return to the Company a sufficient amount of the Payment (after reduction pursuant to clause (x) of the first paragraph of this Section 11(b) so that no portion of the remaining Payment is subject to the Excise Tax. For the avoidance of doubt, if the Reduced Amount was determined pursuant to clause (y) in the first paragraph of this Section 11(b), you shall have no obligation to return any portion of the Payment pursuant to the preceding sentence.

12. OPTION NOT A SERVICE CONTRACT. Your option is not an employment or service contract, and nothing in your option will be deemed to create in any way whatsoever any obligation on your part to continue in the employ of the Company or an Affiliate, or of the Company or an Affiliate to continue your employment. In addition, nothing in your option will obligate the Company or an Affiliate, their respective stockholders, boards of directors, officers or employees to continue any relationship that you might have as a Director or Consultant for the Company or an Affiliate.

13. WITHHOLDING OBLIGATIONS.

a. At the time you exercise your option, in whole or in part, and at any time thereafter as requested by the Company, you hereby authorize withholding from payroll and any other amounts payable to you, and otherwise agree to make adequate provision for (including by means of a "same day sale" pursuant to a program developed under Regulation T as promulgated by the Federal Reserve Board to the extent permitted by the Company), any sumsrequired to satisfy the federal, state, local and foreign tax withholding obligations of the Company or an Affiliate, if any, which arise in connection with the exercise of your option.

b. If this option is a Nonstatutory Stock Option, then upon your request and subject to approval by the Company, and compliance with any applicable legal conditions or restrictions, the Company may withhold from fully vested shares of Common Stock otherwise issuable to you upon the exercise of your option a number of whole shares of Common Stock having a Fair Market Value, determined by the Company as of the date of exercise, not in excess of the maximum amount of tax required to be withheld by law (or such other amount as may be permitted while still avoiding classification of your option as a liability for financial accounting purposes). If the date of determination of any tax withholding obligation is deferred to a date later than the date of exercise of your option, share withholding pursuant to the preceding sentence shall not be permitted unless you make a proper and timely election under Section 83(b) of the Code, covering the aggregate number of shares of Common Stock acquired upon such exercise with respect to which such determination is otherwise deferred, to accelerate the determination of such tax withholding obligation to the date of exercise of your option. Notwithstanding the filing of such election, shares of Common Stock shall be withheld solely from fully vested shares of Common Stock determined as of the date of exercise of your option that are otherwise issuable to you upon such exercise. Any adverse consequences to you arising in connection with such share withholding procedure shall be your sole responsibility.

c. You may not exercise your option unless the tax withholding obligations of the Company and/or any Affiliate are satisfied. Accordingly, you may not be able to exercise your option when desired even though your option is vested, and the Company will have no obligation to issue a certificate for such shares of Common Stock or release such shares of Common Stock from any escrow provided for herein, if applicable, unless such obligations are satisfied.

14. TAX CONSEQUENCES. You hereby agree that the Company does not have a duty to design or administer the Plan or its other compensation programs in a manner that minimizes your tax liabilities. You will not make any claim against the Company, or any of its Officers, Directors, Employees or Affiliates related to tax liabilities arising from your option or your other compensation. In particular, you acknowledge that this option is exempt from Section 409A of the Code only if the exercise price per share specified in the Grant Notice is at least equal to the "fair market value" per share of the Common Stock on the Date of Grant and there is no other impermissible deferral of compensation associated with the option.

15. NOTICES. Any notices provided for in your option or the Plan will be given in writing (including electronically) and will be deemed effectively given upon receipt or, in the case of notices delivered by mail by the Company to you, five (5) days after deposit in the United States mail, postage prepaid, addressed to you at the last address you provided to the Company. The Company may, in its sole discretion, decide to deliver any documents related to participation in the Plan and this option by electronic means or to request your consent to participate in the Plan by electronic means. By accepting this option, you consent to receive such documents by electronic delivery and to participate in the Plan through an on-line or electronic system established and maintained by the Company or another third party designated by the Company.

16. GOVERNING PLAN DOCUMENT. Your option is subject to all the provisions of the Plan, the provisions of which are hereby made a part of your option, and is further subject to all interpretations, amendments, rules and regulations, which may from time to time be promulgated and adopted pursuant to the Plan. If there is any conflict between the provisions of your option and those of the Plan, the provisions of the Plan will control. In addition, your option (and any compensation paid or shares issued under your option) is subject to recoupment in accordance with The Dodd-Frank Wall Street Reform and Consumer Protection Act and any implementing regulations thereunder, any compensation recovery policy otherwise required by applicable law and any recoupment or clawback policy adopted by the Company (whether or not required by applicable law).

