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, 2018

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 001-37345

ADURO BIOTECH, INC.

(Exact name of Registrant as specified in its Charter)

Delaware	**94-3348934**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification No.)**

740 Heinz Avenue
Berkeley, California 94710
(Address of principal executive offices including zip code)

Registrant's telephone number, including area code: (510) 848-4400

Securities registered pursuant to Section 12(b) of the Act: Common Stock, Par Value $0.0001 Per Share; Common stock traded on the Nasdaq Stock Market

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

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

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

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

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

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§229.405) is not contained herein, and will not be contained, to the best of Registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. ☒

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

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

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

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

The aggregate market value of the Registrant's common stock held by non-affiliates as of June 30, 2018, based on the closing price of the shares of common stock on the Nasdaq Stock Market for such date, was $447,489,686.

The number of shares of Registrant's Common Stock outstanding as of February 22, 2019 was 79,709,275.

Portions of the Registrant's Definitive Proxy Statement relating to the Annual Meeting of Shareholders, which will be filed with the Securities and Exchange Commission within 120 days after the end of the Registrant's fiscal year ended December 31, 2018, are incorporated by reference into Part III of this Report.

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SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

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

- the potential of our technologies and our ability to execute on our corporate strategy;
- our ability to fund our working capital needs into 2022;
- our ability to develop and commercialize our product candidates;
- our ability to use and expand our technologies to build a pipeline of product candidates;
- our ability to obtain and maintain regulatory approval of our product candidates;
- the strength and breadth of our patent portfolio;
- the potential for receipt of additional milestone payments;
- our ability to obtain and adequately protect intellectual property rights for our product candidates;
- our continued reliance of third parties for manufacturing our product candidates, conducting our clinical trials and certain research activities;
- our ability to in-license, acquire or invest in complementary businesses, technologies, products or assets to further expand or complement our portfolio of product candidates;
- expected timing of our clinical trials; and
- the timing and availability of results of our clinical trials and those of our collaborators.

These statements are only current predictions and are subject to known and unknown risks, uncertainties and other factors that may cause our or our industry's actual results, levels of activity, performance or achievements to be materially different from those anticipated by the forward-looking statements. We discuss many of these risks in greater detail under the heading "Risk Factors" and elsewhere in this Annual Report on Form 10-K. You should not rely upon forward-looking statements as predictions of future events. New risk factors and uncertainties may emerge from time to time, and it is not possible for management to predict all risks and uncertainties.

Although we believe that the expectations reflected in the forward-looking statements are reasonable, we cannot guarantee future results, levels of activity, performance or achievements. Except as required by law, after the date of this report, we are under no duty to update or revise any of the forward-looking statements, whether as a result of new information, future events or otherwise.

We obtained industry, market and competitive position data in this report from our own internal estimates and research as well as from industry and general publications and research surveys and studies conducted by third parties. These data involve a number of assumptions and limitations, and you are cautioned not to give undue weight to such information or estimates.

PART I

Item 1. Business.

Overview

References herein to "we," "us," "Company" and "Aduro" refer to Aduro Biotech, Inc. and its consolidated subsidiaries unless the context specifically states otherwise.

We are an immunotherapy company focused on the discovery, development and commercialization of therapies that are designed to harness the body's natural immune system for the treatment of patients with challenging diseases. Our primary technologies related to the Stimulator of Interferon Genes (STING) and A Proliferation Inducing Ligand (APRIL) pathways have led to what we believe is a strong pipeline of clinical candidates that are being investigated in cancer, autoimmune and inflammatory diseases. Our product candidates are designed to stimulate and/or regulate innate and adaptive immune responses, particularly in combination with other novel immunotherapies. We are collaborating with a number of leading global pharmaceutical companies to help expand and drive our product pipeline. Our strategy is to rapidly advance best-in-class therapies from our STING and APRIL technologies through clinical development and regulatory approval.

Our STING pathway activator technology is designed to activate the intracellular STING receptor, which may result in a potent tumor-specific immune response. We are developing STING pathway activator product candidates, including ADU-S100 (MIW815), in oncology under our worldwide collaboration with Novartis Pharmaceuticals Corporation, or Novartis. ADU-S100, the first STING pathway activator to enter the clinic, is being evaluated in a Phase 1 clinical trial as a single agent and in an ongoing Phase 1b combination trial with spartalizumab (PDR001), an investigational anti-PD-1 monoclonal antibody, in patients with cutaneously accessible metastatic solid tumors or lymphomas. Preliminary results and observations from these trials were presented at the Society for Immunotherapy of Cancer's (SITC) 33rd Annual Meeting in November 2018. We also have initiated a Phase 1 trial of ADU-S100 in combination with YERVOY® (ipilimumab), an approved anti-CTLA-4 antibody for the treatment of relapsed and refractory melanoma. We expect to initiate a Phase 1b/2 clinical trial of ADU-S100 with an approved anti-PD-1 monoclonal antibody in patients with squamous cell carcinoma of the head and neck (SCCHN) in the second half of 2019.

APRIL is a soluble factor that binds to B-cell maturation antigen, or BCMA, and transmembrane activator and CAML interactor, or TACI, receptors thereby inducing signaling, and is implicated in IgA nephropathy, multiple myeloma and other indications. BION-1301, a first-in-class fully blocking monoclonal antibody that blocks APRIL binding to both the BCMA and TACI receptors, is being evaluated in an ongoing Phase 1/2 clinical trial for multiple myeloma. We expect to initiate a Phase 1 clinical trial of BION-1301 in healthy volunteers as part of our plan to evaluate BION-1301 in IgA nephropathy in the first half of 2019.

In addition to our current STING pathway product candidates that activate the STING receptor, we are developing product candidates that are designed to prevent or control immune responses through the STING pathway as part of our cGAS-STING pathway inhibitor program. In December 2018, we entered into a research collaboration and exclusive license agreement with Eli Lilly and Company, or Lilly, for our cGAS-STING pathway inhibitor program for the research and development of novel inhibitor product candidates for autoimmune and other inflammatory diseases.

We have intellectual property protection on our STING and APRIL technologies and each of our product candidates, some of which we believe can be maintained into 2039.

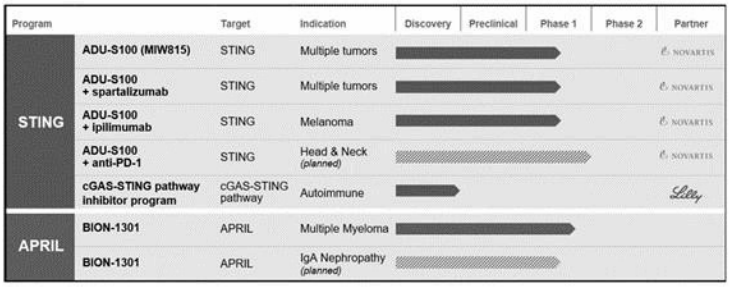
Our Strategy

We aim to discover, develop and commercialize therapies to treat challenging diseases based on our STING and APRIL pathway technologies. Key elements of our strategy include:

- **Rapidly advance therapies from our STING and APRIL technologies through discovery, clinical development and regulatory approval.** We are developing novel drug candidates by leveraging our proprietary technologies and understanding of the STING and APRIL pathways. We have proprietary technologies that we believe can generate novel and combinable therapies to target disease indications with significant unmet medical need.
- **Expand on the value of our product candidates through partnerships.** We may decide to selectively partner product candidates in certain geographies and where we believe a partner could bring additional resources and expertise to maximize the value of our product candidates. We have strategic partnerships with Novartis for STING pathway activator product candidates in oncology, Lilly for cGAS-STING pathway inhibitor product candidates and Merck to advance an anti-CD27 antibody. We believe these partnerships have the potential to drive significant value through the extensive capabilities of these organizations.

- **Maximize the value of our proprietary STING and APRIL pathway programs through the retention of commercial rights in key markets.** We retain U.S. commercial rights for STING pathway activator product candidates in oncology developed in collaboration with Novartis. In addition, we maintain full ownership of our APRIL pathway product candidates.
- **Leverage the expertise of our scientific founders and key advisors to develop innovative technologies at the forefront of immunotherapy.** Our scientific founders and advisors are from some of the world's leading research institutions and have a history of seminal discoveries and significant experience in oncology and immunotherapy. As such, we plan to continue to leverage the collective talent of our scientists, clinicians and a network of highly influential advisors to inform our development strategy and enable our technology to be at the forefront of immunotherapy. We strive to protect our commercially important discoveries and product candidates by applying for, maintaining, and defending our patent rights.

Our Pipeline



STING Pathway Technology

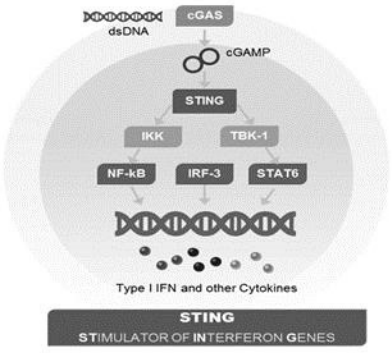
We believe key attributes of our STING pathway technology include:

- *Early Evidence of Potency.* Our STING pathway activator product candidates have demonstrated significant anti-tumor activity in preclinical studies as well as early clinical activity.
- *Novel Mechanism.* Our STING Pathway activator product candidates are designed to initiate broad and strong innate and adaptive immune responses through the activation of the STING receptor signaling pathway.
- *Versatility of Delivery.* We believe our STING pathway activator product candidates can be delivered via intratumoral injection, and potentially via new systemic delivery formulations and other novel modalities.
- *Combinability.* Based on their mechanism of action and results from preclinical studies and observations from early clinical studies, we believe our STING pathway activator product candidates may have synergistic or additive benefits of immune-mediated tumor killing mechanisms when combined with conventional and novel therapies, such as chemotherapy, radiotherapy and checkpoint inhibitors, among others.
- *Ease of Manufacture.* Our STING pathway activator product candidates are small molecules manufactured through a relatively simple and cost-effective process.
- *Broad Applicability.* We believe our STING pathway product candidates have broad application in oncology as well as autoimmune and inflammatory diseases.

The STING receptor is known to be a central mediator of innate immunity and is critical for immune surveillance. Recent advancements reported in numerous leading scientific journals have generated significant interest and rationale for targeting the STING receptor as a novel therapeutic approach to immuno-oncology. We are developing a portfolio of synthetic proprietary small molecule immune modulators that target and activate the STING receptor with application across diverse diseases. The STING receptor is generally expressed at high levels in immune cells, including dendritic cells, or DCs, and many other cells in the body. Once activated, the STING receptor initiates a profound innate immune response by signaling through at least three distinct pathways, inducing the expression of a broad profile of cytokines, including interferons and chemokines. In addition to this cytokine profile, the enhanced tumor antigen-presenting capacity subsequently leads to the development of an effective tumor antigen-specific T cell adaptive immune response. We are also pursuing product opportunities that downregulate the STING pathway.

Naturally occurring cyclic dinucleotides, or CDNs, that target the STING receptor are produced by bacteria that secrete CDNs into the host cell or by mammalian cells through cyclic GMP-AMP synthetase, or cGAS. cGAS is a receptor that senses double-stranded (ds) DNA in the cytosol of antigen presenting cells, or APCs, and in response synthesizes a CDN that is structurally distinct from the CDNs produced by bacteria. While both bacterial- and cGAS-produced CDNs target and activate the STING receptor, CDNs produced by cGAS bind more tightly to STING than CDNs produced by bacteria. This stronger binding triggers a larger and more stable change in shape of the STING receptor, leading to the development of a more effective tumor antigen-specific immune response. Additionally, while some of the five known STING alleles in humans respond poorly to CDNs produced by bacteria, all respond to CDNs produced by cGAS. We are advancing through development novel synthetic STING pathway product candidates that are active in all five known human STING alleles.

We have developed proprietary STING pathway activator derivative compounds that are significantly more potent than the natural cGAS-produced molecules, which can be demonstrated by comparing the expression levels the cytokines produced from signaling through three distinct pathways. The NF-kB pathway induces the expression of numerous pro-inflammatory cytokines, including IL-6 and TNFa that stimulate a variety of immune cells. The IRF-3 pathway leads to the induction of IFN-b and co-regulated genes, which orchestrates diverse innate immune responses. The STAT6 pathway leads to expression of chemokines, including CCL2 and CCL20 that are involved in immune cell recruitment. The unique profile of cytokines induced through activating the STING receptor results in strong efficacy in numerous aggressive preclinical mouse models of cancer.



In healthy individuals, DCs and other APCs constantly sample nearby tumor and non-tumor cells. However, in cancer patients, tumors can produce immune-inhibitory molecules which can make the DCs non-functional. We believe the activation of the STING receptor in the tumor microenvironment by intratumoral injection of our proprietary STING pathway activator product candidates stimulate the maturation of the DCs, leading to the presentation of antigens found on the individual's unique tumor. The activated tumor-specific T cells induce tumor cell death both locally and systemically, resulting in significant and durable therapeutic efficacy in preclinical tumor models.

STING Pathway Product Candidates

We envision multiple STING pathway product opportunities, particularly in combination with other treatments. In preclinical animal models, our data have shown that our proprietary STING pathway activator product candidates can be combined with designated recombinant proteins to induce potent antigen-specific CD4+ T cells, which recognize foreign antigens and assist in the immune response, and CD8+ T cells, which recognize and destroy cells expressing foreign antigens. We believe our STING pathway product candidates can also be combined with conventional cancer treatments such as chemotherapy and radiotherapy to enhance immune-mediated tumor killing mechanisms. We also believe that our STING pathway product candidates could alter the nature of the tumor microenvironment, thus allowing for improved responses to checkpoint inhibitors.

In addition, our STING pathway product candidates directly activate natural killer cells and could enhance Antibody-Dependent Cellular Cytotoxicity, or ADCC, tumor cell killing mechanisms, which are a significant mechanism of action of several established monoclonal antibody therapies. Another possible opportunity would be to directly conjugate our STING pathway activator product candidates to enhance ADCC.

ADU-S100

Our lead STING pathway product candidate is ADU-S100 (also known as MIW815), which differs from naturally occurring CDNs through the provision of proprietary modifications designed to optimize stability, STING receptor binding affinity and potency, without significant toxicity. In March 2015, we entered into a worldwide collaboration with Novartis to further advance the research and development of STING pathway product candidates in oncology.

ADU-S100 Preclinical Studies

In preclinical mouse tumor models, Intratumoral, or IT, injection of ADU-S100 induced tumor shrinkage and generated substantial immune responses capable of providing long-lasting systemic antigen-specific T cell immunity to prevent further growth of distal, untreated tumor metastases, a response known as an abscopal effect. Further preclinical studies demonstrated that the abscopal effect is entirely STING receptor-dependent. These data provide the rationale for advancing this novel molecule for the treatment of locally advanced or metastatic cancers.

Further rationale for the approach of IT injection of ADU-S100 is the recent discovery that the STING-dependent innate immune sensing in the tumor microenvironment is a critical step in promoting spontaneous tumor-initiated T cell priming, subsequent infiltration of tumor lymphocytes and tumor regression. Analyses conducted with tumors isolated from melanoma patients have also revealed that tumors containing infiltrating activated T cells are characterized by an IFN gene signature. Studies in mice have demonstrated that IFN-ß signaling plays a critical role in tumor-initiated T cell priming. We believe that treatment strategies to induce IFN-ß signaling and DC activation in the tumor microenvironment to bridge the innate and adaptive immune responses have significant therapeutic potential. IT delivery of our synthetic STING pathway activator product candidates activate a tumor-specific T cell response that is unique to the individual's tumor; conceptually, a small molecule approach to patient-specific immuno-oncology treatments.

We are advancing development of ADU-S100 in multiple clinical trials designed to further assess its potential.

Phase 1 ADU-S100 (Ongoing)

A Phase 1 dose escalation and dose expansion clinical trial with ADU-S100 is ongoing in collaboration with Novartis. The trial is designed to evaluate the safety, tolerability and clinical activity of ADU-S100 in patients with advanced, metastatic treatment-refractory solid tumors or lymphomas. In this multicenter, open-label trial, ADU-S100 is administered intratumorally on Days 1, 8 and 15 of a 28-day cycle.

The Phase 1 monotherapy trial of ADU-S100 is being conducted in a heterogeneous and heavily pre-treated patient population. Preliminary results from the 50 – 3200 mcg dose cohorts of this ongoing monotherapy trial were presented at the SITC 33rd Annual Meeting in November 2018.

Preliminary signs of clinical activity were seen in several patients, including some who received prior checkpoint inhibitor therapy. The results indicated ADU-S100 is safe and well-tolerated. Target engagement of ADU-S100 and activation of the STING pathway was demonstrated by increases in key systemic cytokines, including IL-6, MCP-1 and IFN-β, observed after administration. Over 20 types of cancer have been treated in this trial, including Merkel cell, parotid gland, colorectal, endometrial, ER+ and triple-negative breast cancer, esophageal, collecting duct carcinoma, ovarian, Hodgkin's disease, hemangioepithelioma and other cancers. Enrollment is ongoing for additional patient cohorts.

We and Novartis are continuing to evaluate additional pathology and other biomarkers to assess the pharmacological activity of ADU-S100 in patients.

Phase 1 ADU-S100 in Combination with Spartalizumab (Ongoing)

A Phase 1b dose escalation and dose expansion clinical trial is ongoing to evaluate the safety and preliminary efficacy of ADU-S100 in combination with spartalizumab (PDR001), Novartis' investigational anti-PD-1 monoclonal antibody. The multicenter, open-label trial is currently enrolling patients with advanced, metastatic treatment-refractory solid tumors or lymphomas and is evaluating two treatment schedules of ADU-S100 in dose escalation with a fixed dose of spartalizumab. Patients in Group A receive a fixed dose of intravenous spartalizumab on day 1 and an intratumoral injection of ADU-S100 three times (day 1, 8, 15) in a 28-day cycle. Patients in Group B receive a fixed dose of intravenous spartalizumab on day 1 and an intratumoral injection of ADU-S100 on day 1 of every 28-day cycle. The dose escalation combination trial is enrolling patients with multiple cancers and who have received multiple lines of prior therapies, including prior immunotherapy.

Preliminary observations from the 50 – 400 mcg dose cohorts of the ongoing study of ADU-S100 in combination with spartalizumab included:

- clinical responses observed in several tumor types, including a subset of patients who had previously demonstrated responses to checkpoint inhibitor therapy alone;
- reduced tumor volume in injected and non-injected lesions in some patients;
- several patients remained on study longer than 6 months; and
- safety profile consistent with what has been observed in the ADU-S100 monotherapy study.

Melanoma Overview

Melanoma is the most serious form of skin cancer that develops in cells called melanocytes that make melanin, the pigment that gives skin its natural color. Melanomas can develop anywhere on the body and most often develop in areas that have had exposure to the sun, such as the back, legs, arms and face. Often, the first signs and symptoms of melanoma include a change in the size, shape, color, or feel of a mole or the development of new pigmented or unusual growth on the skin. The incidence of melanoma increases with age. Melanoma represents 5.3 percent of all new cancer cases in the United States and is the fifth most common type of cancer in men and women of all age groups. According to the American Cancer Society, it is estimated that there will be 96,480 new cases of melanoma in the United States and 7,230 deaths from the disease. According to the World Health Organization, approximately 132,000 new cases of melanoma are diagnosed worldwide each year.

Phase 1 ADU-S100 in Combination with ipilimumab in Melanoma (Ongoing)

In 2018, the protocol for investigation of ADU-S100 as a single agent was amended to include a study arm evaluating ADU-S100 in combination with ipilimumab, an approved anti-CTLA-4 antibody for the treatment of relapsed and refractory melanoma. This is the first clinical trial evaluating ADU-S100 in a homogenous patient population. The ongoing multicenter trial is enrolling advanced melanoma patients who have relapsed after or are refractory to treatment with anti-PD-1 antibodies, nivolumab or pembrolizumab. During the ongoing dose escalation phase of the trial, ipilimumab will be administered at its approved dose and schedule, while the dose of ADU-S100 will be escalated. ADU-S100 is administered intratumorally on Days 1 and 8 of each 21-day cycle (starting dose 200 mcg) and ipilimumab (3 mg/kg) is administered intravenously on day 1 of each 21-day cycle for the first 4 cycles. The dose expansion phase of the trial will evaluate the optimized dose of ADU-S100 in combination with ipilimumab in two expansion cohorts that will enroll patients with cutaneously and viscerally accessible melanoma.

Head and Neck Cancer Overview

Cancers that are known collectively as head and neck cancers often begin in the squamous cells that line the moist, mucosal surfaces inside the head and neck, including the oral cavity, larynx, nasal cavity, paranasal sinuses, thyroid and salivary glands. These squamous cell cancers are often referred to as squamous cell carcinoma of the head and neck, or SCCHN. The symptoms of head and neck cancers may include a lump or a sore that does not heal, a sore throat that does not go away, difficulty in swallowing and a change or hoarseness in the voice. SCCHN accounts for over 90 percent of head and neck cancers and is the sixth most common cancer by incidence worldwide. Each year, SCCHN is diagnosed in more than 600,000 people globally, with 50,000 new cases and more than 10,000 deaths occurring in the United States alone. Rates of death due to SCCHN have declined only slightly in the United States over the past three decades, and the all-stage survival rates of 61 percent at five years and 50 percent at 10 years illustrate the need for improved therapy.

Phase 1b/2 ADU-S100 in Combination with anti-PD-1 antibody in SCCHN (Planned)

We expect to initiate a Phase 1b/2 clinical trial of ADU-S100 in combination with an approved anti-PD-1 antibody in patients with SCCHN in the second half of 2019.

cGAS-STING Pathway Inhibitor Program

In addition to our current STING pathway product candidates that activate the STING receptor, we are developing product candidates that are designed to prevent or control immune responses through the STING pathway. We believe these product candidates may have broad application in the treatment of autoimmune and inflammatory diseases. In December 2018, we entered into a research collaboration and exclusive license agreement with Lilly for our cGAS-STING Pathway Inhibitor program for the research and development of novel product candidates for autoimmune and other inflammatory diseases.

The presence of cytosolic DNA from pathogens or mislocalization of self-DNA is detected by cGAS. Upon binding DNA, cGAS produces a CDN that activates STING and induces expression of type I interferons and other interferon-stimulated genes. Pathological conditions leading to mislocalized cytosolic DNA or genetic mutations that activate components of the cGAS-STING pathway can lead to overproduction of type I interferons. Our cGAS-STING pathway inhibitor product candidates are small molecules that are being designed to bind and block the signaling that channels through the pathway to reduce excessive type 1 interferon production that drive certain autoimmune and inflammatory diseases. These small molecules originate from several high throughput screens and are further optimized to impart adequate potency and systemic bioavailability.

APRIL Pathway Technology

We believe key attributes of our APRIL pathway technology include:

- *Early Evidence of Potency.* BION-1301, a humanized antibody that blocks APRIL from binding to both the BCMA and TACI receptors, has been shown in preclinical studies to inhibit multiple myeloma tumor growth, drug resistance and immune suppression. BION-1301 has also been shown in preclinical studies to reduce serum IgA levels in mice and monkeys, demonstrating compelling rationale for its use in IgA nephropathy.
- *Novel Mechanism.* Blocking APRIL is a distinct approach to inhibit both the BCMA and TACI receptors that appears to have immunomodulatory properties.
- *Versatility.* APRIL is implicated in the pathogenesis of multiple indications including IgA nephropathy and multiple myeloma.
- *Ease of Manufacture.* BION-1301 is a biologic that can be manufactured through well-established processes.
- *Broad Applicability.* BION-1301 is a monoclonal antibody, an established therapeutic class to treat cancer as well as autoimmune diseases.

APRIL plays a crucial part in the protective bone marrow tumor microenvironment. APRIL is a ligand for the BCMA and TACI receptors and mediates important B-cell functions. APRIL serum levels are enhanced in patients diagnosed with IgA nephropathy and multiple myeloma (MM). APRIL-driven IgA production in IgA nephropathy has been demonstrated in preclinical studies. In an IgA nephropathy mouse model, blocking APRIL prevents an increase in proteinuria and decreases serum IgA. In preclinical studies, APRIL was also shown to be critically involved in the survival, proliferation and chemoresistance of multiple myeloma tumor cells through binding of its receptor BCMA, and APRIL upregulated mechanisms of immune resistance, involving PD-L1, IL-10, TGF-β and other factors in this model.

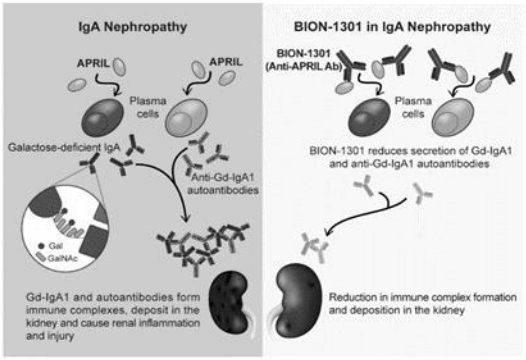
APRIL Product Candidates

BION-1301

BION-1301 is a first-in-class, fully blocking humanized monoclonal anti-APRIL antibody and is being developed as a novel therapy for IgA nephropathy and multiple myeloma. BION-1301 blocks APRIL from binding to both the BCMA and TACI receptors, and has been shown in preclinical studies to reduce serum IgA levels in mice and monkeys. BION-1301 has also been shown in preclinical models to halt tumor growth and overcome resistance to MM drugs such as lenalidomide and bortezomib. In addition, BION-1301 has been shown in preclinical studies to inhibit immune suppressive effects of regulatory T cells via TACI.

IgA Nephropathy Overview

IgA nephropathy is a kidney disease characterized by the accumulation of autoantibodies binding to galactose-deficient immunoglobulin A (IgA) leading to deposition of immune complexes in the glomeruli of the kidneys. This results in inflammation that damages the glomeruli, causing proteinuria and microscopic hematuria. Among patients who develop overt proteinuria and/or an elevated serum creatinine concentration, progression to end-stage renal disease (ESRD) is approximately 15 to 25 percent at 10 years and 20 to 30 percent at 20 years. No cure currently exists for IgA nephropathy and treatments are targeted towards preventing progression to ESRD and alleviating symptoms. IgA nephropathy is the most prevalent primary chronic glomerular disease worldwide. While prevalence varies geographically, biopsy and dialysis registry data suggest a higher incidence of IgA nephropathy in East Asian populations and lower incidence in African populations. Variations in disease prevalence may reflect regional differences in screening for kidney disease and kidney biopsy practices. Many patients with IgA nephropathy are detected on routine urine screening because their only clinical manifestation is asymptomatic hematuria and/or proteinuria. Prevalence may therefore appear to be higher in countries with an active urine testing program and a low threshold for the performance of renal biopsy in patients with isolated asymptomatic hematuria, such as Japan and Korea, where testing is routinely performed in schools and in the workplace. Conversely, clinicians in North America seldom biopsy a patient with isolated hematuria or mild proteinuria, resulting in an apparently lower disease prevalence.



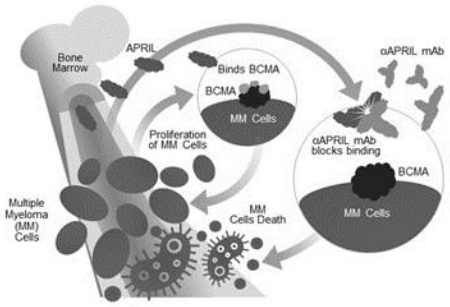
Phase 1 BION 1301 in IgA Nephropathy (Planned)

In the first half of 2019, we expect to initiate a Phase 1 clinical trial of BION-1301 in IgA nephropathy in healthy volunteers followed by IgA nephropathy patients at a later date. The primary objectives of this clinical trial are to:

- Assess the safety profile of BION-1301 in healthy volunteers and IgA nephropathy patients,
- Determine the PK/PD relationship in healthy volunteers and IgA nephropathy patients, and
- Establish proof-of-mechanism.

Multiple Myeloma Overview

Multiple myeloma is a cancer formed by malignant plasma cells. Normal plasma cells are found in the bone marrow and are an important part of the immune system. Often no symptoms are initially noticed, but when the disease is advanced, fractures, bone pain, frequent infections, kidney dysfunction and anemia may occur. Complications may include amyloidosis. Globally, the 2016 prevalence of multiple myeloma was estimated at 130,000 and the annual mortality was approximately 98,437. In the United States, the 2018 incidence was estimated at 30,770 new cases and the annual mortality was approximately 12,770. Despite new treatments recently approved in multiple myeloma, this disease remains incurable as patients relapse or become resistant to currently-available therapies.



Phase 1/2 BION-1301 in Multiple Myeloma (Ongoing)

In December 2017, we initiated a Phase 1/2 clinical trial of BION-1301 in multiple myeloma. The Phase 1/2 is a two-part, multi-center, open-label study designed to evaluate the safety and activity of BION-1301 in patients with relapsed or refractory multiple myeloma whose disease has progressed after at least three prior systemic therapies, including immunomodulatory drugs, or iMiDs, proteasome inhibitors, chemotherapies or monoclonal antibodies. The Phase 1 part of the study is evaluating the safety, pharmacokinetics and pharmacodynamics of escalating doses of BION-1301.

Other Programs

Anti-CD27 Antibody

CD27 is a co-stimulatory receptor expressed on different immune cells, such as T-lymphocytes and NK cells. It has been recognized as having a critical role in priming, enhancing and sustaining a productive anti-cancer (CD8 T-cell) adaptive immune response. In preclinical studies, anti-CD27 activation in combination with immune checkpoint inhibition has demonstrated enhanced tumor rejection. Our anti-CD27 antibody is exclusively licensed to Merck and is being advanced under our license agreement in Phase 1 clinical development. We believe our anti-CD27 antibody is distinct because it targets a functional epitope on CD27 that has demonstrated potent activation of the CD27 co-stimulatory pathway in preclinical studies.

Manufacturing

We rely on third-party contract manufacturing organizations, or CMOs, to produce our product candidates for clinical use and currently do not own or operate manufacturing facilities. We have established manufacturing processes and supply and quality agreements for all of the investigational agents used in our ongoing clinical trials. We require that our CMOs produce bulk drug substances and finished drug products in accordance with current Good Manufacturing Practices, or cGMPs, and all other applicable laws and regulations. We may continue to rely on CMOs to manufacture our products for commercial sale. We maintain agreements with potential and existing manufacturers that include confidentiality and intellectual property provisions to protect our proprietary rights.

STING Pathway Activator Product Candidates

Manufacturing of our STING Activator product candidates generally encompasses both the chemical synthesis of the active pharmaceutical ingredient, or API, and its formulation and fill/finish of the final product. The synthetic process for the manufacture of our STING Activator product candidates is a trade secret and we retain control and ownership of the process. We have contracts with a CMO to produce, release and stability test the ADU-S100 API and drug product. Under our collaboration agreement with Novartis, Novartis has manufacturing rights for the manufacture of ADU-S100.

APRIL Pathway Candidates

Manufacturing of B-select product candidates includes generation of engineered cell lines that express and secrete the antibody product candidates. After selection of clones that secrete the desired amounts of product candidates, cell banks are generated and stored to preserve identity and characteristics. Process development, upstream and downstream, is undertaken to select optimal conditions for growth and productivity, quality standards and yield. In addition, activities are undertaken to identify formulation composition to establish stability characteristics. We contract with a CMO to develop, produce and release drug substance and drug product for our antibody candidates targeting APRIL and CTLA-4.

Intellectual Property

Intellectual property is of vital importance in our field and in biotechnology generally. We seek to protect and enhance proprietary technology, inventions, and improvements that are commercially important to the development of our business by seeking, maintaining, and defending patent rights, whether developed internally or licensed from third parties. We will also seek to rely on protections afforded through data exclusively, patent term extensions and regulatory exclusivity, where available.

Through licensing and through developing our own portfolio, we have rights to more than 150 issued patents and more than 300 pending applications in the United States and foreign countries. Patent families within the portfolio are directed to our STING and APRIL technologies as well as our other non-core programs.

STING Pathway Technology

We own and license families of patents and patent applications directed to our STING pathway product candidates, which expire, or if issued would expire, between 2025 and 2039. In particular, we own two issued U.S. patents that expire in 2034; two pending U.S. patent applications and corresponding pending foreign patent applications directed to stereochemically pure cyclic purine dinucleotides and certain other substituted cyclic purine dinucleotides, which if issued would expire in 2033 and 2034, respectively; and three pending U.S. patent applications and corresponding pending foreign patent applications, and one international application directed to certain substituted cyclic purine dinucleotides, which if issued would expire in 2036, 2037 and 2038, respectively, not including any patent term extensions that may be available under U.S. laws and assuming continued payment of any applicable fees. Within this portfolio are U.S. and international patent applications directed to compositions and methods for activating STING utilizing our STING pathway product candidates that are jointly owned with the Regents of the University of California, and which, if issued, would expire in 2034. We also license a family of patents from Karagen Pharmaceuticals directed to certain STING pathway molecules and their use in modulating immune response in a patient, which expire in 2025, not including any patent term extensions that may be available under U.S. laws and assuming continued payment of any applicable fees; a family of patents from the Regents of the University of California also directed to certain STING pathway molecules and their uses that, if issued, would expire in 2034; and a family of patents from a consortium of universities led by Memorial Sloan Kettering also directed to certain STING pathway molecules and their uses, with two issued U.S. patents, and corresponding pending foreign patent applications that, if issued, would expire in 2034.

Antibody Product Candidates

We own five issued U.S. patents, eight pending U.S. patent applications, including corresponding foreign issued patents and patent applications, and one priority filing to cover our antibody product candidates and use thereof. The issued U.S. patents that we own expire between 2030 and 2036, not including any patent term extensions that may be available under U.S. laws. Regarding the pending patents application, if these claims were to be issued, they could extend protection for such products until 2040.

cGAS-STING Pathway Inhibitor Program

We own two issued U.S. patents and two pending U.S. patent application, including corresponding foreign issued patents and patent applications, and two priority filings to cover our cGAS-STING Pathway Inhibitor product candidates and use thereof. The issued U.S. patents that we own expire in 2034, not including any patent term extensions that may be available under U.S. laws. Regarding the pending patents applications and priority filings, if these claims were to be issued, they could extend protection for such products until 2039.

General Considerations

As with other biopharmaceutical companies, our ability to maintain and solidify a proprietary position for our product candidates will depend upon our success in obtaining effective patent claims that cover such product candidates and their intended methods of use, and enforcing those claims once granted.

The term of a patent that covers an FDA-approved drug or biologic may be eligible for patent term extension, which provides patent term restoration as compensation for the patent term lost during the FDA regulatory review process. The Drug Price Competition and Patent Term Restoration Act of 1984, or the Hatch-Waxman Act, permits a patent term extension of up to five years beyond the expiration of the patent. The length of the patent term extension is related to the length of time the drug or biologic is under regulatory review. Patent extension 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 extended. Similar provisions are available in Europe and other foreign jurisdictions to extend the term of a patent that covers an approved drug or biologic. In the future, if and when our biopharmaceutical products receive FDA approval, we expect to apply for patent term extensions on patents covering those products.

Certain of our product candidates may be subject to The Biologics Price Competition and Innovation Act of 2009, or BPCIA. The BPCIA established an abbreviated pathway for the approval of biosimilar and interchangeable biological products. The new abbreviated regulatory pathway establishes legal authority for the FDA to review and approve biosimilar biologics, including the possible designation of a biosimilar as "interchangeable" based on their similarity to an existing brand product. Under the BPCIA, an application for a biosimilar product cannot be approved by the FDA until twelve years after the original branded product was approved under a BLA. The BPCIA is complex and is still in the process of being interpreted and implemented by the FDA. As a result, its ultimate impact and implementation are subject to uncertainty.

Many biopharmaceutical companies, biotechnology companies and academic institutions are competing with us in the field of oncology and filing patent applications potentially relevant to our business. Even when a third-party patent is identified, we may conclude upon a thorough analysis, that we do not infringe upon the patent or that the patent is invalid. If the third-party patent owner disagrees with our conclusion, we may be subject to patent litigation. Alternatively, we might decide to initiate litigation in an attempt to have a court or tribunal declare the third-party patent invalid or non-infringed by our activity. In either scenario, patent litigation typically is costly and time-consuming, and the outcome can be favorable or unfavorable.

In addition to patents, we rely upon unpatented trade secrets, know-how and continuing technological innovation to develop and maintain a competitive position. We seek to protect our proprietary information, in part, through confidentiality agreements with our employees, collaborators, contractors and consultants, and invention assignment agreements with our employees. We also have agreements with some of our consultants that require them to assign to us any inventions created as a result of their working with us. The confidentiality agreements are designed to protect our proprietary information and, in the case of agreements or clauses requiring invention assignment, to grant us ownership of technologies that are developed through a relationship with a third party.

Our commercial success will depend in part upon not infringing upon the proprietary rights of third parties. It is uncertain whether the issuance of any third-party patent would require us or our licensee(s) to alter our development or commercial strategies, obtain licenses or cease certain activities. The biopharmaceutical industry is characterized by extensive litigation regarding patents and other intellectual property rights. If a third party commences a patent infringement action against us, or our licensee(s), it could consume significant financial and management resources, regardless of the merit of the claims or the outcome of the litigation.

We may rely, in some circumstances, on trade secrets to protect our technology. However, trade secrets can be difficult to protect. 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. It is possible that these 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.

Collaborations

Novartis Agreement

In March 2015, we entered into a collaboration and license agreement with Novartis Pharmaceuticals Corporation, or Novartis, pursuant to which we are collaborating worldwide with Novartis regarding the development and commercialization of product candidates containing an agonist of the molecular target known as STING in the field of oncology, including immuno-oncology and cancer vaccines. Under this agreement, or the Novartis Agreement, we granted Novartis a co-exclusive license to develop such products worldwide, an exclusive license to commercialize such products outside the United States and a non-exclusive license to support us in commercializing such products in the United States if we request such support. The collaboration is guided by a joint steering committee with each party having final decision making authority regarding specified areas of development or commercialization.

Under the Novartis Agreement, we received an upfront payment of $200.0 million from Novartis in April 2015. In 2016, we earned a $35.0 million development milestone upon initiation of a Phase 1 trial for the first STING product candidate, ADU-S100. We are eligible to receive up to an additional $215.0 million in development milestones and up to an additional $250.0 million in regulatory approval milestones.

We are responsible for 38% of the joint development costs worldwide and Novartis is responsible for the remaining 62% of the joint development costs worldwide.

We will also receive 50% of gross profits on sales of any products commercialized pursuant to this collaboration in the United States and 45% of gross profits for specified European countries and Japan. For each of these profit share countries, each party will be responsible for its respective commercial sharing percentage of all joint commercialization costs incurred in that country.

For all other countries where we are not sharing profits, Novartis will be responsible for all commercialization costs and will pay us a royalty in the mid-teens on all net sales of product sold by Novartis, its affiliates and sublicensees, with such percentage subject to reduction post patent and data exclusivity expiration and subject to reduction, capped at a specified percentage, for royalties payable to third party licensors. Novartis' royalty obligation will run on a country-by-country basis until the later of expiration of the last valid claim covering the product, expiration of data exclusivity for the product or 12 years after first commercial sale of the product in such country.

With respect to the United States, specified European countries and/or Japan, we may elect for such region to either reduce by 50% or to eliminate in our development and commercialization cost sharing obligation. If we elect to reduce our cost sharing percentage by 50% in any such region, then our profit share in such region will also be reduced by 50%. If we elect to eliminate our development cost sharing obligation, then such region will be removed from the profit share, and instead Novartis will owe us royalties on any net sales of product for such region, as described above.

Lilly Agreement

On December 18, 2018, we entered into a research collaboration and exclusive license agreement with Lilly for our cGAS-STING Pathway Inhibitor program for the research and development of novel immunotherapies for autoimmune and other inflammatory diseases. Pursuant to this agreement, or the Lilly Agreement, we granted an exclusive and worldwide license under certain intellectual property rights controlled by us to research, develop, manufacture and commercialize certain cGAS-STING products for the treatment of autoimmune and other inflammatory diseases. The license granted is sublicensable during a specified time period.

Under the terms of the Lilly Agreement, we received an upfront payment of $12.0 million in the first quarter of 2019 and will be eligible for development and commercial milestones of up to approximately $620.0 million per product. Lilly is also obligated to pay us tiered royalty payments at percentages in the single to low-double digits based on annual net sales of the licensed products. Lilly must pay such royalties on a product-by-product and country-by-country basis until the latest to occur of (i) the expiration of the last-to-expire valid claim of certain patents, (ii) the expiration of the data exclusivity period in such country or (iii) a specified anniversary of the first commercial sale of such product in such country. We will be reimbursed for up to a certain amount of research funding spent during the research term. In addition, we have the option to co-fund the clinical development of each product in exchange for an increase in royalty payments and a reduction in certain milestone payments to the extent relevant to such co-funded product. Lilly will be responsible for all costs of global commercialization.

The Lilly Agreement will remain in effect until the expiration of all payment obligations and may be terminated by Lilly following specified notice period, or by either party in the event of an uncured material breach of the other party or bankruptcy of the other party.

Merck Agreement

In connection with the acquisition of Aduro Biotech Europe Holdings, Europe B.V., or Aduro Biotech Europe, in October 2015, we became party to an Exclusive Patent and Know How License and Research Collaboration Agreement with Merck Sharp and Dohme B.V., or Merck, pursuant to which we have exclusively licensed our anti-CD27 antibody to Merck. This agreement, or the Merck Agreement, sets forth the parties' respective obligations for development, and commercialization of certain antibody product candidates.

Since the execution of the Merck Agreement, we have received $5.0 million in connection with achievement of development milestones for our anti-CD27 antibody. Under the Merck Agreement we are eligible to receive future contingent payments, including up to $307.0 million in potential development milestone payments, and up to $135.0 million in commercial and net sales milestones for a product candidate. In addition, we are eligible to receive royalties in the mid-single digits to low teens based on net sales of the product.

Janssen ADU-214, ADU-741 and GVAX Prostate Agreements

On September 25, 2018, we received written notices of termination from Janssen Biotech, Inc., or Janssen, for its Research and License Agreements pertaining to our proprietary attenuated strains of Listeria for treatment of lung and prostate cancers. Specifically, Janssen delivered notice for the following agreements, or the Janssen Agreements: (i) the Research and License Agreement, dated as of October 13, 2014, as amended by the Amendment to Research and License Agreements, dated as of November 11, 2015, or the Amendment; (ii) the Research and License Agreement, dated as of May 27, 2014, as amended by the Amendment; and (iii) the GVAX Prostate License Agreement, dated as of May 27, 2014. The terminations were effective December 24, 2018.

Under the terms of the Janssen Agreements, we granted Janssen an exclusive, worldwide license to research, develop, manufacture, use, sell and otherwise exploit products containing ADU-214, ADU-741 and GVAX Prostate for any and all uses. We also granted Janssen exclusive rights to develop products utilizing our proprietary attenuated strains of Listeria for treatment of lung and prostate cancers. We previously received upfront license fees of $42.5 million and milestone payments of $31.0 million upon completion of various development activities and were eligible to receive future contingent payments based on development, regulatory and commercial milestones as well as royalties on any net sales of licensed products by Janssen under each of the Janssen Agreements. Pursuant to the terms of the Janssen Agreements, upon Janssen's termination, we regained worldwide rights for the development and commercialization of products containing ADU-214, ADU-741 and GVAX Prostate for any and all uses.

Our Research and Development and License Agreements

STING Pathway License Agreements

Karagen Agreement

In June 2012, we entered into a license agreement with Karagen Pharmaceuticals, Inc., or Karagen, pursuant to which Karagen granted us an exclusive, worldwide, sublicenseable license under certain patents and know-how related to STING pathway technologies to make, develop, use and commercialize products for use in the therapeutic and/or prophylactic treatment of cancer or precancerous conditions and a non-exclusive license to such patents and know-how to make, develop, use and commercialize products for all other uses. Under the agreement, or the Karagen Agreement, we were also granted an option to designate a particular disease or condition to be added to the field of use under our exclusive license. Under the Karagen Agreement, we are obligated to use commercially reasonable efforts to develop and commercialize licensed products in the United States and the European Union.

Under the Karagen Agreement, we are required to make milestone payments totaling up to $900,000, in aggregate, for the achievement of specified development and regulatory milestones as well as royalties based on net sales of products by us, our affiliates and sublicensees at rates ranging in the low single-digit percentages, determined by whether the disease field is an exclusive or non-exclusive disease field, subject to minimum annual royalties and standard reductions. In addition, we are required to pay Karagen a percentage of consideration received from any sublicensing arrangements ranging from the mid-single digits to the mid-teen digits determined by the current stage of development of the relevant licensed product at the time of the sublicense grant, or by whether we have exercised our option to add a designated field of use to its exclusive license, as applicable.

The Karagen Agreement will expire, on a country-by-country basis, upon the expiration of the last-to-expire valid claim within the licensed patent rights. Either party may terminate the Karagen Agreement upon 90 days' advance written notice in the event of the other party's material breach that is not cured within such 90-day period, and immediately upon notice in the event of the other party's bankruptcy or insolvency. Additionally, we may terminate the Karagen Agreement at will upon 90 days' advance written notice to Karagen.

UCB Vance Agreement

In September 2014, we entered into a license agreement with UC Berkeley, granting us an exclusive, worldwide sublicenseable license under certain patent rights covering the use of the STING Activator molecules that activate the STING receptor to make, develop, use and commercialize products, to practice methods and to offer services, in each case that are covered by the licensed patent rights, in all fields of use. Under this agreement, or the UCB Vance Agreement, we are obligated to use commercially reasonable efforts to develop, manufacture and sell licensed products and services and are obligated to achieve specified development and regulatory milestones by specified dates.

Under the UCB Vance Agreement, we paid UCB an upfront fee of $50,000 in 2014 and are required to make future milestone payments totaling up to $1.5 million, in the aggregate, upon our achievement of certain specified development and regulatory milestones for the first indication and up to $250,000 upon our achievement of a specified development and regulatory milestone for each additional indication developed. Under the UCB Vance Agreement, we are obligated to pay UCB royalties based on net sales of licensed products and services sold by us and our sublicensees at a rate in the low single-digit percentages, subject to minimum annual royalties and customary reductions, and a percentage of consideration received from any sublicensing arrangements at rates ranging from the low-single digits to the low thirties, determined by the current stage of development of the relevant licensed product at the time the sublicense is granted.

The UCB Vance Agreement will continue in effect until the expiration of the last-to-expire valid claim within the licensed patent rights. UCB may terminate the agreement upon 90 days' advance written notice in the event of our material breach that is not cured within such 90-day period. We may terminate the agreement at will upon 90 days' advance written notice. UCB may terminate the agreement upon 90 days' advance written notice in the event we challenge the validity or unenforceability of any licensed patent.