17. OTHER DOCUMENTS. You hereby acknowledge receipt of and the right to receive a document providing the information required by Rule 428(b)(1) promulgated under the Securities Act, which includes the Plan prospectus. In addition, you acknowledge receipt of the Company's policy permitting certain individuals to sell shares only during certain "window" periods and the Company's insider trading policy, in effect from time to time.

18. EFFECT ON OTHER EMPLOYEE BENEFIT PLANS. The value of this option will not be included as compensation, earnings, salaries, or other similar terms used when calculating your benefits under any employee benefit plan sponsored by the Company or any Affiliate, except as such plan otherwise expressly provides. The Company expressly reserves its rights to amend, modify, or terminate any of the Company's or any Affiliate's employee benefit plans.

19. VOTING RIGHTS. You will not have voting or any other rights as a stockholder of the Company with respect to the shares to be issued pursuant to this option until such shares are issued to you. Upon such issuance, you will obtain full

voting and other rights as a stockholder of the Company. Nothing contained in this option, and no action taken pursuant to its provisions, will create or be construed to create a trust of any kind or a fiduciary relationship between you and the Company or any other person.

20. SEVERABILITY. If all or any part of this Option Agreement or the Plan is declared by any court or governmental authority to be unlawful or invalid, such unlawfulness or invalidity will not invalidate any portion of this Option Agreement or the Plan not declared to be unlawful or invalid. Any Section of this Option Agreement (or part of such a Section) so declared to be unlawful or invalid shall, if possible, be construed in a manner which will give effect to the terms of such Section or part of a Section to the fullest extent possible while remaining lawful and valid.

21. MISCELLANEOUS.

a. The rights and obligations of the Company under your option will be transferable to any one or more persons or entities, and all covenants and agreements hereunder will inure to the benefit of, and be enforceable by the Company's successors and assigns.

b. You agree upon request to execute any further documents or instruments necessary or desirable in the sole determination of the Company to carry out the purposes or intent of your option.

c. You acknowledge and agree that you have reviewed your option in its entirety, have had an opportunity to obtain the advice of counsel prior to executing and accepting your option, and fully understand all provisions of your option.

d. This Option Agreement will be subject to all applicable laws, rules, and regulations, and to such approvals by any governmental agencies or national securities exchanges as may be required.

e. All obligations of the Company under the Plan and this Option Agreement will be binding on any successor to the Company, whether the existence of such successor is the result of a direct or indirect purchase, merger, consolidation, or otherwise, of all or substantially all of the business and/or assets of the Company.

* * *

This Option Agreement will be deemed to be signed by you upon the signing by you of the Stock Option Grant Notice to which it is attached.

ATTACHMENT II

2019 EQUITY INCENTIVE PLAN

ATTACHMENT III

NOTICE OF EXERCISE

Bellicum Pharmaceuticals, Inc.

Life Sciences Plaza

2130 West Holcombe Boulevard, Suite 850

Houston, Texas 77030 Date of Exercise: _____

This constitutes notice to Bellicum Pharmaceuticals, Inc. (the "***Company***") under my stock option that I elect to purchase the below number of shares of Common Stock of the Company (the "***Shares***") for the price set forth below.

Type of option (check one):	Incentive o	Nonstatutory o
Stock option dated:	_____	_____
Number of Shares as to which option is exercised:	_____	_____
Certificates to be issued in name of:	_____	_____
Total exercise price:	$_____	$_____
Cash payment delivered herewith:	$_____	$_____
[Value of _____ Shares delivered herewith:	$_____	$_____]
[Value of _____ Shares pursuant to net exercise[2]:	$_____	$_____]
[Regulation T Program (cashless exercise[3]):	$_____	$_____]

[1] Shares must meet the public trading requirements set forth in the option. Shares must be valued in accordance with the terms of the option being exercised, and must be owned free and clear of any liens, claims, encumbrances or security interests. Certificates must be endorsed or accompanied by an executed assignment separate from certificate.

[2] The option must be a Nonstatutory Stock Option, and Bellicum Pharmaceuticals, Inc. must have established net exercise procedures at the time of exercise, in order to utilize this payment method.

[3] Shares must meet the public trading requirements set forth in the option.

DOUBLE TRIGGER FORM

By this exercise, I agree (i) to provide such additional documents as you may require pursuant to the terms of the Bellicum Pharmaceuticals, Inc. 2019 Equity Incentive Plan, (ii) to provide for the payment by me to you (in the manner designated by you) of your withholding obligation, if any, relating to the exercise of this option, and (iii) if this exercise relates to an incentive stock option, to notify you in writing within fifteen (15) days after the date of any disposition of any of the Shares issued upon exercise of this option that occurs within two (2) years after the date of grant of this option or within one (1) year after such Shares are issued upon exercise of this option.

Very truly yours,

_____

BELLICUM PHARMACEUTICALS, INC.
RESTRICTED STOCK UNIT GRANT NOTICE
(2019 EQUITY INCENTIVE PLAN)

Bellicum Pharmaceuticals, Inc. (the "***Company***"), pursuant to Section 6(b) of the Company's 2019 Equity Incentive Plan (the "***Plan***"), hereby awards to Participant a Restricted Stock Unit Award for the number of shares of the Company's Common Stock ("***Restricted Stock Units***") set forth below (the "***Award***"). The Award is subject to all of the terms and conditions as set forth in this notice of grant (this "***Restricted Stock Unit Grant Notice***") and in the Plan and the Restricted Stock Unit Award Agreement (the "***Award Agreement***"), both of which are attached hereto and incorporated herein in their entirety. Capitalized terms not otherwise defined herein shall have the meanings set forth in the Plan or the Award Agreement. In the event of any conflict between the terms in the Award and the Plan, the terms of the Plan shall control.

Participant: _____
Date of Grant: _____
Grant Number: _____
Vesting Commencement Date: _____
Number of Restricted Stock Units: _____

Vesting Schedule: [25% of the Restricted Stock Units will vest on the one year anniversary of the earlier of the (i) Date of Grant and (ii) Vesting Commencement Date and 25% of the Restricted Stock Units will vest on each of the two, three and four year anniversaries of the Vesting Commencement Date, subject to the Participant's Continuous Service through each such vesting date]

Issuance Schedule: Subject to any Capitalization Adjustment, one share of Common Stock (or its cash equivalent, at the discretion of the Company) will be issued for each Restricted Stock Unit that vests at the time set forth in Section 6 of the Award Agreement.

Additional Terms/Acknowledgements: Participant acknowledges receipt of, and understands and agrees to, this Restricted Stock Unit Grant Notice, the Award Agreement and the Plan. Participant further acknowledges that as of the Date of Grant, this Restricted Stock Unit Grant Notice, the Award Agreement and the Plan set forth the entire understanding between Participant and the Company regarding the acquisition of the Common Stock pursuant to the Award specified above and supersede all prior oral and written agreements on the terms of this Award with the exception, if applicable, of (i) the written employment agreement, offer letter or other written agreement entered into between the Company and Participant specifying the terms that should govern this specific Award, (ii) restricted stock unit awards or options previously granted and delivered to Participant, and (iii) any compensation recovery policy that is adopted by the Company or is otherwise required by applicable law.

By accepting this Award, Participant acknowledges having received and read the Restricted Stock Unit Grant Notice, the Award Agreement and the Plan and agrees to all of the terms and conditions set forth in these documents. Participant consents to receive

Plan documents by electronic delivery and to participate in the Plan through an on-line or electronic system established and maintained by the Company or another third party designated by the Company.

PARTICIPANT

BELLICUM PHARMACEUTICALS, INC.
By:_____
Signature
Title:_____
Date:_____

_____
Signature

Date:_____

ATTACHMENTS: Award Agreement and 2019 Equity Incentive Plan

BELLICUM PHARMACEUTICALS, INC.
2019 EQUITY INCENTIVE PLAN
RESTRICTED STOCK UNIT AWARD AGREEMENT

Pursuant to the Restricted Stock Unit Grant Notice (the "***Grant Notice***") and this Restricted Stock Unit Award Agreement (the "***Agreement***"), Bellicum Pharmaceuticals, Inc. (the "***Company***") has awarded you ("***Participant***") a Restricted Stock Unit Award (the "***Award***") pursuant to Section 6(b) of the Company's 2019 Equity Incentive Plan (the "***Plan***") for the number of Restricted Stock Units/shares indicated in the Grant Notice. Capitalized terms not explicitly defined in this Agreement or the Grant Notice shall have the same meanings given to them in the Plan. The terms of your Award, in addition to those set forth in the Grant Notice, are as follows.