Memorial Sloan Kettering Cancer Center Agreement

In December 2014, we entered into a license agreement with Memorial Sloan Kettering Cancer Center, or MSK, The Rockefeller University, Rutgers, The State University of New Jersey, and University of Bonn, collectively the Licensors, pursuant to which we received an exclusive, worldwide, sublicensable license under certain patents related to STING Activators and a non-exclusive, worldwide, sublicensable license under specified know-how, in each case to develop, make, have made, use, have used, import, sell, and otherwise commercialize licensed products for use in therapeutic and/or prophylactic treatments in humans. Under the agreement, or the MSK Agreement, we are obligated to use commercially reasonable efforts to develop and commercialize a licensed product, including achieving specified development and regulatory milestones by specified dates. In May and October 2016, the parties amended the license to further expand its scope, which now covers all products covered by the licensed intellectual property.

Under the MSK Agreement, we paid MSK upfront fees of $50,000 in 2015 and an additional $2.0 million in 2016 in connection with the second amendment of the MSK Agreement. Under the amended MSK Agreement we are required to pay MSK development and regulatory milestone payments totaling up to $875,000 for each licensed product and commercialization milestone payments totaling up to $4.5 million for each licensed product. We are also required to pay MSK royalties based on net sales of licensed products by us and our sublicensees at a rate ranging in the low single digits depending on whether the licensed product is covered by a valid claim of the licensed patents, subject to minimum annual royalties. Our royalty obligation to MSK continues on a country-by-country basis until the later of the expiration of the last patent right covering the licensed product in such country or 10 years from the first commercial sale in such country. We are also obligated to pay MSK a percentage of certain consideration received for the grant of sublicenses, ranging from ten to the mid-twenties.

The MSK Agreement will continue in effect until the expiration of our royalty obligations. Either party may terminate the MSK Agreement upon the other party's uncured material breach that is not cured within 90 days after the breaching party receives notice of such breach. Additionally, the Licensors may terminate the MSK Agreement for our bankruptcy or insolvency or if we fail to pay any undisputed amounts owed under the agreement and do not cure such failure within 30 days after receiving notice of such failure.

Competition

The biotechnology and pharmaceutical industries, and the immunotherapy subsector, are characterized by rapid evolution of technologies, fierce competition and strong defense of intellectual property. A wide variety of institutions, including large pharmaceutical companies, specialty biotechnology companies, academic research departments and public and private research institutions, are actively developing potentially competitive products and technologies. We face substantial competition from biotechnology and pharmaceutical companies developing immunotherapy products.

Our competitors in the field of diversified immunotherapy include: AstraZeneca PLC, Amgen Inc., Bristol-Myers Squibb Company, Celgene Corporation, Eli Lilly and Company, GlaxoSmithKline plc, Incyte Corporation, Janssen Pharmaceuticals, Merck & Co., Novartis AG, Pfizer Inc., Roche Holding AG and Sanofi SA. Our competitors in STING pathway technology include Merck & Co., Inc., Synlogic, Inc. and Spring Bank Pharmaceuticals; for anti-APRIL includes Otsuka Pharmaceutical Co.,Ltd. (Visterra, Inc.); and for the cGAS-STING pathway inhibitor program includes IFM Due, a subsidiary of IFM Therapeutics, LLC. While we believe that our product candidates, technology, knowledge and experience provide us with competitive advantages, we face competition from established and emerging pharmaceutical and biotechnology companies, among others. Any product candidates that we successfully develop and commercialize will compete with existing and new therapies that may become available in the future. The availability of reimbursement from government and other third-party payors will also significantly affect the pricing and competitiveness of our products.

Many of our competitors, either alone or with strategic partners, have substantially greater financial, technical and human resources than we do. Accordingly, our competitors may be more successful than us in obtaining approval for treatments and achieving widespread market acceptance, rendering our treatments obsolete or non-competitive. Accelerated mergers and acquisitions activity in the biotechnology and pharmaceutical industries may result in even more resources being concentrated among a smaller number of our competitors. These companies also compete with us in recruiting and retaining qualified scientific and management personnel, establishing clinical study sites and patient registration for clinical studies and 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.

Our commercial opportunity could be substantially limited in the event that our competitors develop and commercialize products that are more effective, safer, less toxic, more convenient or cheaper than our comparable products. In geographies that are critical to our commercial success, competitors may also obtain regulatory approvals before us, resulting in our competitors building a strong market position in advance of our product's entry. We believe the factors determining the success of our programs will be the efficacy, safety and convenience of our product candidates.

Government Regulation and Product Approval

As a biopharmaceutical company that operates in the United States and the Netherlands, we are subject to extensive regulation. Federal, state and local government authorities in the United States 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 biological and pharmaceutical products such as those we are developing. Our product candidates must be approved by the FDA before they may be legally marketed in the United States 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 United States, 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. The process for obtaining regulatory marketing approvals and the subsequent compliance with appropriate federal, state, local and foreign statutes and regulations require the expenditure of substantial time and financial resources.

U.S. Product Development Process

In the United States, the FDA regulates pharmaceutical and biological products under the Federal Food, Drug, and Cosmetic Act, or FDCA, and the Public Health Service Act, or PHSA, and the FDA's implementing regulations. Products are also subject to other federal, state and local statutes and regulations. The process of obtaining regulatory approvals and the subsequent compliance with appropriate federal, state, local and foreign statutes and regulations require the expenditure of substantial time and financial resources. Failure to comply with the applicable U.S. requirements at any time during the product development process, approval process or after approval, may subject an applicant to administrative or judicial sanctions. FDA sanctions could include, among other actions, refusal to approve pending applications, withdrawal of an approval, a clinical hold, warning letters, product recalls or withdrawals from the market, product seizures, total or partial suspension of production or distribution injunctions, fines, refusals of government contracts, restitution, disgorgement or civil or criminal penalties. Any agency or judicial enforcement action could have a material adverse effect on us. The FDA has limited experience with commercial development of combination immuno-oncology products. The process required by the FDA before a drug or biological product may be marketed in the United States generally involves the following:

- 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;
- submission to the FDA of an investigational new drug, or IND, application, which must become effective before human clinical trials may begin;

- 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 product candidate for its intended use;
- submission to the FDA of a biologics license application, or BLA, for any biologic or an NDA for any drug we seek to market that includes substantive evidence of safety, purity and potency, or safety and effectiveness from results of nonclinical testing and clinical trials;
- satisfactory completion of an FDA inspection of the manufacturing facility or facilities where the product is produced, to assess compliance with cGMP, to assure that the facilities, methods and controls are adequate to preserve the product's identity, strength, quality and purity, and, if applicable, the FDA's current good tissue practices, or GTPs, for the use of human cellular and tissue products;
- potential FDA audit of the nonclinical study and clinical trial sites that generated the data in support of the BLA or NDA; and
- FDA review and approval, or licensure, of the NDA or BLA.

Before testing any product candidate in humans, the product candidate enters the preclinical testing stage. Preclinical tests, also referred to as nonclinical studies, include laboratory evaluations of product chemistry, toxicity and formulation, as well as animal studies to assess the potential safety and activity of the product candidate. The conduct of the preclinical tests must comply with federal regulations and requirements including GLPs. 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 and the FDA must resolve any outstanding concerns before the clinical trial can begin. The FDA may also impose clinical holds on a 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 trials.

Clinical trials involve the administration of the 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 (except in the cases of Sponsor-Investigator studies). 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 composing the GCP requirements, including the requirement that all research patients provide informed consent. Further, each clinical trial must be reviewed and approved by an independent institutional review board, or IRB, at or servicing each institution at which the clinical trial will be conducted. An IRB is charged with protecting the welfare and rights of 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.

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

- Phase 1. The biological product is initially introduced into healthy human patients 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.
- 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.
- 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 gather additional information about a product's safety, efficacy or optimal use. Some of the studies may be required under statue or regulation; others may be trials a sponsor has committed to conduct.

During all phases of clinical development, regulatory agencies require extensive monitoring and auditing of all clinical activities, clinical data and clinical trial investigators. Quarterly safety reporting is required for marketed products for the first three years after approval. Annual progress reports detailing the results of the clinical trials (for INDs) and changes to the application (for marketed products) 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 that are considered related to study drug, 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 adverse reaction that is considered related to study drug 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 immuno-oncology 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 product candidate 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 criteria, 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.

U.S. Review and Approval Processes

After the completion of clinical trials of a product candidate, FDA approval of a BLA or NDA must be obtained before commercial marketing of the product. The BLA or NDA 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 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 or NDA 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 or NDA must be accompanied by a significant user fee. The FDA adjusts the PDUFA user fees on an annual basis. PDUFA also imposes an annual program fee for marketed 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 or NDAs for products designated as orphan drugs, unless the product also includes a non-orphan indication.

Within 60 days following submission of the application, the FDA reviews a BLA or NDA submitted to determine if it is substantially complete before the agency accepts it for filing. The FDA may refuse to file any BLA or NDA that it deems incomplete or not properly reviewable at the time of submission, and may request additional information. In this event, the BLA or NDA may 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 or NDA. Under PDUFA, the FDA has agreed to certain performance goals to complete the review of BLAs. The FDA may give a priority review designation to biological products that offer significant improvements in safety or efficacy, or provide a treatment where no adequate therapy exists. A priority review means that the goal for the FDA to review an application is six months, rather than the standard review of ten months under current PDUFA guidelines. Under the current PDUFA agreement, these six- and ten-month review periods are measured from the "filing" date rather than the receipt date for original BLAs, which typically adds approximately two months to the timeline for review and decision from the date of submission.

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 in the case of an NDA, whether the product is safe and effective for its intended use, and in each case, whether the product is being manufactured in accordance with cGMP. The FDA may refer applications for novel biological or drug products or biological or drug 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 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 product. If the FDA concludes a REMS is needed, the sponsor of the BLA or NDA must submit a proposed REMS. The FDA will not approve a BLA or NDA without a REMS, if required.

Before approving a BLA or NDA, 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. Additionally, before approving a BLA or NDA, 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 assure cGMP, GTP and GCP compliance, 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 or NDA does not satisfy its regulatory criteria for approval and deny approval. If the agency decides not to approve the BLA or NDA in its present form, the FDA will issue a complete response letter that describes all of the specific deficiencies in the BLA or NDA 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 or NDA, 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 indications 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 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, 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).

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 United States, or more than 200,000 individuals in the United States and for which there is no reasonable expectation that the cost of developing and making available in the United States a drug or biologic for this type of disease or condition will be recovered from sales in the United States for that drug or biologic. Orphan drug designation must be requested before submitting a BLA. After the FDA grants orphan drug designation, the generic identity of the therapeutic agent and its potential orphan use are disclosed publicly by the FDA. The orphan drug designation does not convey any advantage in, or shorten the duration of, the regulatory review or approval process.

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 United States 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.

In the European Union, orphan drug designation entitles a party to financial incentives such as reduction of fees or fee waivers and 10 years of market exclusivity is granted following drug or biological product approval. This period may be reduced to 6 years if the orphan drug designation criteria are no longer met, including where it is shown that the product is sufficiently profitable not to justify maintenance of market exclusivity.

There can be no assurance that we will receive orphan drug designation for any indications or for any product candidates.

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 for the disease or condition. Fast Track designation applies to the combination of the product and the specific indication for which it is being studied. Unique to a Fast Track product, the FDA may consider for review sections of the BLA or NDA 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 or NDA, the FDA agrees to accept sections of the BLA or NDA and determines that the schedule is acceptable, and the sponsor pays any required user fees upon submission of the first section of the BLA or NDA.

Any product, 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 has the potential to provide safe and effective therapy where no satisfactory alternative therapy exists or a significant improvement in the treatment, diagnosis or prevention of a disease compared to marketed products. The FDA will attempt to direct additional resources to the evaluation of an application for a new 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 has an effect on a surrogate endpoint that is reasonably likely to predict clinical benefit, or on a clinical endpoint that can be measured earlier than irreversible morbidity or mortality, that is reasonably likely to predict an effect on irreversible morbidity or mortality or other clinical benefit, taking into account the severity, rarity, or prevalence of the condition and the availability or lack of alternative treatments. As a condition of approval, the FDA may require that a sponsor of a drug or biological product receiving accelerated approval perform adequate and well-controlled post-marketing clinical studies. 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. 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 is available for product candidates that are intended, alone or in combination with one or more other products, to treat serious or life-threatening diseases or conditions and for which preliminary clinical evidence indicates that the product may demonstrate substantial improvement over currently available therapy on one or more clinically significant endpoints, such as substantial treatment effects observed early in clinical development. The designation includes all of the Fast Track program features, as well as more intensive FDA interaction and guidance. The Breakthrough Therapy designation is a distinct status from both Fast Track designation 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, FDA will work closely with the sponsor to expedite the development and review of such product.

Post-Approval Requirements

Any products for which we receive FDA approvals are subject to continuing regulation by the FDA, including, among other things, record-keeping requirements, reporting of adverse experiences with the product, providing the FDA with updated safety and efficacy information, product sampling and distribution requirements, and complying with FDA promotion and advertising requirements, which include, among others, standards for direct-to-consumer advertising, restrictions on promoting products for uses or in patient populations that are not described in the product's approved uses, known as off-label use, limitations on industry-sponsored scientific and educational activities and requirements for promotional activities involving the internet. Although physicians may prescribe legally available products for off-label uses, if the physicians deem to be appropriate in their professional medical judgment, manufacturers may not market or promote such off-label uses.

In addition, quality control and manufacturing procedures must continue to conform to applicable manufacturing requirements after approval to ensure the long-term stability of the product. We rely, and expect to continue to rely, on third parties for the production of clinical and commercial quantities of our products in accordance with cGMP regulations. cGMP regulations require among other things, quality control and quality assurance as well as the corresponding maintenance of records and documentation and the obligation to investigate and correct any deviations from cGMP. Manufacturers and other entities involved in the manufacture and distribution of approved products are required to register their establishments with the FDA and certain state agencies, and are subject to periodic unannounced inspections by the FDA and certain state agencies for compliance with cGMP and other laws. Accordingly, manufacturers must continue to expend time, money, and effort in the area of production and quality control to maintain cGMP compliance. Discovery of problems with a product after approval may result in restrictions on a product, manufacturer, or holder of an approved BLA or NDA, including, among other things, recall or withdrawal of the product from the market. In addition, changes to the manufacturing process are strictly regulated, and depending on the significance of the change, may require prior FDA approval before being implemented.

Other types of changes to the approved product, such as adding new indications and claims, are also subject to further FDA review and approval.

The FDA also may require post-marketing testing, known as Phase 4 testing, and surveillance to monitor the effects of an approved product. Discovery of previously unknown problems with a product or the failure to comply with applicable FDA requirements can have negative consequences, including adverse publicity, judicial or administrative enforcement, warning letters from the FDA, mandated corrective advertising or communications with doctors, and civil or criminal penalties, among others. Newly discovered or developed safety or effectiveness data may require changes to a product's approved labeling, including the addition of new warnings and contraindications, and also may require the implementation of other risk management measures. Also, new government requirements, including those resulting from new legislation, may be established, or the FDA's policies may change, which could delay or prevent regulatory approval of our products under development.

U.S. Patent Term Restoration and Marketing Exclusivity

The Biologics Price Competition and Innovation Act, or BPCIA, amended the PHSA to authorize the FDA to approve similar versions of innovative biologics, commonly known as biosimilars. A competitor seeking approval of a biosimilar must file an application to establish its product as highly similar to an approved innovator biologic, among other requirements. The BPCIA, however, bars the FDA from approving biosimilar applications for 12 years after an innovator biological product receives initial marketing approval. Biosimilarity, which requires that there be no clinically meaningful differences between the biological product and the reference product in terms of safety, purity, and potency, can be shown through analytical studies, animal studies, and a clinical study or studies. Interchangeability requires that a product is biosimilar to the reference product and the product must demonstrate that it can be expected to produce the same clinical results as the reference product in any given patient and, for products that are administered multiple times to an individual, the biologic and the reference biologic may be alternated or switched after one has been previously administered without increasing safety risks or risks of diminished efficacy relative to exclusive use of the reference biologic. However, complexities associated with the larger, and often more complex, structures of biological products, as well as the processes by which such products are manufactured, pose significant hurdles to implementation of the abbreviated approval pathway that are still being worked out by the FDA.

Under the BPCIA, an application for a biosimilar product may not be submitted to the FDA until four years following the date that the reference product was first licensed by the FDA. In addition, the approval of a biosimilar product may not be made effective by the FDA until 12 years from the date on which the reference product was first licensed. During this 12-year period of exclusivity, another company may still market a competing version of the reference product if the FDA approves a full BLA for the competing product containing the sponsor's own preclinical data and data from adequate and well-controlled clinical trials to demonstrate the safety, purity and potency of their product. This 12-year period of data exclusivity may be extended by six months, for a total of 12.5 years, if the FDA requests that the innovator company conduct certain pediatric clinical investigations of the product.

Depending upon the timing, duration and specifics of the FDA approval of the use of our product candidates, some of our U.S. patents, if granted, may be eligible for limited patent term extension under the Drug Price Competition and Patent Term Restoration Act of 1984, commonly referred to as the Hatch-Waxman Act. The Hatch-Waxman Act permits a patent restoration term of up to five years, as compensation for patent term lost during product development and the FDA regulatory review process. However, patent term restoration cannot extend the remaining term of a patent beyond a total of 14 years from the product's approval date. The patent term restoration period is generally one-half the time between the effective date of an IND and the submission date of a BLA or NDA plus the time between the submission date of a BLA or NDA and the approval of that application. Only one patent applicable to an approved product is eligible for the extension and the application for the extension must be submitted prior to the expiration of the patent. The U.S. Patent and Trademark Office, in consultation with the FDA, reviews and approves the application for any patent term extension or restoration. In the future, we may choose to apply for restoration of patent term for one of our currently owned or licensed patents to add patent life beyond its current expiration date, depending on the expected length of the clinical trials and other factors involved in the filing of the relevant BLA or NDA.

Pediatric exclusivity is another type of regulatory market exclusivity in the United States. Pediatric exclusivity, if granted, adds six months to existing exclusivity periods and patent terms. This six-month exclusivity, which runs from the end of other exclusivity protection or patent terms, may be granted based on the voluntary completion of a pediatric trial in accordance with an FDA-issued "Written Request" for such a trial.

Other U.S. Healthcare Laws and Compliance Requirements

In the United States, 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, for instance 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 physician payment transparency laws, the privacy and security provisions of the Health Insurance Portability and Accountability Act, or HIPAA, as amended by the Health Information Technology and Clinical Health Act, or HITECH, 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 purchasing, leasing, ordering or arranging for the purchase, lease or order of any item or service reimbursable under Medicare, Medicaid or other federal healthcare programs. The term remuneration has been interpreted broadly to include anything of value. The Anti-Kickback Statute has been interpreted to apply to arrangements between pharmaceutical manufacturers on 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. Our practices may not in all cases meet all of the criteria for protection under a statutory exception or regulatory safe harbor. Failure to meet all of the requirements of a particular applicable statutory exception or regulatory safe harbor, however, 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. 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 False Claims Act, as discussed below.

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

HIPAA created new federal criminal statutes that prohibit knowingly and willfully executing, or attempting to execute, a scheme to defraud or to obtain, by means of false or fraudulent pretenses, representations or promises, any money or property owned by, or under the control or custody of, any healthcare benefit program, including private third-party payors and knowingly and willfully falsifying, concealing or covering up by trick, scheme or device, a material fact or making any materially false, fictitious or fraudulent statement in connection with the delivery of or payment for healthcare benefits, items or services. Similar to the Anti-Kickback Statute, a person or entity does not need to have actual knowledge of the statute or specific intent to violate it in order to have committed a violation.

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 HITECH Act, and their respective implementing regulations, impose requirements relating to the privacy, security and transmission of individually identifiable health information. Among other things, HITECH makes HIPAA's privacy and security standards directly applicable to business associates, independent contractors or agents of covered entities that receive or obtain protected health information in connection with providing a service on behalf of a covered entity. HITECH also created four new tiers of civil monetary penalties, amended HIPAA to make civil and criminal penalties directly applicable to business associates, and gave state attorneys general new authority to file civil actions for damages or injunctions in federal courts to enforce the federal HIPAA laws and seek attorneys' fees and costs associated with pursuing federal civil actions. In addition, state laws govern the privacy and security of health information in specified circumstances, many of which differ from each other in significant ways, 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 information related to certain payments or other transfers of value made or distributed to physicians and teaching hospitals, or to entities or individuals at the request of, or designated on behalf of, the physicians and teaching hospitals and to report annually certain ownership and investment interests held by physicians and their immediate family members and payments or other "transfers of value" made to such physician owners. Failure to submit timely, accurately, and completely the required information may result in civil monetary penalties. Manufacturers must submit reports by the 90th day of each calendar year. Certain states also mandate implementation of compliance programs, impose restrictions on pharmaceutical manufacturer marketing practices and/or require the tracking and reporting of gifts, compensation and other remuneration to healthcare providers and entities.

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. Some states also impose requirements on manufacturers and distributors to establish the pedigree of product in the chain of distribution, including some states that require manufacturers and others to adopt new technology capable of tracking and tracing product as it moves through the distribution chain. Several states have enacted legislation requiring pharmaceutical and biotechnology companies to 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 healthcare 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 federal and state healthcare laws described above or any other governmental regulations that apply to us, we may be subject to penalties, including without limitation, civil, criminal and/or administrative penalties, damages, fines, disgorgement, exclusion from participation in government programs, such as Medicare and Medicaid, injunctions, private "qui tam" actions brought by individual whistleblowers in the name of the government, or refusal to allow us to enter into government contracts, contractual damages, reputational harm, administrative burdens, diminished profits and future earnings and the curtailment or restructuring of our operations, any of which could adversely affect our ability to operate our business and our results of operations.

Coverage, 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 United States 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 that third-party payors provide coverage, and establish adequate reimbursement levels for such products. In the United States, third-party payors include federal and state healthcare 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 United States has increased and we expect will continue to increase the pressure on healthcare 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.

Healthcare Reform

In March 2010, President Obama enacted the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act of 2010, or collectively, the Affordable Care Act.

Among the Affordable Care Act's provisions of importance to the pharmaceutical and biotechnology industries are the following:

- an annual, nondeductible fee on any entity that manufactures or imports certain specified branded prescription drugs and biologic agents apportioned among these entities according to their market share in some government healthcare programs;
- an increase in the statutory minimum rebates a manufacturer must pay under the Medicaid Drug Rebate Program, to 23.1% and 13% of the average manufacturer price for most branded and generic drugs, respectively, and a cap on the total rebate amount for innovator drugs at 100% of the Average Manufacturer Price, or AMP;
- addressed a new methodology by which rebates owed by manufacturers under the Medicaid Drug Rebate Program are calculated for certain drugs and biologics, including our product candidates, that are inhaled, infused, instilled, implanted or injected;
- extension of manufacturers' Medicaid rebate liability to covered drugs dispensed to individuals who are enrolled in Medicaid managed care organizations;
- expansion of eligibility criteria for Medicaid programs by, among other things, allowing states to offer Medicaid coverage to additional individuals and by adding new mandatory eligibility categories for individuals with income at or below 133% of the federal poverty level, thereby potentially increasing manufacturers' Medicaid rebate liability;
- a new Medicare Part D coverage gap discount program, in which manufacturers must agree to offer point-of-sale discounts off negotiated prices of applicable brand drugs to eligible beneficiaries during their coverage gap period, as a condition for the manufacturer's outpatient drugs to be covered under Medicare Part D;

- expansion of the entities eligible for discounts under the Public Health Service pharmaceutical pricing program; and
- a new Patient-Centered Outcomes Research Institute to oversee, identify priorities in, and conduct comparative clinical effectiveness research, along with funding for such research.

Some of the provisions of the Affordable Care Act have yet to be implemented, and there have been judicial and Congressional challenges to certain aspects of the Affordable Care Act, as well as recent efforts by the Trump administration to repeal or replace certain aspects of the Affordable Care Act. The Tax Cuts and Jobs Act of 2017 includes a provision repealing, effective January 1, 2019, the tax-based shared responsibility payment imposed by the Affordable Care Act on certain individuals who fail to maintain qualifying health coverage for all or part of a year that is commonly referred to as the "individual mandate". On December 14, 2018, a U.S. District Court Judge in the Northern District of Texas, ruled that the individual mandate is a critical and inseverable feature of the Affordable Care Act, and therefore, because it was repealed as part of the Tax Act, the remaining provisions of the Affordable Care Act are invalid as well. While the Trump Administration and CMS have both stated that the ruling will have no immediate effect, it is unclear how this decision, subsequent appeals, if any, and other efforts to repeal and replace the Affordable Care Act will impact the Affordable Care Act and our business. Congress also could consider additional legislation to repeal or replace other elements of the Affordable Care Act. Thus, the full impact of the Affordable Care Act (or other similar legislation) on our business remains unclear.

Other legislative changes have been proposed and adopted in the United States since the Affordable Care Act was enacted. For example, the Budget Control Act of 2011 resulted in aggregate reductions of Medicare payments to providers of 2% per fiscal year, which went into effect in April 2013, and will remain in effect through 2027 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, including hospitals and cancer treatment centers, and increased the statute of limitations period for the government to recover overpayments to providers from three to five years. Additionally, there has been increasing legislative and enforcement interest in the United States with respect to specialty drug pricing practices. Specifically there have been several recent U.S. Congressional inquiries and proposed and enacted federal legislation designed to, among other things, bring more transparency to drug pricing, review the relationship between pricing and manufacturer patient programs, reduce the cost of drugs under Medicare, and reform government program reimbursement methodologies for drugs. Further, Congress and the Trump administration have each indicated that it will continue to seek new legislative and/or administrative measures to control drug costs. 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, to encourage importation from other countries and bulk purchasing. We anticipate that the Affordable Care Act and other legislative reforms will result in additional downward pressure on the price that we receive for any approved product, if covered, and could seriously harm our business, though we are still unsure what its full impact will be. Adoption of price controls and cost-containment measures, and adoption of more restrictive policies in jurisdictions with existing controls and measures, could further limit our future revenue potential and results.

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 United States 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, even though we do not and will not control referrals of healthcare services or bill directly to Medicare, Medicaid or other third-party payors, federal and state healthcare laws and regulations pertaining to fraud and abuse and patients' rights are and will be applicable to our business. 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, also 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.

Europe and Rest of World Government Regulation

In addition to regulations in the United States, we will be subject to a variety of regulations in other jurisdictions governing, among other things, clinical trials and any commercial sales and distribution of our products. Whether or not we obtain FDA approval of a product, we must obtain the requisite approvals from regulatory authorities in foreign countries prior to the commencement of clinical trials or marketing of the product in those countries. Certain countries outside of the United States have a similar process that requires the submission of a clinical trial application much like the IND prior to the commencement of human clinical trials. In the EU, for example, a clinical trial application must be submitted to each country's national health authority and an independent ethics committee, much like the FDA and IRB, respectively. Once the clinical trial application is approved in accordance with a country's requirements, clinical trial development may proceed. Because biologically sourced raw materials are subject to unique contamination risks, their use may be restricted in some countries.

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

To obtain regulatory approval of an investigational drug or biological product under EU regulatory systems, we must submit a marketing authorization application. The application used to file the BLA in the United States is similar to that required in the EU, with the exception of, among other things, country-specific document requirements.

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

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

Employees

As of December 31, 2018, we had 152 full-time employees, 115 of whom were engaged in research and development activities and 37 of whom were engaged in finance, business development, facilities, human resources and administrative support. Of our full-time employees, 39 hold Ph.D. or M.D. degrees. None of our employees are subject to a collective bargaining agreement. We consider our relationship with our employees to be good.

Corporate Information

We were incorporated in California as Oncologic, Inc. in 2000. In 2008, we merged with Triton BioSystems, Inc. and subsequently changed our name to Aduro Biotech, Inc. in 2009. In June 2011, we reincorporated as a Delaware corporation. Our principal executive offices are located at 740 Heinz Avenue, Berkeley, California 94710 and our telephone number is (510) 848-4400. Our website address is www.aduro.com. Information contained on or accessible through our website is not a part of this Annual Report on Form 10-K. The following filings are available through our website as soon as reasonably practicable after we file them with the SEC: Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K, as well as any amendments to such reports and all other filings pursuant to Section 13(a) or 15 (d) of the Securities Act.

Aduro, Aduro Biotech, the Aduro logo and other trade names, trademarks or service marks of Aduro appearing in this Annual Report on Form 10-K are the property of Aduro. Trade names, trademarks and service marks of other companies appearing in this report are the property of their respective holders.

Item 1A. Risk Factors.

RISK FACTORS

Investing in our common stock involves a high degree of risk. You should carefully consider the following risks and all of the other information contained in this Annual Report on Form 10-K, including our consolidated financial statements and related notes and the section "Management's Discussion and Analysis of Financial Condition and Results of Operations," before investing in our common stock. While we believe that the risks and uncertainties described below are the material risks currently facing us, additional risks that we do not yet know of or that we currently think are immaterial may also arise and materially affect our business. If any of the following risks materialize, our business, financial condition and results of operations could be materially and adversely affected. In that case, the trading price of our common stock could decline, and you may lose some or all of your investment.

Risks Related to Our Business

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

We are an immunotherapy company with a limited operating history. Investment in biopharmaceutical product development is highly speculative because it entails substantial upfront capital expenditures and significant risk that any potential product candidate will fail to demonstrate efficacy or an acceptable safety profile, gain regulatory approval and become commercially viable. We have financed our operations primarily through the sale of common stock, and licensing agreements with pharmaceutical partners. Since our inception, most of our resources have been dedicated to the preclinical and clinical development of our product candidates. The size of our future net losses will depend, in part, on our future expenses and our ability to generate revenue. We have no products approved for commercial sale and have not generated any revenue from product sales to date, and we continue to incur significant research and development and other expenses related to our ongoing operations. We incurred a net loss of $95.4 million, $91.9 million and $91.1 million for the years ended December 31, 2018, 2017 and 2016, respectively. At December 31, 2018, we had an accumulated deficit of $404.5 million. We expect to continue to incur significant losses for the foreseeable future, and we expect these losses to increase as we continue our research and development of, and seek regulatory approvals for, our product candidates.

Even if we succeed in commercializing one or more of our product candidates, we will continue to incur substantial research and development and other expenditures to develop and market additional product candidates. 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 substantial additional financing to achieve our goals, and a failure to obtain this necessary capital when needed could force us to delay, limit, reduce or terminate our product development or commercialization efforts.

Our operations have consumed substantial amounts of cash since inception. At December 31, 2018, our cash and cash equivalents and marketable securities were $277.9 million. We expect to continue to spend substantial amounts to continue the development of our product candidates. If we are able to gain regulatory approval for any of our product candidates, we will require significant additional amounts of cash in order to launch and commercialize any such product candidates. In addition, other unanticipated costs may arise. Because the design and outcome of our planned and anticipated clinical trials are highly uncertain, we cannot reasonably estimate the actual amounts necessary to successfully complete the development and commercialization of our product candidates.

Our future capital requirements depend on many factors, including:

- the scope, progress, results and costs of researching and developing our product candidates, and conducting preclinical studies and clinical trials;
- the timing of, and costs associated with, obtaining regulatory approvals for our product candidates if clinical trials are successful;
- the cost of commercialization activities for our product candidates, if any of our product candidates is approved for sale, including marketing, sales and distribution costs;
- the cost of manufacturing our product candidates for clinical trials in preparation for regulatory approval and in preparation for commercialization and product launch;
- our ability to establish and maintain strategic licensing or other arrangements and the financial terms of such agreements;

- the costs involved in preparing, filing, prosecuting, maintaining, expanding, defending and enforcing patent claims, including litigation costs and the outcome of such litigation;
- the timing, receipt and amount of sales of, or royalties on, our future products, if any;
- competing cancer therapies and combinations; and
- other market developments.

We do not have any committed external source of funds or other support for our development efforts other than our license agreements, including our collaboration and license agreement with Novartis, which may be terminated by Novartis upon 180 days' notice, and our license agreement with Merck, which may be terminated by Merck upon 120 days' notice, and our collaboration and license agreement with Lilly, which may be terminated following a specified notice period. Until we can generate sufficient product and royalty revenue to finance our cash requirements, which we may never do, we expect to finance our future cash needs through a combination of public or private equity offerings, debt financings, collaborations, strategic alliances, licensing arrangements and other marketing or distribution arrangements. Additional financing may not be available to us when we need it or it may not be available on favorable terms.

If we raise additional capital through marketing and distribution arrangements or other collaborations, strategic alliances or licensing arrangements with third parties, we may have to relinquish certain valuable rights to our product candidates, technologies, future revenue streams or research programs or grant licenses on terms that may not be favorable to us. If we raise additional capital through public or private equity offerings, including our "at-the-market" offering, the ownership interest of our existing stockholders will be diluted, and the terms of these securities may include liquidation or other preferences that adversely affect our stockholders' rights. If we raise additional capital through debt financing, we may be subject to covenants limiting or restricting our ability to take specific actions, such as incurring additional debt, making capital expenditures or declaring dividends. If we are unable to obtain adequate financing when needed, we may have to delay, reduce the scope of or suspend one or more of our clinical trials or research and development programs or our commercialization efforts.

Our corporate strategy and reset may not be successful.

On January 29, 2019, we announced a strategic reset to focus on Aduro's core strengths – discovery and development of novel product candidates in the Stimulator of Interferon Genes (STING) and A Proliferation Inducing Ligand (APRIL) pathways. The success of this strategic reset will depend on our ability to successfully redirect resources to development of STING and APRIL product candidates, retain senior management and other highly qualified personnel and generate multiple clinical data readouts over the next several years. Also on January 29, 2019, as a result of our strategic reset, we announced that we reduced our current workforce by approximately 37%. Our workforce after these actions may not be sufficient to fully execute our strategy, and we may not be able to effectively attract or retain senior management or other qualified employees needed to implement this strategy. If we are unable to successfully execute our strategy, our business, financial condition and results of operations may be materially and adversely affected.

Risks Related to the Development and Commercialization of Our Current and Future Product Candidates

Our product candidates are based on novel technologies, and the development and regulatory approval pathway for such product candidates is unproven and may never lead to marketable products.

We do not have any products that have gained regulatory approval. Our immuno-oncology product candidates are designed to leverage the patient's immune system to slow the growth and spread of, or eliminate, tumor cells. Any products we develop may not effectively modulate the immune response to slow the spread of or eliminate cancer cells. The scientific evidence to support the feasibility of immuno-oncology product candidates is preliminary and limited. Our business and future success depend on our ability to obtain regulatory approval of and then successfully commercialize our product candidates. Advancing these novel therapies creates significant challenges for us, including, among others:

- obtaining approval from regulatory authorities to conduct clinical trials with our product candidates;
- successful completion of preclinical studies and successful enrollment of clinical trials;
- successful completion of our clinical trials, including a favorable risk-benefit outcome;
- receipt of marketing approvals from the U.S. Food and Drug Administration, or FDA, and similar regulatory authorities outside the United States;
- obtaining and maintaining patent and trade secret protection and regulatory exclusivity for our product candidates;

- establishing commercial manufacturing, supply and distribution arrangements;
- establishing a commercial infrastructure;
- acceptance of our products by patients, the medical community and third-party payors;
- establishing market share while competing with other therapies;
- successfully executing our pricing and reimbursement strategy;
- a continued acceptable safety and adverse event profile of our products following regulatory approval; and
- qualifying for, identifying, registering, maintaining, enforcing and defending intellectual property rights and claims covering our products.

All of our product candidates will require additional clinical and non-clinical development, regulatory review and approval in multiple jurisdictions, substantial investment, access to sufficient commercial manufacturing capacity and significant marketing efforts before we can generate any revenue from product sales. We are not permitted to market or promote any of our product candidates before we receive regulatory approval from the FDA or comparable foreign regulatory authorities, and we may never receive regulatory approval for any of our product candidates. If we are unable to develop or receive marketing approval for our product candidates in a timely manner or at all, our business, financial condition and results of operations may be materially and adversely affected.

We may not be successful in our efforts to use and expand our technologies to build a pipeline of product candidates.

A key element of our strategy is to use and expand our technologies to build a pipeline of product candidates, combine our product candidates with existing and novel therapies, and progress these product candidates and combinations through clinical development for the treatment of various diseases. Although our research and development efforts to date have resulted in a pipeline of product candidates directed at various cancers, we may not be able to develop product candidates that are safe and effective. 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 as a result of being shown to have harmful side effects 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 continue to successfully develop and begin to commercialize product candidates, we will face difficulty in obtaining product revenues in future periods. See also the risk factor titled, "Our corporate strategy and reset may not be successful."

Clinical development involves a lengthy and expensive process with uncertain outcomes, and results of earlier studies and trials may not be predictive of future clinical trial results. Our clinical trials may fail to demonstrate adequately the safety and efficacy of one or more of our product candidates, which would prevent or delay regulatory approval and commercialization.

Before obtaining regulatory approvals for the commercial sale of our product candidates, we must demonstrate through lengthy, complex and expensive preclinical testing and clinical trials that our product candidates are both safe and effective for use in each target indication. Clinical testing is expensive and can take many years to complete, and its outcome is inherently uncertain. Failure can occur at any time during the clinical trial process.

Additionally, because our product candidates are based on new technologies and costs to treat patients with relapsed/refractory cancer and to treat potential side effects that may result from our product candidates may be significant, our clinical trial costs are likely to be significantly higher than for more conventional therapeutic technologies or drug products. The results of preclinical studies and early clinical trials of our product candidates may not be predictive of the results of later-stage clinical trials. There is typically an extremely high rate of attrition from the failure of product candidates proceeding through clinical trials. Product candidates in later stages of clinical trials may fail to show the desired safety and efficacy profile despite having progressed through preclinical studies and initial clinical trials. A number of companies in the biopharmaceutical industry have suffered significant setbacks in advanced clinical trials due to lack of efficacy or adverse safety profiles, notwithstanding promising results in earlier trials. We cannot be certain that we will not face similar setbacks. Most product candidates that commence clinical trials are never approved as commercial products.

Any delay, suspension, termination or request to repeat or redesign a trial could increase our costs and prevent or significantly delay our ability to commercialize our product candidates.

We may experience delays in our ongoing clinical trials, and we do not know whether planned clinical trials will begin on time, need to be redesigned, enroll patients on time or be completed on schedule, if at all. The commencement or completion of clinical trials can be delayed or aborted for a variety of reasons, including delays or failures related to:

- generating sufficient preclinical, toxicology or other in vivo or in vitro data to support the initiation of human clinical studies;
- obtaining regulatory approval to commence a trial;
- identifying and recruiting suitable clinical investigators;
- reaching agreement on acceptable terms with prospective contract research organizations, or CROs, and clinical trial sites, the terms of which can be subject to extensive negotiation and may vary significantly among different CROs and trial sites;
- obtaining institutional review board/ethics committee, or IRB/EC, approval at each site;
- recruiting suitable patients to participate in a trial;
- achieving an acceptable distribution of such patients based on treating institution and geography;
- patients not completing a trial or not completing post-treatment follow-up;
- clinical sites deviating from trial protocol, instructions or dropping out of a trial;
- regulatory agency-imposed clinical holds;
- adding new clinical trial sites; or
- manufacturing sufficient quantities of product candidate for use in clinical trials.

We could encounter delays if a clinical trial is suspended or terminated by us, by the IRBs/ECs of the institutions in which such trials are being conducted, by the Data Safety Monitoring Board, or DSMB, for such trial or by the FDA or other regulatory authorities. Such authorities may impose a clinical hold or suspend or terminate a clinical trial due to a number of factors, including failure to conduct the clinical trial in accordance with regulatory requirements or our clinical protocols, a negative finding from an inspection of the clinical trial operations or trial site by the FDA or other regulatory authorities, unforeseen safety issues or adverse side effects, failure to demonstrate a benefit from using a drug, changes in governmental regulations or administrative actions, lack of adequate funding to continue the clinical trial, or safety concerns raised by other clinical trials of therapies with similar mechanisms of action.

If we experience delays in the completion, or termination, of any clinical trial for our product candidates, the commercial prospects of that product candidate will be harmed, and our ability to generate product revenues from the product candidate will be delayed. In addition, any delays in completing our clinical trials will increase our costs, slow down our product candidate development and approval process and jeopardize our ability to commence product sales and generate revenues.

Actual or potential conflicts of interest arising from our relationships with investigators could adversely impact the FDA approval process.

Principal investigators for our clinical trials may serve as scientific advisors or consultants to us from time to time and receive cash compensation in connection with such services. We also provide grants to investigators' institutions from time to time. If certain of these relationships exceed specific financial thresholds, they must be reported to the FDA. If these relationships and any related compensation paid results in perceived or actual conflicts of interest, or the FDA concludes that the financial relationship may have affected interpretation of the study, the integrity of the data generated at the applicable clinical trial site may be questioned and the utility of the clinical trial itself may be jeopardized, which could result in the delay in approval, or rejection, of our marketing applications by the FDA.

Our product candidates may cause undesirable side effects or may have other properties that could halt their clinical development, prevent their regulatory approval, limit their commercial potential, if approved, or result in significant negative consequences.

Side effects or adverse events associated with the use of our product candidates may be observed at any time, including in clinical trials or when a product is commercialized, and any such side effects or adverse events could cause us or regulatory authorities to interrupt, delay or halt clinical trials, result in a more restrictive label or the delay or denial of regulatory approval by the FDA or comparable foreign regulatory authorities, or negatively affect our ability to market our product candidates. Results of our clinical trials could reveal a high and unacceptable severity and prevalence of side effects or unexpected characteristics.

To date, patients treated with our product candidates have experienced drug-related side effects or adverse events, or AEs, including AEs that were considered moderate or severe. Examples of the AEs experienced include among others, fevers, injection sight pain, headaches, increased lipase and elevated amylase, tumor pain, dyspnea and respiratory failure. We cannot provide assurances that there will not be further adverse events.

If unacceptable side effects arise in the development of our product candidates, we could suspend or terminate our clinical trials or the FDA or comparable foreign regulatory authorities could order us to cease clinical trials, require us to conduct additional animal or human studies or deny approval of our product candidates for any or all targeted indications. Treatment-related side effects could also affect patient recruitment or the ability of enrolled patients to complete the trial or result in potential product liability claims. In addition, if side effects are observed in competing product candidates that are perceived to have similarities to ours, regulators or patients may infer that our product candidates could cause similar side effects. Any of these occurrences may materially and adversely affect our business, financial condition and results of operations.

Additionally, if one or more of our product candidates receives marketing approval, and we or others later identify undesirable side effects caused by such products, a number of potentially significant negative consequences could result, including:

- regulatory authorities may withdraw approvals of such product;
- regulatory authorities may require additional warnings on the label;
- the FDA could require a Risk and Evaluation Medication Strategy, or REMS, which could require the creation and management of a medication guide, communication plan or other elements to ensure safe use;
- we may be required to create a medication guide outlining the risks of such side effects for distribution to patients;
- we could be sued and held liable for harm caused to patients; and
- our reputation may suffer.

Any of these events could prevent us from achieving or maintaining market acceptance of the particular product candidate, if approved, and could materially and adversely affect our business, financial condition and results of operations.

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

The timely completion of clinical trials in accordance with their protocols depends on, among other things, our ability to enroll a sufficient number of patients who remain in the studies until their conclusion. We may experience difficulties in patient enrollment in our clinical trials for a variety of reasons. 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 trial;
- our ability to recruit clinical trial investigators with the appropriate competencies and experience;
- clinicians' and patients' perceptions as to the potential advantages of the product candidate being studied in relation to other available therapies, including any new drugs that may be approved for the indications we are investigating;
- our ability to obtain and maintain patient consents; and
- the risk that patients enrolled in clinical trials will drop out of the trials before completion.

In addition, our clinical trials will compete with other 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 trials may instead opt to enroll in a trial being conducted by one of our competitors. Because 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 such 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 hematopoietic cell transplantation, rather than enroll patients in any future clinical trial.

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 trials and adversely affect our ability to advance the development of our product candidates.

The market opportunities for our product candidates may be limited to those patients who are ineligible for established therapies or for whom prior therapies have failed, and may be small.

Cancer therapies are sometimes characterized as first line, second line or third line, and the FDA often approves new therapies initially only for third line use. When cancer is detected early enough, first-line therapy, usually chemotherapy, hormone therapy, surgery, radiotherapy or a combination of these is sometimes adequate to cure the cancer or prolong life without a cure. Second- and third-line therapies are administered to patients when prior therapy is not effective. We expect to initially seek approval of our product candidates as a therapy for patients who have received one or more prior treatments. Subsequently, for those products that prove to be sufficiently beneficial, if any, we would expect to seek approval potentially as a first-line therapy, but there is no guarantee that our product candidates, even if approved, would be approved for first-line therapy, and, prior to any such approvals, we may have to conduct additional clinical trials.

Our projections of both the number of people who have the cancers we are targeting, as well as the subset of people with these cancers who have received one or more prior treatments, and who have the potential to benefit from treatment with our product candidates, are based on our beliefs and estimates. These estimates have been derived from a variety of sources, including scientific literature, surveys of clinics, patient foundations or market research, and may prove to be incorrect. Further, new studies may change the estimated incidence or prevalence of these cancers. The number of patients may turn out to be lower than expected. Additionally, the potentially addressable patient population for our product candidates may be limited or may not be amenable to treatment with our product candidates. Even if we obtain significant market share for our product candidates, because the potential target populations are small, we may never achieve profitability without obtaining regulatory approval for additional indications, including to be used as a first- or second-line therapy.

We are subject to a multitude of manufacturing, supply chain, storage and distribution risks, any of which could substantially increase our costs and limit the supply of our product candidates.