1. GRANT OF THE AWARD. This Award represents the right to be issued on a future date one (1) share of Common Stock for each Restricted Stock Unit that vests on the applicable vesting date(s) (subject to any adjustment under Section 3 below) as indicated in the Grant Notice. As of the Date of Grant, the Company will credit to a bookkeeping account maintained by the Company for your benefit (the "***Account***") the number of Restricted Stock Units/shares of Common Stock subject to the Award. Notwithstanding the foregoing, the Company reserves the right to issue you the cash equivalent of Common Stock, in part or in full satisfaction of the delivery of Common Stock in connection with the vesting of the Restricted Stock Units, and, to the extent applicable, references in this Agreement and the Grant Notice to Common Stock issuable in connection with your Restricted Stock Units will include the potential issuance of its cash equivalent pursuant to such right. This Award was granted in consideration of your services to the Company.

2. VESTING. Subject to the limitations contained herein, your Award will vest, if at all, in accordance with the vesting schedule provided in the Grant Notice, provided that vesting will cease upon the termination of your Continuous Service. Upon such termination of your Continuous Service, the Restricted Stock Units/shares of Common Stock credited to the Account that were not vested on the date of such termination will be forfeited at no cost to the Company and you will have no further right, title or interest in or to such underlying shares of Common Stock.

3. NUMBER OF SHARES. The number of Restricted Stock Units/shares subject to your Award may be adjusted from time to time for Capitalization Adjustments, as provided in the Plan. Any additional Restricted Stock Units, shares, cash or other property that becomes subject to the Award pursuant to this Section 3, if any, shall be subject, in a manner determined by the Board, to the same forfeiture restrictions, restrictions on transferability, and time and manner of delivery as applicable to the other Restricted Stock Units and shares covered by your Award. Notwithstanding the provisions of this Section 3, no fractional shares or rights for fractional shares of Common Stock shall be created pursuant to this Section 3. Any fraction of a share will be rounded down to the nearest whole share.

4. SECURITIES LAW COMPLIANCE. You may not be issued any Common Stock under your Award unless the shares of Common Stock underlying the Restricted Stock Units are either (i) then registered under the Securities Act, or (ii) the Company has determined that such issuance would be exempt from the registration requirements of the Securities Act. Your Award must also comply with other applicable laws and regulations governing the Award, and you shall not receive such

Common Stock if the Company determines that such receipt would not be in material compliance with such laws and regulations.

5. TRANSFER RESTRICTIONS. Prior to the time that shares of Common Stock have been delivered to you, you may not transfer, pledge, sell or otherwise dispose of this Award or the shares issuable in respect of your Award, except as expressly provided in this Section 5. For example, you may not use shares that may be issued in respect of your Restricted Stock Units as security for a loan. The restrictions on transfer set forth herein will lapse upon delivery to you of shares in respect of your vested Restricted Stock Units.

a. Death. Your Award is transferable by will and by the laws of descent and distribution. At your death, vesting of your Award will cease and your executor or administrator of your estate shall be entitled to receive, on behalf of your estate, any Common Stock or other consideration that vested but was not issued before your death.

b. Domestic Relations Orders. Upon receiving written permission from the Board or its duly authorized designee, and provided that you and the designated transferee enter into transfer and other agreements required by the Company, you may transfer your right to receive the distribution of Common Stock or other consideration hereunder, pursuant to a domestic relations order, marital settlement agreement or other divorce or separation instrument as permitted by applicable law that contains the information required by the Company to effectuate the transfer. You are encouraged to discuss the proposed terms of any division of this Award with the Company General Counsel prior to finalizing the domestic relations order or marital settlement agreement to verify that you may make such transfer, and if so, to help ensure the required information is contained within the domestic relations order or marital settlement agreement.

6. DATE OF ISSUANCE.

a. The issuance of shares in respect of the Restricted Stock Units is intended to comply with Treasury Regulations Section 1.409A-1(b)(4) and will be construed and administered in such a manner.

Subject to the satisfaction of the Withholding Taxes set forth in Section 11 of this Agreement, in the event one or more Restricted Stock Units vests, the Company shall issue to you one (1) share of Common Stock for each Restricted Stock Unit that vests on the applicable vesting date(s) (subject to any adjustment under Section 3 above). Each issuance date determined by this paragraph is referred to as an "***Original Issuance Date***".

b. If the Original Issuance Date falls on a date that is not a business day, delivery shall instead occur on the next following business day. In addition, if:

1) the Original Issuance Date does not occur (1) during an "open window period" applicable to you, as determined by the Company in accordance with the Company's then-effective policy on trading in Company securities, or (2) on a date when you are otherwise permitted to sell shares of Common Stock on an established stock exchange or stock market (including but not limited to under a previously established written trading plan that meets the requirements of Rule 10b5-1 under the Exchange Act and was entered into in compliance with the Company's policies (a "***10b5-1 Plan***")), *and*