The process of manufacturing our product candidates is complex, highly regulated and subject to several risks, including:

- The manufacturing of drug and biologic products is susceptible to product loss due to contamination, equipment failure, improper installation or operation of equipment or vendor or operator error. Even minor deviations from normal manufacturing processes could result in reduced production yields, product defects and other supply disruptions. If foreign microbial, viral or other contaminations are discovered in our product candidates or in the manufacturing facilities in which our product candidates are made, these manufacturing facilities may need to be closed for an extended period of time to investigate and remedy the contamination;
- The manufacturing facilities in which our product candidates are made could be adversely affected by equipment failures, labor shortages, natural disasters, power failures and numerous other factors;
- We and our contract manufacturers must comply with the FDA's current good manufacturing practices, or cGMP, regulations and guidelines. Any failure to follow cGMP or other regulatory requirements or any delay, interruption or other issues that arise in the manufacture, fill-finish, packaging or storage of our product candidates as a result of a failure of our facilities or the facilities or operations of third parties to comply with regulatory requirements or pass any regulatory authority inspection could significantly impair our ability to develop and commercialize our product candidates, including leading to significant delays in the availability of product candidates for our clinical studies, the termination or hold on a clinical study, or the delay or prevention of a filing or approval of marketing applications for our product candidates. Significant noncompliance could also result in the imposition of sanctions, including fines, injunctions, civil penalties, failure of regulatory authorities to grant marketing approvals for our product candidates, delays, suspension or withdrawal of approvals, license revocation, seizures or recalls of products, operating restrictions and criminal prosecutions, any of which could damage our reputation. If we are not able to maintain regulatory compliance, we may not be permitted to market our products and/or may be subject to product recalls, seizures, injunctions or criminal prosecution; and

- Our product candidates are sensitive to temperature, which must be controlled during storage and transportation, which adds complexity and expense. We rely on third parties to provide controlled temperature storage and shipping. If any third-party provider fails to maintain proper temperature control or if a shipment is delayed in transit for a prolonged period of time, the product candidate could become unsuitable for use.

Any adverse developments affecting manufacturing operations for our product candidates and/or damage that occurs during shipping may result in delays, inventory shortages, lot failures, withdrawals or recalls or other interruptions in the supply of our drug substance and drug product. We may also have to write off inventory, incur other charges and expenses for supply of drug product that fails to meet specifications, undertake costly remediation efforts or seek more costly manufacturing alternatives. Inability to meet the demand for any of our product candidates, if approved, could damage our reputation and the reputation of our products among physicians, healthcare payors, patients or the medical community, which could materially and adversely affect our business, financial condition and results of operations.

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

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

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

We cannot assure you that we will be able to develop in-house sales and distribution capabilities or establish or maintain relationships with third-party collaborators to commercialize any product in the United States or elsewhere.

A variety of risks associated with conducting clinical trials and marketing our product candidates internationally could materially and adversely affect our business, financial condition and results of operations.

We plan to seek regulatory approval of our product candidates outside of the United States and, accordingly, we expect that we will be subject to additional risks related to operating in foreign countries in conducting clinical trials and if we obtain the necessary approvals, including:

- differing legal and 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, including clinical trials;
- workforce uncertainty in countries where labor unrest is more common than in the United States;
- potential liability under the Foreign Corrupt Practices Act of 1977 or comparable foreign regulations;
- challenges to and protecting our contractual and intellectual property rights, including in those foreign countries that do not respect and protect intellectual property rights to the same extent as the United States;
- production shortages resulting from any events affecting raw material supply or manufacturing capabilities abroad; and
- business interruptions resulting from geo-political actions, including war and terrorism.

These and other risks associated with our international operations may materially and adversely affect our business, financial condition and results of operations.

We face significant competition from other biotechnology and pharmaceutical companies, and our business, financial condition and results of operations 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.

Many major multinational pharmaceutical companies, established biotechnology companies, specialty pharmaceutical companies and universities and other research institutions continue to invest time and resources in developing novel approaches to immuno-oncology. Promising results have spurred significant competition from major pharmaceutical and biotechnology companies alike. Our competitors in the field of diversified immunotherapy include: AstraZeneca PLC, Amgen Inc., Bristol-Myers Squibb Company, Celgene Corporation, Eli Lilly and Company, GlaxoSmithKline plc, Incyte Corporation, Janssen Pharmaceuticals, Merck & Co., Novartis AG, Pfizer Inc., Roche Holding AG and Sanofi SA. Our competitors in the STING pathway activator technology include Merck & Co., Inc., Synlogic, Inc. and Spring Bank Pharmaceuticals; for anti-APRIL includes Otsuka Pharmaceutical Co., Ltd. (following its acquisition of Visterra, Inc.); and for the cGAS-STING pathway inhibitor program includes IFM Due, a subsidiary of IFM Therapeutics, LLC. While we believe that our product candidates, technology, knowledge and experience provide us with competitive advantages, we face competition from established and emerging pharmaceutical and biotechnology companies, among others. Many of our competitors have substantially greater financial, technical and other resources than we do, such as larger research and development staff and experienced marketing, market access 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.

Even if we obtain regulatory approval of our product candidates, the availability and prices of our competitors' products could limit the demand and the prices 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.

We are highly dependent on our key personnel, and if we are not successful in attracting and retaining highly qualified personnel, we may not be able to successfully implement our business strategy.

Our ability to compete in the highly competitive biotechnology and pharmaceutical industries depends upon our ability to attract and retain highly qualified managerial, scientific and medical personnel. We are highly dependent on our management, scientific and medical personnel, including our President and Chief Executive Officer, our Chief Scientific Officer, our Chief Financial Officer and our Chief Administrative Officer. The loss of the services of any of our executive officers, other key employees and other scientific and medical advisors, and our inability to find suitable replacements, could result in delays in product development and harm our business. The Northern California region is headquarters to many other biopharmaceutical companies and many academic and research institutions. Competition for skilled personnel in our market is intense and may limit our ability to hire and retain highly qualified personnel on acceptable terms or at all.

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. For example, our Chief Medical Officer resigned from her position in 2018. We do not maintain "key person" insurance policies on the lives of these individuals or the lives of any of our other employees.

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

At December 31, 2018, we had 152 full-time employees, including 115 employees engaged in research and development, but we reduced our workforce by approximately 37% in connection with our strategic reset in January of 2019. As our development and commercialization plans and strategies develop, we expect to need additional managerial, operational, sales, marketing, financial and other personnel. Future growth would impose significant added responsibilities on members of management, including:

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

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

We currently rely, and for the foreseeable future will continue to rely, in substantial part on certain independent organizations, advisors and consultants to provide certain services, including substantially all aspects of regulatory approval, clinical management and manufacturing. We cannot assure you that the services of independent organizations, advisors and consultants will continue to be available to us on a timely basis or reasonable economic terms when needed, or at all. In addition, if we are unable to effectively manage our outsourced activities or if the quality or accuracy of the services provided by consultants is compromised for any reason, our clinical trials may be extended, delayed or terminated, and we may not be able to obtain regulatory approval of our product candidates or otherwise advance our business.

If we are not able to effectively expand our organization by hiring new employees and expanding our groups of consultants and contractors, we may not succeed in further developing and commercializing our product candidates and, accordingly, may not achieve our research, development and commercialization goals.

Our internal computer systems, or those used by our CROs or other contractors, consultants or vendors, may fail or suffer security breaches.

Despite the implementation of security measures, our internal computer systems and those of our CROs and other contractors, consultants or vendors are vulnerable to damage from computer viruses and unauthorized access. Any such material system failure or security breach 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. Likewise, we rely on third parties for the manufacture of our product candidates and to conduct clinical trials, and similar events relating to their computer systems could also have a material adverse effect on our business. 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.

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

Our operations, and those of our CROs and other contractors and consultants, could be subject to earthquakes, power shortages, telecommunications failures, water shortages, floods, hurricanes, typhoons, fires, extreme weather conditions, medical epidemics and other natural or man-made disasters or business interruptions, for which we are predominantly self-insured. The 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. Our corporate headquarters is in Northern California near major earthquake faults and fire zones. The ultimate impact on us, our significant suppliers and our general infrastructure of being located near major earthquake faults and fire zones and being consolidated in certain geographical areas is unknown, but our operations and financial condition could suffer in the event of a major earthquake, fire or other natural disaster.

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

The use of STING or APRIL product candidates as potential cancer treatments, even if approved, may not become broadly accepted by physicians, patients, hospitals, cancer treatment centers and others in the medical community. For example, certain of the product candidates that we are developing target a cell surface marker that may be present on non-cancerous cells as well as cancer cells. It is possible that our product candidates may kill these non-cancerous cells, which may result in unacceptable side effects, including death. Additional 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;
- side effects or results reported for competing products or product candidates that are perceived to have similarities to ours;
- product labeling or product insert requirements of the FDA or other regulatory authorities, including limitations or warnings;
- the timing of market introduction of our product candidates as well as competitive products;
- the cost of treatment in relation to alternative treatments;
- the availability of adequate coverage, reimbursement and pricing by third-party payors and government authorities;
- the willingness of patients to pay out-of-pocket in the absence of coverage by third-party payors and government authorities;
- adverse publicity or ethical or social controversies related to the use of our technologies or similar technologies;
- relative convenience and ease of administration, including as compared to alternative treatments and competitive therapies; and
- the effectiveness of our sales and marketing efforts.

If our product candidates are approved but fail to achieve or maintain market acceptance among physicians, patients, hospitals, cancer treatment centers or others in the medical community, we will not be able to generate significant revenue.

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. For example, 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. Claims could also be asserted under state consumer protection acts. If we cannot successfully defend ourselves against product liability claims, we may incur substantial liabilities or be required to limit commercialization of our product candidates. Even successful defense would require significant financial and management resources. Regardless of the merits or eventual outcome, liability claims may result in:

- decreased demand for our 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 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.
- We currently hold product liability insurance in amounts that we believe are customary for similarly situated companies and adequate to provide us with insurance coverage for foreseeable risks, but which may not be adequate to cover all liabilities that we may incur. Insurance coverage is increasingly expensive. We may not be able to maintain sufficient product liability insurance at an acceptable cost to protect against potential product liability claims, which could inhibit the commercialization of products we develop, alone or with collaborators. 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.

Risks Related to Our Reliance on Third Parties

We have entered into licensing agreements with third parties for certain product candidates and as a result have placed restrictions on our development of certain product candidates for particular indications. We may elect to enter into additional licensing or collaboration agreements to partner our product candidates in territories we currently retain. Our dependence on such relationships may adversely affect our business.

We have, and we may seek to enter into additional, collaboration agreements with other pharmaceutical or biotechnology companies. In the event we grant exclusive rights to such partners, we would be precluded from potential commercialization of our product candidates within the territories in which we have a partner. For example, we have entered into a collaboration and license agreement with Novartis for the development and commercialization of STING Activator product candidates in oncology. Under this agreement, we have granted Novartis a co-exclusive license to develop such products worldwide and an exclusive license to commercialize such products outside of the United States. We have also entered into a research collaboration and exclusive license agreement with Lilly for our cGAS-STING Pathway Inhibitor program for the research and development of novel immunotherapies for autoimmune and other inflammatory diseases and a worldwide development and commercialization agreement with Merck for the development of an anti-CD27 antibody. Any failure by our partners to perform their obligations or any decision by our partners to terminate these agreements could negatively impact our ability to successfully develop, obtain regulatory approvals for and commercialize our product candidates. For example, effective December 2018, Janssen terminated our exclusive research and license agreements under which we granted Janssen licenses for the development and commercialization of proprietary attenuated strains of *Listeria* for treatment of lung and prostate cancers. Any termination of our collaboration agreements, including the termination of our research and license agreements with Janssen, will terminate the funding we may receive under the relevant collaboration agreement and may impair our ability to fund further development efforts and our progress in our development programs.

Our commercialization strategy for our product candidates may depend on our ability to enter into agreements with collaborators to obtain assistance and funding for the development and potential commercialization of our product candidates in the territories in which we seek to partner. Despite our efforts, we may be unable to secure additional collaborative licensing or other arrangements that are necessary for us to further develop and commercialize our product candidates. Supporting diligence activities conducted by potential collaborators and negotiating the financial and other terms of a collaboration agreement are long and complex processes with uncertain results. Even if we are successful in entering into one or more collaboration agreements, collaborations may involve greater uncertainty for us, as we have less control over certain aspects of our collaborative programs than we do over our proprietary development and commercialization programs. For example, under our collaboration and license agreement with Novartis, we are responsible for a share of the worldwide joint development costs, which may be significant. If we elect to reduce our share of development funding as provided for under the agreement, our share in profits would decrease or convert to a royalty. We may determine that continuing a collaboration under the terms provided is not in our best interest, and we may terminate the collaboration. Our potential future collaborators could delay or terminate their agreements with us, and as a result our product candidates may never be successfully commercialized.

Further, our collaborators may develop alternative products or pursue alternative technologies either on their own or in collaboration with others, including our competitors, and the priorities or focus of our collaborators may shift such that our product candidates receive less attention or resources than we would like, or they may be terminated altogether. In addition, we could have disputes with our collaborators, including regarding development plans or the interpretation of terms in our agreements. Any such disagreements could lead to delays in the development or commercialization of our product candidates or could result in time-consuming and expensive litigation or arbitration, which may not be resolved in our favor.

We rely and will rely on third parties to conduct our clinical trials. If these third parties do not successfully carry out their contractual duties, meet expected deadlines, or otherwise conduct the trials as required or comply with regulatory requirements, we may not be able to obtain regulatory approval of or commercialize our product candidates when expected or at all.

We depend and plan to continue to depend upon independent investigators, other third parties and collaborators, such as universities, medical institutions, CROs and strategic partners, to conduct our preclinical and clinical trials under agreements with us. We have to negotiate budgets and contracts with CROs and study sites, which may result in delays to our development timelines and increased costs. We rely and plan to continue relying 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 the 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 trial sponsors, principal investigators and trial sites. If we or any of these third parties fail to comply with applicable GCP regulations, the clinical data generated in our clinical trials may be deemed unreliable and the FDA or comparable foreign regulatory authorities may require us to perform additional clinical trials before approving our marketing applications. We cannot assure you that, upon inspection, such regulatory authorities will determine that any of our clinical trials comply with the GCP regulations. In addition, our clinical trials must be conducted with product produced under cGMPs regulations. Our failure or any failure by these third parties to comply with these regulations 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 not our employees and, except for remedies available to us under our agreements with such third parties, we cannot control whether or not they devote sufficient time and resources to our 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 studies 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.

If our relationships with any third parties conducting our trials are terminated, we may be unable to enter into arrangements with alternative third parties on commercially reasonable terms, or at all. 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. Though we carefully manage our relationships with third parties conducting our clinical trials, we cannot assure you that we will not encounter similar challenges or delays in the future or that these delays or challenges will not have a material and adverse effect on our business, financial condition and results of operations.

We are subject to a multitude of manufacturing risks, any of which could substantially increase our costs, limit supply of our product candidates and interfere with obtaining product commercialization approvals.

We currently rely on outside vendors to manufacture clinical supplies of our product candidates and have limited experience manufacturing our product candidates. In order to develop our product candidates, apply for regulatory approvals and commercialize our products, if approved, we will need to develop, contract for, or otherwise arrange for the necessary manufacturing capabilities.

We may manufacture limited quantities of clinical trial materials ourselves in the future, but we currently rely on a limited number of contract manufacturing organizations, or CMOs, for our clinical product supplies. There are risks inherent in the manufacture of drug and biologic products that could affect the ability of our CMOs to meet our delivery time requirements or provide adequate amounts of material to meet our needs. Manufacturers of biologic products often encounter difficulties in production, particularly in scaling up and validating initial production. Typical manufacturing problems include low product yields, quality control failures, product instability, operator error, shortages of qualified personnel, storage mistakes and unpredictable production costs. If contaminants are discovered in our supply of our product candidates or in the manufacturing facilities, manufacturing facilities may need to be closed for an extended period of time to investigate and remedy the contamination, thereby interrupting supply.

If in the future we develop our own manufacturing capabilities by building our own manufacturing facilities, we will incur significant expenditures. In addition, the construction and qualification of a drug substance facility may take several years to complete and there are many risks inherent in the construction of a new facility that could result in delays and additional costs, including the need to obtain access to necessary equipment and third-party technology, if any. In addition, we would likely need to continue to hire and train qualified employees to staff our facilities.

The manufacturing process for any products that we may develop is subject to the FDA and foreign regulatory authority approval process and we will need to meet, and will need to contract with CMOs who can meet, all applicable FDA and foreign regulatory authority requirements on an ongoing basis. In addition, if we receive the necessary regulatory approval for any product candidate, we also expect to rely on third parties to produce materials required for commercial supply. If we are unable to obtain or maintain CMOs for these product candidates, or to do so on commercially reasonable terms, we may not be able to successfully develop and commercialize our products.

To the extent that we have existing, or enter into future, manufacturing arrangements with third parties, we depend, and will depend in the future, on these third parties to perform their obligations in a timely manner and consistent with contractual and regulatory requirements. The failure of any CMO to perform its obligations as expected, or, to the extent we manufacture all or a portion of our product candidates ourselves, our failure to execute on our manufacturing requirements, could materially and adversely affect our business, financial condition and results of operations.

If any CMO with whom we contract fails to perform its obligations, our ability to provide our product candidates to patients in clinical trials would be jeopardized. Any delay or interruption in the supply of clinical trial materials could delay the completion of clinical trials, increase the costs associated with maintaining clinical trial programs and, depending upon the period of delay, require us to commence new clinical trials at additional expense or terminate clinical trials completely.

We may not realize the benefits of acquisitions or strategic transactions, including our acquisition of Aduro Biotech Europe.

We acquired Aduro Biotech Europe in October 2015, and may acquire or license other businesses, products or technologies, as well as pursue strategic alliances, joint ventures or investments in complementary businesses. The success of acquisitions depends on a number of risks and uncertainties, including:

- unanticipated liabilities related to acquired companies;
- difficulties integrating acquired personnel, technologies and operations into our existing business;
- retention of key employees;
- diversion of management time and focus from operating our business to identification, negotiation or management of any strategic alliances or joint ventures or acquisition integration challenges;
- increases in expenses and reductions in our cash available for operations and other uses;
- disruption in our relationships with collaborators or suppliers as a result of such a transaction;
- stock issuances that dilute existing stockholders;
- competition for appropriate strategic alternatives;
- difficulty negotiating or executing any such arrangements; and
- possible write-offs or impairment charges relating to acquired businesses.

If any of these risks or uncertainties occur, we may not realize the anticipated benefit of any acquisition or strategic transaction. For example, our acquisition of Aduro Biotech Europe may not result in any product candidates that are safe and effective, or approved for sale. Additionally, foreign acquisitions, including our acquisition of Aduro Biotech Europe, are subject to additional risks, including those related to integration of operations across different cultures and languages, currency risks, potentially adverse tax consequences of overseas operations and the particular economic, political and regulatory risks associated with specific countries.

Risks Related to Government Regulation

The FDA regulatory approval process is lengthy, time-consuming and inherently unpredictable, and we may experience significant delays in the clinical development and regulatory approval of our product candidates or ultimately be unable to obtain regulatory approval for our product candidates, in which case our business will be substantially harmed.

We will not be permitted to market any of our product candidates in the United States until approval from the FDA is received. The time required to obtain approval by the FDA and comparable foreign authorities is unpredictable but typically takes many years following the commencement of clinical trials and depends upon numerous factors, including the substantial discretion of the regulatory authorities. In addition, approval policies, regulations or the type and amount of clinical data necessary to gain approval may change during the course of a product candidate's clinical development and may vary among jurisdictions. We have not previously submitted a biologics license application, or BLA, or a new drug application, or NDA, to the FDA, or similar marketing applications filings to comparable foreign authorities. A BLA or NDA must include extensive preclinical and clinical data and supporting information to establish the product candidate's safety, purity and potency, or safety and effectiveness for each desired indication. The BLA or NDA 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, the FDA has limited experience with commercial development of immunotherapies for cancer. We also intend to obtain regulatory approval of future product candidates regardless of cancer type or origin, which the FDA may have difficulty accepting if our clinical trials only involve cancers of certain origins. Accordingly, the regulatory approval pathway for our product candidates may be uncertain, complex, expensive and lengthy, and approval may not be obtained.

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

- the FDA or comparable foreign regulatory authorities may disagree with the design or implementation of our clinical trials;
- we may be unable to demonstrate to the satisfaction of the FDA or comparable foreign regulatory authorities that a product candidate is safe and effective for its proposed indication;
- the results of clinical trials may not meet the level of statistical significance required by the FDA or comparable foreign regulatory authorities for approval;
- we may be unable to demonstrate that a product candidate's clinical and other benefits outweigh its safety risks;
- the FDA or comparable foreign regulatory authorities may 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 support the submission of a BLA, NDA or other submission, or to obtain regulatory approval in the United States or elsewhere;
- the FDA or comparable foreign regulatory authorities may fail to approve the manufacturing processes or facilities of third-party manufacturers with which we contract for clinical and commercial supplies; or
- 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.

This lengthy approval process as well as the unpredictability of future clinical trial results may result in our failing to obtain regulatory approval to market our product candidates, which would significantly harm our business, results of operations and prospects.

In addition, even if we were to obtain approval, regulatory authorities may approve any of our product candidates for fewer or more limited indications than we request, may not approve the price we intend to charge for our products, may grant approval contingent on the performance of costly post-marketing clinical trials or may approve a product candidate with a label that does not include the labeling claims necessary or desirable for the successful commercialization of that product candidate. Any of the foregoing scenarios could materially harm the commercial prospects for 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. For example, even if the FDA grants marketing approval of a product candidate, comparable regulatory authorities in foreign jurisdictions must also approve the manufacturing, marketing and promotion of the product candidate in those countries. Approval procedures vary among jurisdictions and can involve

requirements and administrative review periods different from, and greater than, those in the United States, including additional preclinical studies or clinical trials as clinical studies conducted in one jurisdiction may not be accepted by regulatory authorities in other jurisdictions. In many jurisdictions outside the United States, a product candidate must be approved for reimbursement before it can be approved for sale in that jurisdiction. In some cases, the price that we intend to charge for our products is also subject to approval.

We may also submit marketing applications in other countries. Regulatory authorities in jurisdictions outside of the United States have requirements for approval of 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.

For instance, in the European Economic Area, or EEA, which is comprised of the Member States of the EU plus Norway, Iceland and Liechtenstein, medicinal products can only be commercialized after obtaining a Marketing Authorization, or MA. There are two types of MAs:

- Community MAs – These are issued by the European Commission through the Centralized Procedure, based on the opinion of the Committee for Medicinal Products for Human Use, or CHMP, of the EMA, and are valid throughout the entire territory of the EEA. The Centralized Procedure is compulsory for human medicines derived from biotechnology processes or advanced therapy medicinal products (such as gene therapy, somatic cell therapy and tissue engineered products), products that contain a new active substance indicated for the treatment of certain diseases, such as HIV/AIDS, cancer, neurodegenerative disorders, diabetes, autoimmune diseases and other immune dysfunctions, viral diseases, and officially designated orphan medicines. The Centralized Procedure is optional for products containing a new active substance not yet authorized in the EEA; for products that constitute a significant therapeutic, scientific or technical innovation; or for products that are in the interest of public health in the EU.
- National MAs – These are issued by the competent authorities of the Member States of the EEA and only cover their respective territory, are available for products not falling within the mandatory scope of the Centralized Procedure. Where a product has already been authorized for marketing in a Member State of the EEA, this National MA can be recognized in another Member State through the Mutual Recognition Procedure. If the product has not received a National MA in any Member State at the time of application, it can be approved simultaneously in various Member States through the Decentralized Procedure.

Requirements for the conduct of clinical trials in the European Union including Good Clinical Practice, or GCP, are set forth in the Clinical Trials Directive 2001/20/EC and the GCP Directive 2005/28/EC. Pursuant to Directive 2001/20/EC and Directive 2005/28/EC, as amended, a system for the approval of clinical trials in the European Union has been implemented through national legislation of the EU member states. Under this system, approval must be obtained from the competent national authority of each EU. member state in which a study is planned to be conducted. Furthermore, a clinical trial may only be started after a competent ethics committee has issued a favorable opinion on the clinical trial application in that country.