2) either (1) Withholding Taxes do not apply, or (2) the Company decides, prior to the Original Issuance Date, (A) not to satisfy the Withholding Taxes by withholding shares of Common Stock from the shares otherwise due,

on the Original Issuance Date, to you under this Award, and (B) not to permit you to then effect a sale on the market under a 10b5-1 Plan and (C) not to permit you to pay your Withholding Taxes in cash,

then the shares that would otherwise be issued to you on the Original Issuance Date will not be delivered on such Original Issuance Date and will instead be delivered on the first business day when you are not prohibited from selling shares of the Company's Common Stock in the open public market, but in no event later than December 31 of the calendar year in which the Original Issuance Date occurs (that is, the last day of your taxable year in which the Original Issuance Date occurs), or, if and only if permitted in a manner that complies with Treasury Regulations Section 1.409A-1(b)(4), no later than the date that is the 15th day of the third calendar month of the applicable year following the year in which the shares of Common Stock under this Award are no longer subject to a "substantial risk of forfeiture" within the meaning of Treasury Regulations Section 1.409A-1(d).

c. The form of delivery (*e.g.*, a stock certificate or electronic entry evidencing such shares) shall be determined by the Company.

7. DIVIDENDS. You shall receive no benefit or adjustment to your Award with respect to any cash dividend, stock dividend or other distribution except as provided in the Plan with respect to a Capitalization Adjustment.

8. RESTRICTIVE LEGENDS. The shares of Common Stock issued under your Award shall be endorsed with appropriate legends as determined by the Company.

9. EXECUTION OF DOCUMENTS. You hereby acknowledge and agree that the manner selected by the Company by which you indicate your consent to your Grant Notice is also deemed to be your execution of your Grant Notice and of this Agreement. You further agree that such manner of indicating consent may be relied upon as your signature for establishing your execution of any documents to be executed in the future in connection with your Award.

10. AWARD NOT A SERVICE CONTRACT.

a. Nothing in this Agreement (including, but not limited to, the vesting of your Award or the issuance of the shares in respect of your Award), the Plan or any covenant of good faith and fair dealing that may be found implicit in this Agreement or the Plan shall: (i) confer upon you any right to continue in the employ or service of, or affiliation with, the Company or an Affiliate; (ii) constitute any promise or commitment by the Company or an Affiliate regarding the fact or nature of future positions, future work assignments, future compensation or any other term or condition of employment or affiliation; (iii) confer any right or benefit under this Agreement or the Plan unless such right or benefit has specifically accrued under the terms of this Agreement or Plan; or (iv) deprive the Company of the right to terminate you at will and without regard to any future vesting opportunity that you may have.

b. By accepting this Award, you acknowledge and agree that the right to continue vesting in the Award pursuant to the vesting schedule provided in the Grant Notice may not be earned unless (in addition to any other conditions described in the Grant Notice and this Agreement) you continue as an employee, director or consultant at the will of the Company and affiliate, as applicable (not through the act of being hired, being granted this Award or any other award or

benefit) and that the Company has the right to reorganize, sell, spin-out or otherwise restructure one or more of its businesses or Affiliates at any

time or from time to time, as it deems appropriate (a "***reorganization***"). You acknowledge and agree that such a reorganization could result in the termination of your Continuous Service, or the termination of Affiliate status of your employer and the loss of benefits available to you under this Agreement, including but not limited to, the termination of the right to continue vesting in the Award. You further acknowledge and agree that this Agreement, the Plan, the transactions contemplated hereunder and the vesting schedule set forth herein or any covenant of good faith and fair dealing that may be found implicit in any of them do not constitute an express or implied promise of continued engagement as an employee or consultant for the term of this Agreement, for any period, or at all, and shall not interfere in any way with the Company's right to terminate your Continuous Service at any time, with or without your cause or notice, or to conduct a reorganization.