In April 2014, the EU passed the new Clinical Trials Regulation, (EU) No 536/2014, which will replace the current Clinical Trials Directive 2001/20/EC. To ensure that the rules for clinical trials are identical throughout the European Union, the new EU clinical trials legislation was passed as a regulation that is directly applicable in all EU member states. All clinical trials performed in the European Union are required to be conducted in accordance with the Clinical Trials Directive 2001/20/EC until the new Clinical Trials Regulation (EU) No 536/2014 becomes applicable. According to the current plans of EMA, the new Clinical Trials Regulation will become applicable in 2019.

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 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 may be subject to limitations on the approved indicated uses for which the products may be marketed or the conditions of approval, or contain requirements for potentially costly post-market testing and surveillance to monitor the safety and efficacy of the product candidates. We will be required to immediately report any serious and unexpected adverse events and certain quality or production problems with our products to regulatory authorities along with other periodic reports. The FDA may also require a risk evaluation and mitigation strategy, or REMS, as a condition of approval of our product candidates, which could include 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 submissions of safety and other post-marketing information and reports and registration, as well as continued compliance with cGMPs and GCPs for any clinical trials that we conduct post-approval. We will also have to comply with requirements concerning advertising and promotion for any of our product candidates that receive regulatory 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 adverse publicity;
- holds on clinical trials;
- refusal by regulatory authorities to approve pending applications or supplements to approved applications filed by us, or suspension or revocation of regulatory approvals;
- product seizure or detention, or refusal to permit the import or export of our product candidates; and
- injunctions or the imposition of civil or criminal penalties.

Any new legislation addressing drug or biologic products could result in delays in product development or commercialization, or increased costs to assure compliance. In addition, 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 United States or abroad. If we are slow or unable to adapt to changes in existing requirements or the adoption of new requirements or policies, or if we are not able to maintain regulatory compliance, we may lose any marketing approval that we may have obtained and we may not achieve or sustain profitability.

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

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

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

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.

Successful sales of our product candidates, if approved, depend, in part, on the availability of adequate coverage and reimbursement from third-party payors. In addition, because our product candidates represent new approaches to the treatment of cancer, we cannot accurately estimate the potential revenue from our product candidates.

Patients who are provided medical treatment for their conditions generally rely on third-party payors to reimburse all or part of the costs associated with their treatment. Adequate coverage and reimbursement from governmental healthcare programs, such as Medicare and Medicaid, and commercial payors is critical to new product acceptance. Additionally, obtaining coverage and adequate reimbursement for our products may be particularly difficult because of the higher prices often associated with drugs administered under the supervision of a physician. Separate reimbursement for the product itself or the treatment or procedure in which our product

is used may not be available. A decision by a third-party payor not to cover or separately reimburse for our products or procedures using our products, could reduce physician utilization of our products once approved. Assuming there is coverage for our product candidates, or procedures using our product candidates by a third-party payor, the resulting reimbursement payment rates may not be adequate or may require co-payments that patients find unacceptably high.

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

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

Obtaining coverage and reimbursement approval of a product from a government or other third-party payor is a time-consuming and costly process that could require us to provide to the payor supporting scientific, clinical and cost-effectiveness data for the use of our products. Even if we obtain coverage for a given product, the resulting reimbursement payment rates might not be adequate for us to achieve or sustain profitability or may require co-payments that patients find unacceptably high. Further, we plan to develop our product candidates for use in combination with other products, which may make them cost prohibitive or less likely to be covered by third-party payors. Patients are unlikely to use our product candidates unless coverage is provided and reimbursement is adequate to cover a significant portion of the cost of our product candidates.

In the United States, no uniform policy of coverage and reimbursement for products exists among third-party payors. Therefore, coverage and reimbursement for products can differ significantly from payor to payor. As a result, the coverage determination process is often a time-consuming and costly process that will require us to provide scientific, clinical and cost-effectiveness data and support for the use of our product candidates to each payor separately, with no assurance that coverage and adequate reimbursement will be obtained. We intend to seek approval to market our product candidates in both the United States and in selected foreign jurisdictions. If we obtain approval in one or more foreign jurisdictions for our product candidates, we will be subject to rules and regulations in those jurisdictions.

Our product candidates may be subject to government price controls that may affect our revenue.

There has been heightened governmental scrutiny in the United States and abroad of pharmaceutical pricing practices in light of the rising cost of prescription drugs and biologics. In the United States, at the federal level such scrutiny has resulted in several recent congressional inquiries and proposed 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. Congress and the Trump administration have each indicated that they will continue to seek new legislative and/or administrative measures to control drug costs. 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. Outside of the United States, particularly in the EU, the pricing of prescription pharmaceuticals is subject to governmental control. In these countries, pricing negotiations with governmental authorities can take considerable time after the receipt of marketing approval for a product. To obtain coverage and reimbursement or pricing approval in some countries, we may be required to conduct a clinical trial that compares the cost-effectiveness of our product candidate to other available therapies. If reimbursement of our products is unavailable or limited in scope or amount, or if pricing is set at unsatisfactory levels, our business could be harmed.

Recently enacted and future legislation may increase the difficulty and cost for us to obtain marketing approval of and commercialize our product candidates and affect the prices we may obtain.

Third-party payors, whether domestic or foreign, governmental or commercial, are developing increasingly sophisticated methods of controlling healthcare costs. In both the United States and certain foreign jurisdictions, there have been a number of legislative and regulatory changes to health care systems that could impact our ability to sell our products profitably. In particular, in March 2010, the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act, collectively, the Affordable Care Act, was enacted. The Affordable Care Act and its implementing regulations, among other things, subjected biologic products to potential competition by lower-cost biosimilars, addressed a new methodology by which rebates owed by manufacturers under the Medicaid Drug Rebate Program are calculated for certain drugs and biologics, including our product candidates, that are inhaled, infused, instilled, implanted or injected, increased the minimum Medicaid rebates owed by manufacturers under the Medicaid Drug Rebate Program, extended the Medicaid Drug Rebate Program to utilization of prescriptions of individuals

enrolled in Medicaid managed care organizations, subjected manufacturers to new annual fees and taxes for certain branded prescription drugs, provided incentives to programs that increase the federal government's comparative effectiveness research and established a new Medicare Part D coverage gap discount program, in which manufacturers must agree to offer point-of-sale discounts off negotiated prices of applicable brand drugs to eligible beneficiaries during their coverage gap period, as a condition for the manufacturer's outpatient drugs to be covered under Medicare Part D.

Some of the provisions of the Affordable Care Act have yet to be implemented, and there have been judicial and Congressional challenges to certain aspects of the Affordable Care Act, as well as recent efforts by the Trump administration to repeal or replace certain aspects of the Affordable Care Act. The Tax Act includes a provision repealing, effective January 1, 2019, the tax-based shared responsibility payment imposed by the Affordable Care Act on certain individuals who fail to maintain qualifying health coverage for all or part of a year (this requirement was commonly referred to as the "individual mandate"). On December 14, 2018, a U.S. District Court Judge in the Northern District of Texas, ruled that the individual mandate is a critical and inseverable feature of the Affordable Care Act, and therefore, because it was repealed as part of the Tax Act, the remaining provisions of the Affordable Care Act are invalid as well. While the Trump Administration and CMS have both stated that the ruling will have no immediate effect, it is unclear how this decision, subsequent appeals, if any, and other efforts to repeal and replace the Affordable Care Act will impact the Affordable Care Act and our business. Congress may consider other legislation to repeal or replace other elements of the Affordable Care Act. Thus, the full impact of the Affordable Care Act, or any law replacing elements of it, on our business remains unclear. The implementation of cost containment measures or other healthcare reforms may prevent us from being able to generate revenue, attain profitability or commercialize our drugs.

Other legislative changes have been proposed and adopted in the United States since the Affordable Care Act was enacted. In August 2011, the Budget Control Act of 2011, among other things, included aggregate reductions of Medicare payments to providers of 2% per fiscal year, which went into effect in April 2013, and will remain in effect through 2027 unless additional Congressional action is taken. In January 2013, President Obama signed into law the American Taxpayer Relief Act of 2012, or the ATRA, which, among other things, further reduced Medicare payments to several providers, including hospitals and cancer treatment centers, and increased the statute of limitations period for the government to recover overpayments to providers from three to five years.

There have been, and likely will continue to be, legislative and regulatory proposals at the foreign, federal and state levels directed at broadening the availability of healthcare and containing or lowering the cost of healthcare. For example, there have been several recent Congressional inquiries and proposed and enacted legislation designed to, among other things, bring more transparency to drug pricing, review the relationship between pricing and manufacturer's patient programs, and reform government program reimbursement methodologies for pharmaceutical products. At the federal level, Congress and the Trump administration have each indicated that it will continue to pursue new legislative and/or administrative measures to control drug costs. Individual states in the United States have also increasingly passed legislation and implemented regulations designed to control pharmaceutical 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 cannot predict the initiatives that may be adopted in the future. The continuing efforts of the government, insurance companies, managed care organizations and other payors of healthcare services to contain or reduce costs of healthcare and/or impose price controls may adversely affect:

- the demand for our product candidates, if we obtain regulatory approval;
- our ability to set prices that we believe are fair for our products;
- our ability to generate revenue and achieve or maintain profitability;
- the level of taxes that we are required to pay; and
- the availability of capital.

Any reduction in reimbursement from Medicare or other government programs may result in a similar reduction in payments from private payors, which may adversely affect our future profitability.

Legislative and regulatory proposals have been made to expand post-approval requirements and restrict sales and promotional activities for pharmaceutical products. We cannot be sure whether additional legislative changes will be enacted, or whether FDA regulations, guidance or interpretations will be changed, or what the impact of such changes on the regulatory approvals of our product candidates, if any, may be. In addition, increased scrutiny by the U.S. Congress of the FDA's approval process may significantly delay or prevent regulatory approval, as well as subject us to more stringent product labeling and post-marketing testing and other requirements.

Our current and future relationships with customers and third-party payors in the United States and elsewhere may be subject, directly or indirectly, to applicable anti-kickback, fraud and abuse, false claims, transparency, health information privacy and security and other healthcare laws and regulations, which could expose us to criminal sanctions, civil penalties, contractual damages, reputational harm, administrative burdens and diminished profits and future earnings.

Healthcare providers, physicians and third-party payors in the United States and elsewhere will play a primary role in the recommendation and prescription of any product candidates for which we obtain marketing approval. Our current and future arrangements with third-party payors, healthcare providers, patients and customers may expose us to broadly applicable fraud and abuse and other healthcare laws and regulations, including, without limitation, the federal Anti-Kickback Statute and the federal False Claims Act, which may constrain the business or financial arrangements and relationships through which we research, develop, sell, market and distribute any drugs for which we obtain marketing approval. In addition, we may be subject to transparency laws and patient privacy regulation by the U.S. federal and state governments and by governments in foreign jurisdictions in which we conduct our business. The applicable federal, state and foreign healthcare laws and regulations that may affect our ability to operate include:

- 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, 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. A person or entity can be found guilty of violating the statute without actual knowledge of the statute or specific intent to violate it. In addition, the government may assert that a claim including items or services resulting from a violation of the federal Anti-Kickback Statute constitutes a false or fraudulent claim for purposes of the federal False Claims Act;
- federal civil and criminal false claims laws, including the federal False Claims Act, and civil monetary penalty laws, 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 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. Similar to the federal Anti-Kickback Statute, a person or entity can be found guilty of violating these statutes without actual knowledge of the statutes or specific intent to violate them;
- HIPAA, as amended by the Health 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, relating to the privacy, security and transmission of individually identifiable health information without appropriate authorization;
- the federal Physician Payments Sunshine Act, created under the Affordable Care Act, and its implementing regulations, which require 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 United States Department of Health and Human Services, or 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 ownership and investment interests held by physicians and their immediate family members and payments or other "transfers of value" made to such physician owners;
- federal consumer protection and unfair competition laws, which broadly regulate marketplace activities and activities that potentially harm consumers; and
- analogous state and foreign laws and regulations, such as state anti-kickback and false claims laws, which may apply to sales or marketing arrangements and claims involving healthcare items or services reimbursed by non-governmental third-party payors, including private insurers; state and foreign laws that require pharmaceutical companies to comply with the pharmaceutical industry's voluntary compliance guidelines and the relevant compliance guidance promulgated by the federal government or otherwise restrict payments that may be made to healthcare providers; state and foreign laws that require drug manufacturers to report information related to payments and other transfers of value to physicians and other healthcare providers or marketing expenditures and pricing information; and state and foreign laws governing the privacy and security of health information in certain circumstances, many of which differ from each other in significant ways and often are not preempted by HIPAA, thus complicating compliance efforts.

Because of the breadth of these laws and the narrowness of the statutory exceptions and regulatory safe harbors available under such laws, it is possible that some of our business activities, including our consulting arrangements with physicians, some of whom receive stock options as compensation for services provided, could be subject to challenge under one or more of such laws. The scope and enforcement of each of these laws is uncertain and subject to rapid change in the current environment of healthcare reform, especially in light of the lack of applicable precedent and regulations. Federal and state enforcement bodies have increased their scrutiny of interactions between healthcare companies and healthcare providers, which has led to a number of investigations, prosecutions, convictions and settlements in the healthcare industry. Responding to investigations can be time-and resource-consuming and can divert management's attention from the business. Additionally, as a result of these investigations, healthcare providers and entities may have to agree to additional onerous compliance and reporting requirements as part of a consent decree or corporate integrity agreement. Any such investigation or settlement could increase our costs or otherwise have a material and adverse effect on our business, financial condition and results of operations.

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 civil and criminal penalties, damages, fines, disgorgement, imprisonment, 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, exclusion from participation in federal and state healthcare programs and the curtailment or restricting of our operations, any of which could harm our ability to operate our business and our financial results. In addition, the approval and commercialization of any of our product candidates outside the United States will also likely subject us to foreign equivalents of the healthcare laws mentioned above, among other foreign laws.

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

Our research and development activities involve the controlled use of potentially hazardous substances, including chemical and biological materials, by us and our third-party manufacturers. We and our manufacturers are subject to federal, state and local laws and regulations in the United States governing the use, manufacture, storage, handling and disposal of medical and hazardous materials. Although we believe that our and 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 materially and adversely affect our business, financial condition and results of operations.

We are subject to governmental regulation and other legal obligations related to privacy, data protection and information security. Compliance with these requirements could result in additional costs and liabilities to us or inhibit our ability to collect and process data, and the failure to comply with such requirements could have a material adverse effect on our business, financial condition or results of operations.

Privacy and data security have become significant issues in the United States, Europe and in many other jurisdictions where we may in the future conduct our operations. As we receive, collect, process, use and store personal and confidential data, we are subject to diverse laws and regulations relating to data privacy and security, including, in the United States, HIPAA, and, in the EU and in the EEA, Regulation 2016/679, known as the General Data Protection Regulation, or GDPR. Compliance with these privacy and data security requirements is rigorous and time-intensive and may increase our cost of doing business, and despite those efforts, there is a risk that we may be subject to fines and penalties, litigation and reputational harm, which could materially and adversely affect our business, financial condition and results of operations.

In addition, the regulatory framework for the receipt, collection, processing, use, safeguarding, sharing and transfer of personal and confidential data is rapidly evolving and is likely to remain uncertain for the foreseeable future as new global privacy rules are being enacted and existing ones are being updated and strengthened. For example, on May 25, 2018, the GDPR took effect in Europe. The GDPR is directly applicable in each EU member state and applies to companies established in the EU as well as companies that collect and use personal data to offer goods or services to, or monitor the behavior of, individuals in the EU, including, for example, through the conduct of clinical trials. GDPR introduces more stringent data protection obligations for processors and controllers of personal data, and penalties and fines for failure to comply with GDPR are significant, including fines of up to €20 million or 4% of total worldwide annual turnover, whichever is higher.

Risks Related to Our Intellectual Property

If we are unable to protect our intellectual property rights or if our intellectual property rights are inadequate for our technology and product candidates, our competitive position could be harmed.

Our commercial success will depend in part on our ability to obtain and maintain patent and other intellectual property protection in the United States and other countries with respect to our proprietary technology and products. We rely on trade secret, patent, copyright and trademark laws, and confidentiality, licensing and other agreements with employees and third parties, all of which offer only limited protection. We seek to protect our proprietary position by filing and prosecuting patent applications in the United States and abroad related to our novel technologies and products that are important to our business.

The patent positions of biotechnology and pharmaceutical companies generally are highly uncertain, involve complex legal and factual questions and have been the subject of much litigation. As a result, the issuance, scope, validity, enforceability and commercial value of our patents, including those patent rights licensed to us by third parties, are highly uncertain. The steps we or our licensors have taken to protect our proprietary rights may not be adequate to preclude misappropriation of our proprietary information or infringement of our intellectual property rights, both inside and outside of the United States. Further, the examination process may require us or our licensors to narrow the claims for our pending patent applications, which may limit the scope of patent protection that may be obtained if these applications issue. The rights already granted under any of our currently issued patents or those licensed to us and those that may be granted under future issued patents may not provide us with the proprietary protection or competitive advantages we are seeking. If we or our licensors are unable to obtain and maintain patent protection for our technology and products, or if the scope of the patent protection obtained is not sufficient, our competitors could develop and commercialize technology and products similar or superior to ours, and our ability to successfully commercialize our technology and products may be adversely affected. It is also possible that we or our licensors will fail to identify patentable aspects of inventions made in the course of our development and commercialization activities before it is too late to obtain patent protection on them.

With respect to patent rights, we do not know whether any of the pending patent applications for any of our compounds or biologic products will result in the issuance of patents that effectively protect our technology or products, or if any of our issued patents or if any of our or our licensors' issued patents will effectively prevent others from commercializing competitive technologies and products. Publications of discoveries in the scientific literature often lag behind the actual discoveries, and patent applications in the United States and other jurisdictions are typically not published until 18 months after filing or in some cases not at all. Therefore, we cannot be certain that we or our licensors were the first to make the inventions claimed in our owned or licensed patents or pending patent applications, or that we or our licensors were the first to file for patent protection of such inventions.

Our pending applications cannot be enforced against third parties practicing the technology claimed in such applications unless and until a patent issues from such applications. Because the issuance of a patent is not conclusive as to its inventorship, scope, validity or enforceability, issued patents that we own or have licensed from third parties may be challenged in the courts or patent offices in the United States and abroad. Such challenges may result in the loss of patent protection, the narrowing of claims in such patents or the invalidity or unenforceability of such patents, which could limit our ability to stop others from using or commercializing similar or identical technology and products, or limit the duration of the patent protection for our technology and products. Protecting against the unauthorized use of our or our licensor's patented technology, trademarks and other intellectual property rights is expensive, difficult and may in some cases not be possible. In some cases, it may be difficult or impossible to detect third-party infringement or misappropriation of our intellectual property rights, even in relation to issued patent claims, and proving any such infringement may be even more difficult. For example, two of our patents, U.S. Patent Nos. 7,842,289 and 7,935,804, have previously been subject to reexamination proceedings in the U.S. Patent and Trademark Office, or USPTO, at the request of a third party.

Third parties may initiate legal proceedings alleging that we are infringing their intellectual property rights, the outcome of which would be uncertain and could harm our business.

Our commercial success depends upon our ability to develop, manufacture, market and sell our product candidates, and to use our related proprietary technologies without infringing the intellectual property rights of third parties. We may become party to, or threatened with, future adversarial proceedings or litigation regarding intellectual property rights with respect to our product candidates, including interference or derivation proceedings before the USPTO. Third parties may assert infringement claims against us based on existing patents or patents that may be granted in the future. If we are found to infringe a third party's intellectual property rights, we could be required to obtain a license from such third party to continue commercializing our product candidates. However, we may not be able to obtain any required license on commercially reasonable terms or at all. Under certain circumstances, we could be forced, including by court order, to cease commercializing our product candidates. In addition, in any such proceeding or litigation, we could also be found liable for monetary damages. A finding of infringement could prevent us from commercializing our product candidates or force us to cease some of our business operations, which could materially and adversely affect our business, financial condition and results of operations. Any claims by third parties that we have misappropriated their confidential information or trade secrets could have a similar negative impact on our business, financial condition and results of operations.

While our product candidates are in preclinical studies and clinical trials, we believe that their use in these preclinical studies and clinical trials falls within the scope of the exemptions provided by 35 U.S.C. Section 271(e) in the United States, which generally exempts from patent infringement liability activities reasonably related to the development and submission of information to the FDA. As our product candidates progress toward commercialization, the possibility of a patent infringement claim against us increases. We attempt to ensure that our product candidates and the methods we employ to manufacture them, as well as the methods for their use that we intend to promote, do not infringe other parties' patents and other proprietary rights. We cannot assure you they do not, however, and competitors or other parties may assert that we infringe their proprietary rights in any event.

In addition, we are testing our product candidates administered with other product candidates or products that are covered by patents held by other companies or institutions. In the event that a labeling instruction is required in product packaging recommending that combination, we could be accused of, or held liable for, infringement of the third-party patents covering the product candidate or product recommended for administration with our product candidates. In such a case, we could be required to obtain a license from the other company or institution to use the required or desired package labeling, which may not be available on commercially reasonable terms, or at all.

If we breach any of our license agreements, it could have a material adverse effect on our commercialization efforts for our product candidates.

Our commercial success depends on our ability, and the ability of our licensors and collaborators, to develop, manufacture, market and sell our product candidates and use our licensors' or collaborators' proprietary technologies without infringing the property rights of third parties. For example, we have entered into license agreements with Karagen Pharmaceuticals, Inc. and the Regents of the University of California and a consortium of universities led by Memorial Sloan Kettering related to STING Activators, and we expect to enter into additional licenses in the future. If we fail to comply with the obligations under these agreements, including payment and diligence terms, our licensors may have the right to terminate these agreements, in which event we may not be able to develop, manufacture, market or sell any product that is covered by these agreements or may face other penalties under the agreements. Such an occurrence could materially adversely affect the value of the product candidate being developed under any such agreement. Termination of these agreements or reduction or elimination of our rights under these agreements may result in our having to negotiate new or reinstated agreements, which may not be available to us on equally favorable terms, or at all, or cause us to lose our rights under these agreements, including our rights to intellectual property or technology important to our development programs.

We have granted Lilly and Merck rights to control certain matters related to our intellectual rights for our licensed products. Our inability to control the filing, prosecution, maintenance and enforcement of such patents could materially and adversely affect our business, financial condition and results of operations.

As part of our license and collaboration agreements with Merck and Lilly related to anti-CD27 and cGAS STING pathway molecules, respectively, we have granted Merck and Lilly the first rights to prosecute certain patent rights and we are required to consult with Merck and Lilly with respect to infringement and defense matters related to certain licensed patents. Further, Merck has rights to determine the strategy for patent term extensions for anti-CD27 and we are required to cooperate with Lilly with respect to obtaining patent term extensions for certain patents related to the cGAS STING pathway program. Our inability to control these intellectual property rights could materially harm our business. For example, if a third party is infringing our patent covering anti-CD27, by marketing a product that is identical or similar to anti-CD27, Merck would have the initial right to enforce the patent against the third party and may make decisions with which we may not agree. Further, Merck may decide not to apply for extension of any term of a licensed patent that may otherwise be eligible for extension, which could decrease the royalties for the sale of products relating to such patents.

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

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

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

The laws of certain foreign countries may not protect our rights to the same extent as the laws of the United States, and these foreign laws may also be subject to change. For example, methods of treatment and manufacturing processes may not be patentable in certain jurisdictions, and the requirements for patentability may differ in certain countries, particularly developing countries. Furthermore, generic and/or biosimilar product 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.

Generic or biosimilar product manufacturers may develop, seek approval for, and launch generic or biosimilar versions, respectively, of our products. The FDA has published four draft guidance documents on biosimilar product development. For the FDA to approve a biosimilar product as interchangeable with a reference product, the agency must find that the biosimilar product can be expected to produce the same clinical results as the reference product and, for products administered multiple times, the biosimilar and the reference biologic may be switched after one has been previously administered without increasing safety risks or risks of diminished efficacy relative to exclusive use of the reference biologic. However, complexities associated with the larger, and often more complex, structures of biological products, as well as the process by which such products are manufactured, pose significant hurdles to implementation, which are still being worked out by the FDA. To date, no biosimilar or interchangeable biologic has been licensed under the Biologics Price Competition and Innovation Act of 2009, or BPCIA, framework, although such approvals have occurred in Europe, and it is anticipated that the FDA will approve a biosimilar in the relatively near future. If any of our product candidates are approved by the FDA, the approval of a biologic product biosimilar to one of our products could materially and adversely affect our business, financial condition and results of operations. In particular, a biosimilar could be significantly less costly to bring to market and priced significantly lower than our products, if approved by the FDA.

Some jurisdictions may require us to grant licenses to third parties. Such compulsory licenses could be extended to include some of our product candidates, which may limit our potential revenue opportunities.

Many countries, including European Union countries, have compulsory licensing laws under which a patent owner may be compelled under certain circumstances 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 and our licensors' efforts to enforce intellectual property rights around the world may be inadequate to obtain a significant commercial advantage from the intellectual property that we own or license.

Patent terms may be inadequate to protect our competitive position on our products for an adequate amount of time, and our product candidates for which we intend to seek approval as biologic products may face competition sooner than anticipated.

Given the amount of time required for the development, testing and regulatory review of new product candidates, such as our product candidates, patents protecting such candidates might expire before or shortly after such candidates are commercialized. Currently, we own or license patent families that cover STING Activators, which, expire, or if issued will expire, between 2025 and 2038, subject to any extensions. We expect to seek extensions of patent terms in the United States and, if available, in other countries where we are prosecuting patents. In the United States, the Drug Price Competition and Patent Term Restoration Act of 1984 permits a patent term extension of up to five years beyond the normal expiration of the patent, which is limited to the approved indication (or any additional indications approved during the period of extension). However, the applicable authorities, including the FDA and the USPTO in the United States, and any equivalent regulatory authority in other countries, may not agree with our assessment of whether such extensions are available, and may refuse to grant extensions to our patents, or may grant more limited extensions than we request. If this occurs, our competitors may be able to take advantage of our investment in development and clinical trials by referencing our clinical and preclinical data and launch their product earlier than might otherwise be the case.

The BPCIA established legal authority for the FDA to review and approve biosimilar biologics, including the possible designation of a biosimilar as "interchangeable" based on its similarity to an existing branded product. Under the BPCIA, an application for a biosimilar product cannot be approved by the FDA until 12 years after the original branded product was approved under a BLA. The law is complex and is still being interpreted and implemented by the FDA. As a result, its ultimate impact, implementation and meaning are subject to uncertainty. While it is uncertain when such processes intended to implement BPCIA may be fully adopted by the FDA, any such processes could have a material adverse effect on the future commercial prospects for our biological products.

We anticipate being awarded market exclusivity for each of our biological product candidates that is subject to its own BLA for 12 years in the United States, 10 years in Europe and significant durations in other markets. However, the term of the patents that cover such product candidates may not extend beyond the applicable market exclusivity awarded by a particular country. For example, in the United States, if all of the patents that cover our particular biologic product expire before the 12-year market exclusivity expires, a third party could submit a marketing application for a biosimilar product four years after approval of our biologic product, and the FDA could immediately review the application and approve the biosimilar product for marketing 12 years after approval of our biologic. Alternatively, a third party could submit a BLA for a similar or identical product any time after approval of our biologic product, and the FDA could immediately review and approve the similar or identical product for marketing and the third party could begin marketing the similar or identical product upon expiry of all of the patents that cover our particular biologic product.

Additionally, there is a risk that this exclusivity could be shortened due to congressional action or otherwise, or that the FDA will not consider our product candidates to be reference products for competing products, potentially creating the opportunity for generic competition sooner than anticipated. The extent to which a biosimilar, once approved, will be substituted for any one of our reference products in a way that is similar to traditional generic substitution for non-biological products is not yet clear, and will depend on a number of marketplace and regulatory factors that are still developing.

Changes in patent law could increase the uncertainties and costs surrounding the prosecution of our patent applications and the enforcement or defense of our issued patents.

As is the case with other pharmaceutical companies, our success is heavily dependent on intellectual property, particularly patents. Obtaining and enforcing patents in the pharmaceutical industry involves technological and legal complexity, and obtaining and enforcing pharmaceutical patents is costly, time-consuming and inherently uncertain. Changes in either the patent laws or interpretation of the patent laws in the United States and other countries may diminish the value of our patents or narrow the scope of our patent protection. For example, the U.S. Supreme Court has ruled on several patent cases in recent years, either narrowing the scope of patent protection available in certain circumstances or weakening the rights of patent owners in certain situations. In addition to increasing uncertainty with regard to our and our licensors' 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 Congress, the federal courts and the USPTO, the laws and regulations governing patents could change in unpredictable ways that would weaken our and our licensors' ability to obtain new patents or to enforce existing patents and patents we and our licensors may obtain in the future. Recent patent reform legislation could increase the uncertainties and costs surrounding the prosecution of our and our licensors' patent applications and the enforcement or defense of our or our licensors' issued patents.

For instance, under the Leahy-Smith America Invents Act, or the Leahy-Smith Act, U.S. patent applications containing or at that at any time contained a claim not entitled to priority before March 16, 2013 are subject to a "first to file" system, in which the first inventor to file a patent application will be entitled to the patent. This "first to file" system requires us to be cognizant of the time from invention to filing of a patent application. Since patent applications in the United States and most other countries are confidential for a period of time after filing, we cannot be certain that we were the first to file any patent application related to our product candidates. Furthermore, for United States 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.

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. If we or our licensors fail to maintain the patents and patent applications covering our product candidates, our competitive position would be adversely affected.

We may become involved in lawsuits to protect or enforce our intellectual property, which could be expensive, time consuming and unsuccessful and have a material and adverse effect on our business, financial condition and results of operations.

Competitors may infringe our patents or misappropriate or otherwise violate our intellectual property rights. To counter infringement or unauthorized use, litigation may be necessary in the future to enforce or defend our intellectual property rights, to protect our trade secrets or to determine the validity and scope of our own intellectual property rights or the proprietary rights of others. Also, third parties may initiate legal proceedings against us or our licensors to challenge the validity or scope of intellectual property rights we own or control. These proceedings can be expensive and time consuming. Many of our current and potential competitors have the ability to dedicate substantially greater resources to defend their intellectual property rights than we can. Accordingly, despite our efforts, we may not be able to prevent third parties from infringing upon or misappropriating our intellectual property. Litigation could result in substantial costs and diversion of management resources, which could harm our business and financial results. In addition, in an infringement proceeding, a court may decide that a patent owned by or licensed to us is invalid or 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 proceeding could put one or more of our patents at risk of being invalidated, held unenforceable or interpreted narrowly. Furthermore, because of the substantial amount of discovery required in connection with intellectual property litigation, there is a risk that some of our confidential information could be compromised by disclosure during this type of litigation. There could also be public announcements of the results of hearings, motions or other interim proceedings or developments in any such proceedings. If securities analysts or investors perceive these results to be negative, it could have a material adverse effect on the price of shares of our common stock.

We may be subject to claims by third parties asserting that our licensors, employees or we have misappropriated their intellectual property, or claiming ownership of what we regard as our own intellectual property.

Many of our employees and our licensors' employees, including our senior management, were previously employed at universities or at other biotechnology or pharmaceutical companies, including our competitors or potential competitors. Some of these employees, including each member of our senior management, executed proprietary rights, non-disclosure and non-competition agreements, or similar agreements, in connection with such previous employment. Although we try to ensure that our employees do not use the proprietary information or know-how of others in their work for us, we may be subject to claims that we or these employees have used or disclosed intellectual property, including trade secrets or other proprietary information, of any such third party. Litigation may be necessary to defend against such claims. If we fail in defending any such claims, in addition to paying monetary damages, we may lose valuable intellectual property rights or personnel or sustain damages. Such intellectual property rights could be awarded to a third party, and we could be required to obtain a license from such third party to commercialize our technology or products. Such a license may not be available on commercially reasonable terms or at all. Even if we are successful in defending against such claims, litigation could result in substantial costs and be a distraction to management.

Intellectual property rights do not necessarily address all potential threats to our competitive advantage.

The degree of future protection afforded by our intellectual property rights is uncertain because intellectual property rights have limitations, and may not adequately protect our business, or permit us to maintain our competitive advantage. The following examples are illustrative:

- Others may be able to make compounds or biologics that are the same as or similar to our product candidates but that are not covered by the claims of the patents that we own or have exclusively licensed.
- We or our licensors or any strategic partners might not have been the first to make the inventions covered by the issued patents or pending patent applications that we own or have exclusively licensed.
- We or our licensors might not have been the first to file patent applications covering certain of our inventions.
- Others may independently develop similar or alternative technologies or duplicate any of our technologies without infringing our intellectual property rights.
- It is possible that our pending patent applications will not lead to issued patents.
- Issued patents that we own or have licensed may not provide us with any competitive advantages, or may be held invalid or unenforceable as a result of legal challenges.
- Our competitors might conduct research and development activities in the United States and other countries that provide a safe harbor from patent infringement claims for certain research and development activities, as well as in countries where we do not have patent rights and then use the information learned from such activities to develop competitive products for sale in our major commercial markets.
- We may not develop additional proprietary technologies that are patentable.
- The patents of others may have an adverse effect on our business.

If we are unable to protect the confidentiality of our proprietary information and know-how, the value of our technology and products could be adversely affected.

In addition to patent protection, we also rely on other proprietary rights, including protection of trade secrets, know-how and confidential and proprietary information. To maintain the confidentiality of trade secrets and proprietary information, we enter into confidentiality agreements with our employees, consultants and collaborators upon the commencement of their relationships with us. These agreements require that all confidential information developed by the individual or made known to the individual by us during the course of the individual's relationship with us be kept confidential and not disclosed to third parties. Our agreements with employees also provide that any inventions conceived by the individual in the course of rendering services to us shall be our exclusive property. However, we may not obtain these agreements in all circumstances, and individuals with whom we have these agreements may not comply with their terms. In the event of unauthorized use or disclosure of our trade secrets or proprietary information, these agreements, even if obtained, may not provide meaningful protection, particularly for our trade secrets or other confidential information. To the extent that our employees, consultants or contractors use technology or know-how owned by third parties in their work for us, disputes may arise between us and those third parties as to the rights in related inventions.

Adequate remedies may not exist in the event of unauthorized use or disclosure of our confidential information. The disclosure of our trade secrets would impair our competitive position and may materially and adversely affect our business, financial condition and results of operations.

Risks Related to Our Financial Results

Our operating results may fluctuate significantly, which makes our future operating results difficult to predict and could cause our operating results to fall below expectations or our guidance.

Our quarterly and annual operating results may fluctuate significantly in the future, which makes it difficult for us to predict our future operating results. From time to time, in addition to existing agreements with Novartis, Merck and Lilly, we may enter into license or collaboration agreements with other companies that include development funding and significant upfront and milestone payments and/or royalties, which may become an important source of our revenue. Accordingly, our revenue may depend on development funding and the achievement of development and clinical milestones under current and any potential future license and collaboration agreements and sales of our products, if approved. These upfront and milestone payments may vary significantly from period to period and any such variance could cause a significant fluctuation in our operating results from one period to the next.

In addition, we measure compensation cost for stock-based awards made to employees at the grant date of the award, based on the fair value of the award as approved by the compensation committee and sub-committees, and recognize the cost as an expense over the employee's requisite service period. As the variables that we use as a basis for valuing these awards change over time, including our underlying stock price and stock price volatility, the magnitude of the expense that we must recognize may vary significantly.

Furthermore, our operating results may fluctuate due to a variety of other factors, many of which are outside of our control and may be difficult to predict, including the following:

- the timing and cost of, and level of investment in, research and development activities relating to our current and any future product candidates, which will change from time to time;
- our ability to enroll patients in clinical trials and the timing of enrollment;
- the cost of manufacturing our current and any future product candidates, which may vary depending on FDA guidelines and requirements, the quantity of production and the terms of our agreements with manufacturers;
- expenditures that we will or may incur to acquire or develop additional product candidates and technologies;
- the timing and outcomes of clinical studies for our product candidates or competing product candidates;
- competition from existing and potential future drugs that compete with our product candidates, and changes in the competitive landscape of our industry, including consolidation among our competitors or partners;
- any delays in regulatory review or approval of our product candidates;
- the level of demand for our product candidates, if approved, which may fluctuate significantly and be difficult to predict;
- the risk/benefit profile, cost and reimbursement policies with respect to our products candidates, if approved, and existing and potential future drugs that compete with our product candidates;
- our ability to commercialize our product candidates, if approved, inside and outside of the United States, either independently or working with third parties;

- our ability to establish and maintain collaborations, licensing or other arrangements;
- our ability to adequately support future growth;
- potential unforeseen business disruptions that increase our costs or expenses;
- future accounting pronouncements or changes in our accounting policies; and
- the changing and volatile global economic environment.

The cumulative effect of these factors could result in large fluctuations and unpredictability in our quarterly and annual operating results. As a result, comparing our operating results on a period-to-period basis may not be meaningful. Investors should not rely on our past results as an indication of our future performance. This variability and unpredictability could also result in our failing to meet the expectations of industry or financial analysts or investors for any period. If our revenue or operating results fall below the expectations of analysts or investors or below any forecasts we may provide to the market, or if the forecasts we provide to the market are below the expectations of analysts or investors, the price of our common stock could decline substantially. Such a stock price decline could occur even when we have met any previously publicly stated revenue and/or earnings guidance we may provide.

The recently passed comprehensive tax reform bill could materially and adversely affect our business, financial condition and results of operations.

On December 22, 2017, the Tax Act was enacted. The Tax Act, among other things, contains significant changes to corporate taxation, including (1) reduction of the corporate tax rate from a top marginal rate of 35% to a flat rate of 21%; (2) limitation of the tax deduction for interest expense, generally to 30% of adjusted earnings (as specifically calculated for this purpose); (3) for net operating losses generated after 2017, limitation of the deduction to 80% of current year taxable income, indefinite carryforwards, and elimination of carrybacks; (4) certain changes in the treatment of offshore earnings regardless of whether they are repatriated; (5) mandatory capitalization of research and development expenses beginning in 2022; (6) immediate deductions for certain new investments instead of deductions for depreciation expense over time; (7) further deduction limits on executive compensation; and (8) modifying, repealing and creating many other business deductions and credits, including the reduction in the orphan drug credit from 50% to 25% of qualifying expenditures. Due to the broad complexities of the Tax Act, under the guidance of Staff Accounting Bulletin 118, the Company previously provided a provisional estimate of the effect of the Tax Act in our financial statements. In the fourth quarter of 2018, we completed our analysis to determine the effect of the Tax Act and recorded immaterial adjustments as of December 31, 2018.

Our ability to use net operating loss carryforwards to offset future taxable income, and our ability to use tax credit carryforwards, may be subject to certain limitations.

Our ability to use our federal and state net operating losses to offset potential future taxable income and related income taxes that would otherwise be due is dependent upon our generation of future taxable income before the expiration dates of the net operating losses, and we cannot predict with certainty when, or whether, we will generate sufficient taxable income to use all of our net operating losses. In addition, a corporation that undergoes an "ownership change" under Section 382 of the Internal Revenue Code of 1986, as amended, or the Code, is subject to limitations on its ability to utilize its pre-change net operating loss carryforwards, or NOLs, to offset future taxable income and its ability to utilize tax credit carryforwards. As of December 31, 2018, we reported U.S. federal, state and foreign NOLs of approximately $102.8 million, $64.4 million and $49.9 million, respectively.

Under Section 382 of the Code our ability to utilize NOL carryforwards or other tax attributes, such as federal tax credits, in any taxable year may be limited if we have experienced an "ownership change." Generally, a Section 382 ownership change occurs if one or more stockholders or groups of stockholders who owns at least 5% of a corporation's stock increases its ownership by more than 50 percentage points over its lowest ownership percentage within a specified testing period. Similar rules may apply under state tax laws. We believe that we may have experienced an ownership change under Section 382, which will result in limitations in our ability to utilize net operating losses and credits. In addition, we may experience future ownership changes as a result of future offerings or other changes in the ownership of our stock. As a result, the amount of the NOLs and tax credit carryforwards presented in our financial statements could be limited and may expire unutilized.

Risks Related to Ownership of Our Common Stock

The price of our common stock may be volatile, and you could lose all or part of your investment.

The trading price of our common stock has been, and is likely to continue to be, highly volatile and could be subject to wide fluctuations in response to various factors, some of which are beyond our control, including limited trading volume and as a result of the factors discussed in this "Risk Factors" section and elsewhere in this Annual Report on Form 10-K among others.

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

An active trading market for our common stock may not be maintained.

Our common stock is currently traded on the Nasdaq Global Select Market, but we can provide no assurance that we will be able to maintain an active trading market for our shares on the Nasdaq Global Select Market or any other exchange in the future. If there is no active market for our common stock, it may be difficult for our stockholders to sell shares without depressing the market price for the shares or at all.

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

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

Our principal stockholders and management own a significant percentage of our common stock and will be able to exert significant control over matters subject to stockholder approval.

Our executive officers, directors and 5% stockholders together beneficially own a significant percentage of our voting stock. These stockholders may be able to determine the outcome of matters requiring stockholder approval. For example, these stockholders may be able to control 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 other stockholders believe are in their best interests.

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

We prepare our financial statements in conformity with accounting principles generally accepted in the United States. These accounting principles are subject to interpretation by the Financial Accounting Standards Board, or FASB, and the SEC. A change in these policies or interpretations could have a significant effect on our reported financial results, may retroactively affect previously reported results, could cause unexpected financial reporting fluctuations, and may require us to make costly changes to our operational processes and accounting systems.

Our revenue to date has been primarily derived from research and license agreements, which can result in significant fluctuation in our revenue from period to period, and our past revenue is therefore not necessarily indicative of our future revenue.

Our revenue is primarily derived from our research and license agreements, from which we receive upfront fees, contract research payments, milestone and other contingent payments based on clinical progress, regulatory progress or net sales achievements and royalties. Significant variations in the timing of receipt of cash payments and our recognition of revenue can result from significant payments based on the execution of new research and license agreements, the timing of clinical outcomes, regulatory approval, commercial launch or the achievement of certain annual sales thresholds. The amount of our revenue derived from research and license agreements in any given period will depend on a number of unpredictable factors, including our ability to find and maintain suitable collaboration partners, the timing of the negotiation and conclusion of collaboration agreements with such partners, whether and when we or our collaboration partners achieve clinical, regulatory and sales milestones, the timing of regulatory approvals in one or more major markets, reimbursement levels by private and government payers, and the market introduction of new drugs or generic versions of the approved drug, as well as other factors. Our past revenue generated from these agreements is not necessarily indicative of our future revenue. If any of our existing or future collaboration partners terminates our collaboration, fails to develop, obtain regulatory approval for, manufacture or ultimately commercialize any product candidate under our collaboration agreement, our business, financial condition, and results of operations could be materially and adversely affected.

Once we are no longer an emerging growth company we will be subject to additional laws and regulations affecting public companies that will increase our costs and the demands on management and could harm our operating results.

As a public company we are subject to the reporting requirements of the Securities Exchange Act of 1934, as amended, which requires, among other things, that we file with the Securities and Exchange Commission, or the SEC, annual, quarterly and current reports with respect to our business and financial condition as well as other disclosure and corporate governance requirements. However, as an emerging growth company we may take advantage of exemptions from various requirements such as an exemption from the requirement to have our independent auditors attest to our internal control over financial reporting under Section 404 of the Sarbanes-Oxley Act of 2002 as well as an exemption from the "say on pay" voting requirements pursuant to the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010. Once we are no longer an emerging growth company, we will be required to comply with these additional legal and regulatory requirements applicable to public companies and will incur significant legal, accounting and other expenses to do so. If we are not able to comply with the requirements in a timely manner or at all, our financial condition or the market price of our common stock may be harmed. For example, if we or our independent auditor identifies deficiencies in our internal control over financial reporting that are deemed to be material weaknesses we could face additional costs to remedy those deficiencies, the market price of our stock could decline or we could be subject to sanctions or investigations by the SEC or other regulatory authorities, which would require additional financial and management resources.

We will remain an emerging growth company until the earliest of (1) December 31, 2020, (2) the last day of the fiscal year (a) in which we have total annual gross revenue of at least $1.07 billion or (b) in which we are deemed to be a large accelerated filer, which requires the market value of our common stock that is held by non-affiliates to exceed $700.0 million as of the prior June 30th, and (3) the date on which we have issued more than $1.0 billion in non-convertible debt during the prior three-year period. We cannot predict when we will no longer be an emerging growth company.

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.

Sales of a substantial number of shares of our common stock in the public market could occur at any time. These sales, or the perception in the market that the holders of a large number of shares intend to sell shares, could reduce the market price of our common stock. Moreover, holders of certain shares of our common stock have rights, subject to certain conditions, to require us to file registration statements covering their shares or to include their shares in registration statements that we may file for ourselves or other stockholders. For example, on August 2, 2017, we filed a registration statement on Form S-3 to register for resale shares held by Morningside Venture (IV) Investments Limited and Ultimate Keen Limited, which together hold 14,908,031 shares of our common stock. We have registered all currently reserved shares of common stock that we may issue under our equity compensation plans and intend to register in the future any additional reserved or issued shares of common stock. These registered 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 2015 Plan, 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 may be needed in the future to continue our planned operations, including conducting clinical trials, commercialization efforts, 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. If we sell common stock, convertible securities or other equity securities, investors may be materially diluted by subsequent sales. Such sales may also result in material dilution to our existing stockholders, and new investors could gain rights, preferences and privileges senior to the holders of our common stock.

Pursuant to our equity incentive plans, our compensation committee is authorized to grant equity-based incentive awards to our employees, non-employee directors and consultants. Future grants of restricted stock units, options and other equity awards and issuances of common stock under our equity incentive plans will result in dilution and may have an adverse effect on the market price of our common stock.

Additionally, the number of shares of our common stock reserved for issuance under our 2015 Plan will automatically increase on January 1 of each year, beginning on January 1, 2016 and continuing through and including January 1, 2025, by 4% of the total number of shares of our capital stock outstanding on December 31 of the preceding calendar year or a lesser number of shares determined by our board of directors. Further, the number of shares of our common stock reserved for issuance under our 2015 ESPP will automatically increase on January 1 of each year, beginning on January 1, 2016 and continuing through and including January 1, 2025, by 1% of the total number of shares of common stock outstanding on December 31 of the preceding calendar year or a lesser number of shares determined by our board of directors. Unless our board of directors elects not to increase the number of shares available for future grant each year, our stockholders may experience additional dilution, which could cause our stock price to fall.