11. WITHHOLDING TAXES.

a. On each vesting date, and on or before the time you receive a distribution of the shares of Common Stock in respect of your Restricted Stock Units, and at any other time as reasonably requested by the Company in accordance with applicable tax laws, you hereby authorize any required withholding from the Common Stock issuable to you and/or otherwise agree to make adequate provision, including in cash, for any sums required to satisfy the federal, state, local and foreign tax withholding obligations of the Company or any Affiliate that arise in connection with your Award (the "***Withholding Taxes***"). Additionally, the Company or any Affiliate may, in its sole discretion, satisfy all or any portion of the Withholding Taxes obligation relating to your Award by any of the following means or by a combination of such means (and by accepting this Award you hereby authorize any of the following methods of satisfying the Withholding Taxes): (i) withholding from any compensation otherwise payable to you by the Company or an Affiliate; (ii) causing you to tender a cash payment; (iii) permitting or requiring you to enter into a "same day sale" commitment, if applicable, with a broker-dealer that is a member of the Financial Industry Regulatory Authority (a "***FINRA Dealer***") whereby you irrevocably elect to sell a portion of the shares to be delivered in connection with your Restricted Stock Units to satisfy the Withholding Taxes and whereby the FINRA Dealer irrevocably commits to forward the proceeds necessary to satisfy the Withholding Taxes directly to the Company and/or its Affiliates; or (iv) withholding shares of Common Stock from the shares of Common Stock issued or otherwise issuable to you in connection with the Award with a Fair Market Value (measured as of the date shares of Common Stock are issued pursuant to Section 6) not in excess of the maximum amount of tax that may be required to be withheld by law (or such other amount as may be permitted while sill avoiding classification of the Award as a liability for financial accounting purposes); and *provided*, further, that to the extent necessary to qualify for an exemption from application of Section 16(b) of the Exchange Act, if applicable, such share withholding procedure will be subject to the express prior approval of the Board or the Company's Compensation Committee.

b. Unless the Withholding Taxes are satisfied, the Company shall have no obligation to deliver to you any Common Stock or any other consideration pursuant to this Award.

c. In the event the Withholding Taxes arise prior to the delivery to you of Common Stock or it is determined after the delivery of Common Stock to you that the amount of the Withholding Taxes was greater than the amount withheld by the Company, you agree to indemnify and hold the Company harmless from any failure by the Company to withhold the proper amount.

12. TAX CONSEQUENCES. The Company has no duty or obligation to minimize the tax consequences to you of this Award and shall not be liable to you for any adverse tax consequences to you arising in connection with this Award. You are hereby advised to consult with your own personal tax, financial and/or legal advisors regarding the tax consequences of this Award and by signing the Grant Notice, you have agreed that you have done so or knowingly and voluntarily declined to do so. You understand that you (and not the Company) shall be responsible for your own tax liability that may arise as a result of this investment or the transactions contemplated by this Agreement.

13. LOCK-UP PERIOD. By accepting your Award, you agree that you will not sell, dispose of, transfer, make any short sale of, grant any option for the purchase of, or enter into any hedging or similar transaction with the same economic effect as a sale, any Common Shares or other securities of the Company held by you, for a period of one hundred eighty (180) days following the effective date of a registration statement of the Company filed under the Securities Act or such longer period as the underwriters or the Company will request to facilitate compliance with FINRA Rule 2241, NYSE Member Rule 472 or any successor or similar rules or regulation (the "***Lock-Up Period***"); *provided*, *however*, that nothing contained in this section will prevent the exercise of a repurchase option, if any, in favor of the Company during the Lock-Up Period. You further agree to execute and deliver such other agreements as may be reasonably requested by the Company or the underwriters that are consistent with the foregoing or that are necessary to give further effect thereto. In order to enforce the foregoing covenant, the Company may impose stop-transfer instructions with respect to your Common Shares until the end of such period. You also agree that any transferee of any Common Shares (or other securities) of the Company held by you will be bound by this Section 13. The underwriters of the Company's shares are intended third party beneficiaries of this Section 13 and will have the right, power and authority to enforce the provisions hereof as though they were a party hereto.

14. UNSECURED OBLIGATION. Your Award is unfunded, and as a holder of a vested Award, you shall be considered an unsecured creditor of the Company with respect to the Company's obligation, if any, to issue shares or other property pursuant to this Agreement. You shall not have voting or any other rights as a stockholder of the Company with respect to the shares to be issued pursuant to this Agreement until such shares are issued to you pursuant to Section 6 of this Agreement. Upon such issuance, you will obtain full voting and other rights as a stockholder of the Company. Nothing contained in this Agreement, and no action taken pursuant to its provisions, shall create or be construed to create a trust of any kind or a fiduciary relationship between you and the Company or any other person.

15. NOTICES. Any notice or request required or permitted hereunder shall be given in writing (including electronically) and will be deemed effectively given upon receipt or, in the case of notices delivered by mail by the Company to you, five (5) days after deposit in the United States mail, postage prepaid, addressed to you at the last address you provided to the Company. The Company may, in its sole discretion, decide to deliver any documents related to participation in the Plan and this Award by electronic means or to request your consent to participate in the Plan by electronic means. By accepting this Award, you consent to receive such documents by electronic delivery and to participate in the Plan through an on-line or electronic system established and maintained by the Company or another third party designated by the Company.

16. HEADINGS. The headings of the Sections in this Agreement are inserted for convenience only and shall not be deemed to constitute a part of this Agreement or to affect the meaning of this Agreement.

17. MISCELLANEOUS.

a. The rights and obligations of the Company under your Award shall be transferable by the Company to any one or more persons or entities, and all covenants and agreements hereunder shall inure to the benefit of, and be enforceable by, the Company's successors and assigns.

b. You agree upon request to execute any further documents or instruments necessary or desirable in the sole determination of the Company to carry out the purposes or intent of your Award.

c. You acknowledge and agree that you have reviewed your Award in its entirety, have had an opportunity to obtain the advice of counsel prior to executing and accepting your Award and fully understand all provisions of your Award.

d. This Agreement shall be subject to all applicable laws, rules, and regulations, and to such approvals by any governmental agencies or national securities exchanges as may be required.

e. All obligations of the Company under the Plan and this Agreement shall be binding on any successor to the Company, whether the existence of such successor is the result of a direct or indirect purchase, merger, consolidation, or otherwise, of all or substantially all of the business and/or assets of the Company.

18. GOVERNING PLAN DOCUMENT. Your Award is subject to all the provisions of the Plan, the provisions of which are hereby made a part of your Award, and is further subject to all interpretations, amendments, rules and regulations which may from time to time be promulgated and adopted pursuant to the Plan. Your Award (and any compensation paid or shares issued under your Award) is subject to recoupment in accordance with The Dodd-Frank Wall Street Reform and Consumer Protection Act and any implementing regulations thereunder, any compensation recovery policy otherwise required by applicable law and any recoupment or clawback policy adopted by the Company (whether or not required by applicable law). No recovery of compensation under such a clawback policy will be an event giving rise to a right to voluntarily terminate employment upon a resignation for "good reason," or for a "constructive termination" or any similar term under any plan of or agreement with the Company.

19. EFFECT ON OTHER EMPLOYEE BENEFIT PLANS. The value of the Award subject to this Agreement shall not be included as compensation, earnings, salaries, or other similar terms used when calculating benefits under any employee benefit plan (other than the Plan) sponsored by the Company or any Affiliate except as such plan otherwise expressly provides. The Company expressly reserves its rights to amend, modify, or terminate any or all of the employee benefit plans of the Company or any Affiliate.

20. SEVERABILITY. If all or any part of this Agreement or the Plan is declared by any court or governmental authority to be unlawful or invalid, such unlawfulness or invalidity shall not invalidate any portion of this Agreement or the Plan not declared to be unlawful or invalid. Any Section of this Agreement (or part of such a Section) so declared to be unlawful or invalid shall, if possible, be construed in a manner which will give effect to the terms of such Section or part of a Section to the fullest extent possible while remaining lawful and valid.

21. OTHER DOCUMENTS. You hereby acknowledge receipt or the right to receive a document providing the information required by Rule 428(b)(1) promulgated under the Securities Act. In addition, you acknowledge receipt of the Company's policy permitting certain individuals to sell shares only during certain "window" periods and the Company's insider trading policy, in effect from time to time.

22. AMENDMENT. This Agreement may not be modified, amended or terminated except by an instrument in writing, signed by you and by a duly authorized representative of the Company. Notwithstanding the foregoing, this Agreement may be amended solely by the Board by a writing which specifically states that it is amending this Agreement, so long as a copy of such amendment is delivered to you, and provided that, except as otherwise expressly provided in the Plan, no such amendment materially adversely affecting your rights hereunder may be made without your written consent. Without limiting the foregoing, the Board reserves the right to change, by written notice to you, the provisions of this Agreement in any way it may deem necessary or advisable to carry out the purpose of the Award as a result of any change in applicable laws or regulations or any future law, regulation, ruling, or judicial decision, provided that any such change shall be applicable only to rights relating to that portion of the Award which is then subject to restrictions as provided herein.

23. SECTION 409A OF THE CODE. This Award is intended to be exempt from the application of Section 409A of the Code, including but not limited to by reason of complying with the "short-term deferral" rule set forth in Treasury Regulation Section 1.409A-1(b)(4) and any ambiguities herein shall be interpreted accordingly. Notwithstanding the foregoing, if it is determined that the Award fails to satisfy the requirements of the short-term deferral rule and is otherwise not exempt from, and determined to be deferred compensation subject to Section 409A of the Code, this Award shall comply with Section 409A to the extent necessary to avoid adverse personal tax consequences and any ambiguities herein shall be interpreted accordingly. If it is determined that the Award is deferred compensation subject to Section 409A and you are a "Specified Employee" (within the meaning set forth in Section 409A(a)(2)(B)(i) of the Code) as of the date of your "Separation from Service" (within the meaning of Treasury Regulation Section 1.409A-1(h) and without regard to any alternative definition thereunder), then the issuance of any shares that would otherwise be made upon the date of your Separation from Service or within the first six (6) months thereafter will not be made on the originally scheduled date(s) and will instead be issued in a lump sum on the date that is six (6) months and one day after the date of the Separation from Service, with the balance of the shares issued thereafter in accordance with the original vesting and issuance schedule set forth above, but if and only if such delay in the issuance of the shares is necessary to avoid the imposition of adverse taxation on you in respect of the shares under Section 409A of the Code. Each installment of shares that vests is intended to constitute a "separate payment" for purposes of Treasury Regulation Section 1.409A-2(b)(2).

* * * * *

This Restricted Stock Unit Award Agreement shall be deemed to be signed by the Company and the Participant upon the signing by the Participant of the Restricted Stock Unit Grant Notice to which it is attached.

ATTACHMENT

2019 EQUITY INCENTIVE PLAN

Exhibit 21.1

Subsidiaries of Bellicum Pharmaceuticals, Inc.
as of December 31, 2020

Bellicum Pharma Limited, a private limited company organized under the laws of the United Kingdom

Bellicum Pharma GmbH, a private limited liability company organized under the laws of Germany

Exhibit 23.1

Consent of Independent Registered Public Accounting Firm

We consent to the incorporation by reference in the following Registration Statements:

(1) Registration Statements (Form S-3 Nos. 333-219020, 333-226652, and 333-232771) of Bellicum Pharmaceuticals, Inc., and

(2) Registration Statements (Form S-8 Nos. 333-201036, 333-216656, 333-218772, 333-220170, 333-223636, 333-225554, 333-231272, 333-232304, 333-232774, 333-236149, and 333-241675) pertaining to the 2006 Stock Option Plan, 2011 Stock Option Plan, 2014 Equity Incentive Plan, as amended, 2014 Employee Stock Purchase Plan, Bellicum Pharmaceuticals, Inc. 2019 Equity Incentive Plan, and 2019 Equity Incentive Plan of Bellicum Pharmaceuticals, Inc.

of our report dated March 30, 2021, with respect to the consolidated financial statements of Bellicum Pharmaceuticals, Inc. included in this Annual Report (Form 10-K) of Bellicum Pharmaceuticals, Inc. for the year ended December 31, 2020.

/s/ Ernst & Young LLP

Houston, Texas
March 30, 2021

Exhibit 31

CERTIFICATION OF PRINCIPAL EXECUTIVE OFFICER AND PRINCIPAL FINANCIAL OFFICER
PURSUANT TO RULE 13a-14(a) AND 15d-14(a) OF THE SECURITIES EXCHANGE ACT, AS ADOPTED PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Richard A. Fair, certify that:

1. I have reviewed this Annual Report on Form 10-K of Bellicum Pharmaceuticals, 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. I am responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

a. Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

b. Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

c. Evaluated the effectiveness of the registrant’s disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

d. Disclosed in this report any change in the registrant’s internal control over financial reporting that occurred during the registrant’s most recent fiscal quarter (the registrant’s fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant’s internal control over financial reporting; and

5. 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 30, 2021

/s/Richard A. Fair
Richard A. Fair
President and Chief Executive Officer
(Principal Executive Officer and Principal Financial Officer)

Exhibit 32

CERTIFICATION PURSUANT TO 18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

I, Richard A. Fair, principal executive officer and principal officer of Bellicum Pharmaceuticals, Inc. (the "Registrant"), do hereby certify in accordance with 18 U.S.C. 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that, based upon my knowledge:

(1) this Annual Report on Form 10-K for the fiscal year ended December 31, 2020 of the Registrant, to which this certification is attached as an exhibit (the "Report"), fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934 (15 U.S.C. 78m(a)); and

(2) the information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Registrant.

Date: March 30, 2021

/s/ Richard A. Fair
Richard A. Fair
President and Chief Executive Officer

This certification accompanies the Form 10-K to which it relates, is not deemed filed with the Securities and Exchange Commission and is not to be incorporated by reference into any filing of the Company under the Securities Act of 1933, as amended, or the Securities Exchange Act of 1934, as amended (whether made before or after the date of the Form 10-K), irrespective of any general incorporation language contained in such filing.