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 means that all stockholder actions must 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 preferred stock on terms determined by the board of directors without stockholder approval and which 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 stockholders to elect directors of their choosing or cause us to take other corporate actions stockholders may 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 provides that the Court of Chancery of the State of Delaware will be the exclusive forum for substantially all disputes between us and our stockholders, which could limit our stockholders' ability to obtain a favorable judicial forum for disputes with us or our directors, officers or employees.

Our amended and restated certificate of incorporation provides that the Court of Chancery of the State of Delaware is the exclusive forum for any derivative action or proceeding brought on our behalf, any action asserting a breach of fiduciary duty, any action asserting a claim against us arising pursuant to the Delaware General Corporation Law, our amended and restated certificate of incorporation or our amended and restated bylaws, or any action asserting a claim against us that is governed by the internal affairs doctrine. This provision 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 such lawsuits against us and our directors, officers and other employees. Alternatively, if a court were to find this provision in our amended and restated certificate of incorporation to be inapplicable or unenforceable in an action, we may incur additional costs associated with resolving such action in other jurisdictions, which could materially and adversely affect our business, financial condition and results of operations.

If securities or industry analysts 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. If one or more of the analysts who covers us downgrades our stock or publishes inaccurate or unfavorable research about our business, our stock price may decline. If one or more of these analysts ceases coverage of our company or fails to publish reports on us regularly, demand for our common stock could decrease, which might cause our stock price and trading volume to decline.

In addition, as required by Accounting Standards Update, or ASU, No. 2014-09, *Revenue from Contracts with Customers*, which was adopted beginning January 1, 2018, we disclose the aggregate amount of the transaction price allocated to performance obligations that are unsatisfied (or partially unsatisfied) as of the end of the reporting period. Market practices surrounding the calculation of this measure are still evolving. It is possible that analysts and investors could misinterpret our disclosure or that the terms of our research or license agreements or other circumstances could cause our methods for preparing this disclosure to differ significantly from others, which could lead to inaccurate or unfavorable forecasts by analysts and investors.

Regardless of accuracy, unfavorable interpretations of our financial information and other public disclosures could have a negative impact on our stock price. If our financial performance fails to meet analyst estimates, for any of the reasons discussed above or otherwise, or one or more of the analysts who cover us downgrade our common stock or change their opinion of our common stock, our stock price would likely decline.

Item 1B. Unresolved Staff Comments.

None.

Item 2. Properties.

We moved into our corporate office and laboratory facility located in Berkeley, California in August 2016. We lease approximately 110,853 square feet pursuant to an Office/Laboratory lease that was entered into in September 2015, or the Heinz Lease. We began incurring rent expense when the landlord delivered possession of the facility to us in March 2016. The Heinz Lease has an initial term of approximately thirteen and a half years expiring on December 31, 2029. We have the right to further extend the Heinz Lease term for up to two renewal terms of five years each, provided that the rental rate would be subject to market adjustment at the beginning of each renewal term. We are subleasing approximately 30,885 square feet in our Heinz facilities under subleases that expire on or before December 31, 2020.

We continued to lease our former office and research and development facility comprised of 25,000 square feet in Berkeley, California, under a non-cancelable operating lease, or the Bancroft Lease, through December 31, 2018. We subleased the Bancroft facility during 2018. The term of the Bancroft Lease expired on December 31, 2018.

We also lease a research and development facility in Oss, the Netherlands, for employees of Aduro Biotech Europe. The term of the Oss lease has been extended through December 2020, with a one-year renewal option. We believe that our existing facilities are adequate to meet our current needs, and that suitable additional alternative spaces will be available in the future on commercially reasonable terms.

Item 3. Legal Proceedings.

We are not currently subject to any material legal proceedings.

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 Price of Common Stock

Our common stock has been listed on the Nasdaq Global Select Market under the symbol "ADRO" since April 15, 2015. Prior to that date, there was no public trading market for our common stock.

On February 22, 2019, the last reported sale price of our common stock on the Nasdaq Global Select Market was $4.09 per share.

Holders of Record

As of February 22, 2019, we had 115 holders of record of our common stock. The actual number of stockholders is greater than this number of record holders, and includes stockholders who are beneficial owners, but whose shares are held in street name by brokers and other nominees. This number of holders of record also does not include stockholders whose shares may be held in trust by other entities.

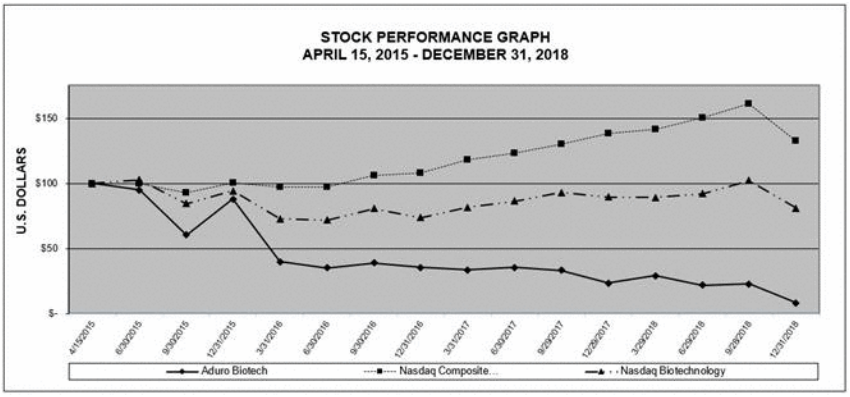
Dividend Policy

We have never declared or paid cash dividends on our capital stock. We intend to retain all available funds and any future earnings, if any, to fund the development and expansion of our business and we do not anticipate paying any cash dividends in the foreseeable future. Any future determination related to dividend policy will be made at the discretion of our board of directors.

Stock Performance Graph

This performance graph shall not be deemed "soliciting material" or to be "filed" with the SEC for purposes of Section 18 of the Securities Exchange Act of 1934, as amended (Exchange Act), or otherwise subject to the liabilities under that Section, and shall not be deemed to be incorporated by reference into any of our filings under the Securities Act of 1933, as amended, or the Exchange Act.

The graph below shows the cumulative total stockholder return assuming the investment of $100.00 in our common stock, The Nasdaq Global Market Index, and the Nasdaq Biotechnology Index for the period commencing on April 15, 2015 (the first day of trading of our common stock) and ending on December 31, 2018. The comparisons in the table are required by the Securities and Exchange Commission and are not intended to forecast or be indicative of future performance of our common stock. All amounts are shown are based on the closing price with the exception of April 15, 2015 which is the opening price based on initial trading of Aduro stock.



Recent Sales of Unregistered Securities

None.

Repurchases of Shares or of Company Equity Securities

None.

Item 6. Selected Financial Data.

The selected consolidated financial data included in this section are not intended to replace the consolidated financial statements included elsewhere in this Annual Report on Form 10-K. We derived the selected consolidated statements of operations data for the years ended December 31, 2018, 2017 and 2016 and the selected consolidated balance sheet data at December 31, 2018 and 2017 from our audited consolidated financial statements included elsewhere in this report. The selected consolidated statement of operations data for the years ended December 31, 2015 and 2014 and the selected consolidated balance sheet data at December 31, 2016, 2015 and 2014 are derived from our audited consolidated financial statements which are not included in this report. Our historical results are not necessarily indicative of the results that may be expected in the future. You should read the selected historical consolidated financial data below in conjunction with the section titled "Management's Discussion and Analysis of Financial Condition and Results of Operations" and the audited consolidated financial statements included elsewhere in this report.

	Year Ended December 31,				
	2018	2017	2016	2015	2014
	(in thousands, except share and per share data)				
Consolidated Statements of Operations Data:					
Revenue:					
Collaboration and license revenue	$ 15,087	$ 17,109	$ 50,593	$ 71,689	$ 13,038
Grant revenue	—	130	88	1,290	351
Total revenue	15,087	17,239	50,681	72,979	13,389
Operating expenses:					
Research and development(1)	75,836	89,382	87,718	58,649	23,513
General and administrative(1)	36,035	33,751	34,277	27,805	8,994
Loss on impairment of intangible assets	3,992	—	—	—	—
Amortization of intangible assets	584	559	549	89	—
Total operating expenses	116,447	123,692	122,544	86,543	32,507
Loss from operations	(101,360)	(106,453)	(71,863)	(13,564)	(19,118)
Loss from remeasurement of fair value of warrants	—	—	—	(26,077) (4)	(566)
Gain on extinguishment of convertible promissory notes	—	—	—	—	3,553 (2)
Interest income (expense), net	5,284	3,444	2,219	494	(2,395) (3)
Other (expense) income, net	(64)	(218)	(40)	(161)	1,512
Loss before income tax	(96,140)	(103,227)	(69,684)	(39,308)	(17,014)
Income tax benefit (provision)	783	11,364	(21,464)	99	—
Net loss	$ (95,357)	$ (91,863)	$ (91,148)	$ (39,209)	$ (17,014)
Net loss per common share, basic and diluted	$ (1.21)	$ (1.26)	$ (1.40)	$ (0.88)	$ (53.06)
Shares used in computing net loss per common share, basic and diluted	78,812,407	72,901,215	65,200,762	44,706,393	320,686

(1) Includes stock-based compensation as follows:

	Year Ended December 31,				
	2018	2017	2016	2015	2014
	(in thousands)				
Research and development	$ 9,745	$ 9,205	$ 9,131	$ 2,493	$ 202
General and administrative	7,729	7,171	5,875	5,937	368
Total stock-based compensation	$ 17,474	$ 16,376	$ 15,006	$ 8,430	$ 570

(2) Upon the conversion of convertible promissory notes to related parties into Series C convertible preferred stock in May 2014, a gain on extinguishment was recorded because the amount allocated to reacquire the convertible notes was less than the carrying value of the notes.

(3) Includes amortization of debt discount associated with convertible promissory notes due to the issuance of warrants and beneficial conversion feature associated with such convertible promissory notes.

(4) In 2015, the Company remeasured warrants to their fair value of $27.1 million and recognized a loss from remeasurement of $26.1 million. The carrying value of the warrants of $27.1 million was reclassified to additional paid-in capital.

	As of December 31,				
	2018	2017	2016	2015	2014
	(in thousands)				
Consolidated Balance Sheet Data:					
Cash, cash equivalents and marketable securities	$ 277,873	$ 349,717	$ 361,906	$ 431,045	$ 119,456
Working capital	252,459	308,730	324,132	393,438	81,006
Total assets	357,504	445,128	438,611	481,825	126,462
Convertible preferred stock warrant liability	—	—	—	—	100
Common stock warrant liability	—	—	—	—	889
Convertible preferred stock	—	—	—	—	139,963
Accumulated deficit	(404,532)	(283,863)	(192,000)	(100,852)	(61,643)
Total stockholders' equity (deficit)	135,311	237,473	227,220	261,622	(61,297)

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

You should read the following discussion and analysis of our financial condition and results of operations together with the section of this Annual Report on Form 10-K titled "Selected Financial Data" and our consolidated financial statements included elsewhere in this report. This discussion and other parts of this report contain forward-looking statements that involve risk and uncertainties, such as statements of our plans, objectives, expectations and intentions. As a result of many factors, including those factors set forth in the "Risk Factors" section of this report, our actual results could differ materially from the results described in or implied by the forward-looking statements contained in the following discussion and analysis.

Overview

We are an immunotherapy company focused on the discovery, development and commercialization of therapies that are designed to harness the body's natural immune system for the treatment of patients with challenging diseases. Our primary technologies related to the Stimulator of Interferon Genes (STING) and A Proliferation Inducing Ligand (APRIL) pathways have led to what we believe is a strong pipeline of clinical candidates that are being investigated in cancer, autoimmune and inflammatory diseases. Our product candidates are designed to stimulate and/or regulate innate and adaptive immune responses, particularly in combination with other novel immunotherapies. We are collaborating with a number of leading global pharmaceutical companies to help expand and drive our product pipeline. Our strategy is to rapidly advance best-in-class therapies from our STING and APRIL technologies through clinical development and regulatory approval.

Our STING pathway activator technology is designed to activate the intracellular STING receptor, which may result in a potent tumor-specific immune response. We are developing STING pathway activator product candidates, including ADU-S100 (MIW815), in oncology under our worldwide collaboration with Novartis Pharmaceuticals Corporation, or Novartis. ADU-S100, the first STING pathway activator to enter the clinic, is being evaluated in a Phase 1 clinical trial as a single agent and in an ongoing Phase 1b combination trial with spartalizumab (PDR001), an investigational anti-PD-1 monoclonal antibody, in patients with cutaneously accessible metastatic solid tumors or lymphomas. Preliminary results and observations from these trials were presented at the Society for Immunotherapy of Cancer's (SITC) 33rd Annual Meeting in November 2018. We also have initiated a Phase 1 trial of ADU-S100 in combination with YERVOY® (ipilimumab), an approved anti-CTLA-4 antibody for the treatment of relapsed and refractory melanoma. We expect to initiate a Phase 1b/2 clinical trial of ADU-S100 with an approved anti-PD-1 monoclonal antibody in patients with squamous cell carcinoma of the head and neck (SCCHN) in the second half of 2019.

APRIL is a soluble factor that binds to BCMA and TACI receptors thereby inducing signaling, and is implicated in IgA nephropathy, multiple myeloma and other cancer indications. BION-1301, a first-in-class a fully blocking monoclonal antibody that blocks APRIL binding to both the BCMA and TACI receptors, is being evaluated in IgA Nephropathy as well as an ongoing Phase 1/2 clinical trial for multiple myeloma. We expect to initiate a Phase 1 clinical trial of BION-1301 in healthy volunteers as part of our plan to evaluate BION-1301 in IgA nephropathy patients in the first half of 2019.

In addition to our current STING pathway product candidates that activate the STING receptor, we are developing product candidates that are designed to prevent or control immune responses through the STING pathway as part of our cGAS-STING pathway inhibitor program. In December 2018, we entered into a research collaboration and exclusive license agreement with Eli Lilly and Company, or Lilly, for our cGAS-STING pathway inhibitor program for the research and development of novel inhibitor product candidates for autoimmune and other inflammatory diseases.

In January 2019, we announced a strategic reset to focus primarily on the discovery and development of novel product candidates in the STING and APRIL pathways. As a result of the strategic reset, we reduced our current workforce by approximately 37% and redirected resources to these lead programs. The reduction in ongoing operating expenses is expected to extend our cash, cash equivalents and marketable securities into 2022, exclusive of potential future milestone payments from our collaborations with Novartis, Lilly and Merck.

Since commencing our operations, our efforts have been focused on research, development and the advancement of our product candidates into clinical trials. As a result, we have incurred significant losses. We have funded our operations primarily through the sale of common stock, licensing agreements with pharmaceutical partners and revenue from government grants. We incurred a net loss of $95.4 million, $91.9 million and $91.1 million for the years ended December 31, 2018, 2017 and 2016, respectively. At December 31, 2018, our cash, cash equivalents and marketable securities totaled $277.9 million and our accumulated deficit was $404.5 million. We have intellectual property protection on our STING and APRIL technologies and each of our product candidates, some of which we believe can be maintained into 2039.

Components of Operating Results

Revenue

We have not generated any revenue from product sales. Our revenue to date has been primarily derived from our collaboration and license agreements. Our collaboration agreements may include the transfer of intellectual property rights in the form of licenses, promises to provide research and development services and promises to participate on certain development committees with the collaboration party. The terms of such agreements include payment to us of one or more of the following: nonrefundable upfront fees, payment for research and development services, development, regulatory and commercial milestone payments, and royalties on net sales of licensed products.

Revenue associated with nonrefundable upfront license fees where the license fees and research and development activities cannot be accounted for as separate performance obligations is deferred and recognized as revenue over the expected period of performance based on a cost-based input method. Revenue from contingent development, regulatory and commercial milestones, when not deemed probable of significant reversal of cumulative revenue, is also recognized over the performance period based on a similar method. Where we have no remaining performance obligations, revenue from such milestones is recognized when the accomplishment of the milestones is deemed probable.

We expect that any revenue we generate from our current collaborations, research and license agreements and any future collaboration partners will fluctuate from year to year as a result of the timing and amount of milestones and other payments.

Research and Development Expenses

The largest component of our total operating expenses has historically been our investment in research and development activities, including the clinical development of our product candidates. Research and development expenses represent costs incurred to conduct research, such as the discovery and development of our product candidates, as well as the development of product candidates pursuant to our research and license agreements with Novartis, Lilly and Merck. We recognize all research and development costs as they are incurred. Clinical trial costs, contract manufacturing and other development costs incurred by third parties are expensed as the contracted work is performed.

As a result of our strategic reset, we expect our research and development expenses to be focused on the clinical advancement of our STING and APRIL product candidates. The actual probability of success for our product candidates and technologies may be affected by a variety of factors including: the quality of our product candidates, early clinical data, investment in our clinical programs, competition, manufacturing capability and commercial viability. We may never succeed in obtaining regulatory approval for any of our product candidates. As a result of the uncertainties discussed above, we are unable to determine the duration and completion costs of our research and development projects or when and to what extent we will generate revenue from the commercialization and sale of our product candidates.

The following table summarizes our research and development costs by technology:

	Year Ended December 31,		
	2018	2017	2016
	(in thousands)		
B-select	$ 21,641	$ 28,977	$ 9,927
LADD	13,712	22,964	37,789
STING	13,345	11,098	15,492
Other research and development costs	9,233	8,912	11,404
Subtotal	57,931	71,951	74,612
Stock-based compensation	9,745	9,205	9,131
Facility costs and depreciation	8,160	8,226	3,975
Total research and development	$ 75,836	$ 89,382	$ 87,718

Other research and development costs include early research programs, sponsored research grants and laboratory supplies and materials.

General and Administrative Expenses

General and administrative expenses include personnel costs, expenses for outside professional services and other allocated expenses. Personnel costs consist of salaries, bonuses, benefits and stock-based compensation. Outside professional services consist of legal, accounting and audit services, insurance expenses, investor relations activities, administrative services and other consulting fees. Allocated expenses consist of rent expense related to our offices and research and development facility.

Interest Income, Net

Interest income, net primarily consists of interest income from our cash equivalents and marketable securities.

Other Expense, Net

Other expense, net primarily consists of foreign currency transaction gains and losses.

Income Tax Benefit

We are subject to income taxes in the United States and foreign jurisdictions in which we do business. These foreign jurisdictions have statutory tax rates different from those in the United States. Accordingly, our effective tax rates will vary depending on the relative proportion of foreign to U.S. income, the availability of research and development tax credits, changes in the valuation of our deferred tax assets and liabilities and changes in tax laws. We regularly assess the likelihood of adverse outcomes resulting from the examination of our tax returns by the Internal Revenue Service, or IRS, and other tax authorities to determine the adequacy of our income tax reserves and expense. Should actual events or results differ from our current expectations, charges or credits to our income tax expense may become necessary.

Results of Operations

Comparison of the Years Ended December 31, 2018 and 2017

	Year Ended December 31,		Change
	2018	2017	$
		(in thousands)	
Revenue:			
Collaboration and license revenue	$ 15,087	$ 17,109	$ (2,022)
Grant revenue	—	130	(130)
Total revenue	15,087	17,239	(2,152)
Operating expenses:			
Research and development	75,836	89,382	(13,546)
General and administrative	36,035	33,751	2,284
Loss on impairment of intangible assets	3,992	—	3,992
Amortization of intangible assets	584	559	25
Total operating expenses	116,447	123,692	(7,245)
Loss from operations	(101,360)	(106,453)	5,093
Interest income, net	5,284	3,444	1,840
Other expense, net	(64)	(218)	154
Loss before income tax	(96,140)	(103,227)	7,087
Income tax benefit	783	11,364	(10,581)
Net loss	$ (95,357)	$ (91,863)	$ (3,494)

Revenue

Total revenue decreased by $2.2 million for the year ended December 31, 2018 as compared to the year ended December 31, 2017, primarily due to the change in revenue recognition methodology as a result of adopting ASU No. 2014-09, Revenue from Contracts with Customers, (Topic 606) on January 1, 2018, which resulted in a change in revenue recognized under our Novartis Agreement. The following table is a summary of our collaboration and license revenue for the years ended December 31, 2018 and 2017:

	Year Ended December 31,		Change
	2018	2017	$
	(in thousands)		
Collaboration and license revenue:			
Novartis	$ 11,896	$ 14,935	$ (3,039)
Merck	3,004	2,014	990
Other	187	160	27
Total collaboration and license revenue	$ 15,087	$ 17,109	$ (2,022)

Research and Development Expenses

The following table summarizes our research and development expenses incurred during the years ended December 31, 2018 and 2017:

	Year Ended December 31,		Change
	2018	2017	$
	(in thousands)		
Compensation and related personnel costs	$ 21,292	$ 22,377	$ (1,085)
Stock-based compensation expense	9,745	9,205	540
Clinical development	8,548	9,308	(760)
Contract research	8,378	8,870	(492)
Facility costs and depreciation	8,163	8,226	(63)
Contract manufacturing	6,381	13,533	(7,152)
Professional services	5,540	3,818	1,722
Supplies and materials	5,383	5,414	(31)
Licensing fees	926	670	256
Other	1,480	7,961	(6,481)
Total research and development	$ 75,836	$ 89,382	$ (13,546)

Research and development expenses were $75.8 million for the year ended December 31, 2018, a decrease of $13.5 million compared to the year ended December 31, 2017. The decrease was primarily due to lower contract manufacturing expense for APRIL and anti-CTLA-4 antibody as well as lower clinical development and contract research expenses following the discontinuation of CRS-207 development in the fourth quarter of 2017. In addition, there was a decrease in other research and development costs primarily related to the revaluation of contingent consideration for our anti-CTLA-4 antibody in 2017.

General and Administrative Expenses

The following table summarizes our general and administrative expenses incurred during the years ended December 31, 2018 and 2017:

	Year Ended December 31,		Change
	2018	2017	$
	(in thousands)		
Professional services	$ 11,148	$ 8,622	$ 2,526
Compensation and related personnel costs	10,243	10,633	(390)
Stock-based compensation expense	7,729	7,171	558
Facility costs and depreciation	4,076	3,953	123
Other	2,839	3,372	(533)
Total general and administrative	$ 36,035	$ 33,751	$ 2,284

General and administrative expenses were $36.0 million for the year ended December 31, 2018, an increase of $2.3 million compared to the year ended December 31, 2017. The increase was primarily due to higher professional services costs due to consulting services, as well as higher stock-based compensation expense.

Loss on impairment of intangible assets

Loss on impairment of intangible assets was $4.0 million for the year ended December 31, 2018. There was no loss recorded in prior years. The loss was recorded due to our decision to discontinue one of our acquired early research programs in the fourth quarter of 2018 resulting in impairment of the acquired IPR&D asset.

Interest Income, Net

Interest income, net was $5.3 million for the year ended December 31, 2018, an increase of $1.8 million, compared to the year ended December 31, 2017. The increase in interest income earned in 2018 was primarily due to the increased interest rates.

Other Expense, Net

Other expense, net was $64,000 for the year ended December 31, 2018, a decrease of $154,000 compared to the year ended December 31, 2017. The decrease was primarily related to fluctuations from foreign currency transaction gains and losses.

Income tax benefit

Income tax benefit was $783,000 for the year ended December 31, 2018 compared to an income tax benefit of $11.4 million the year ended December 31, 2017. The change was primarily related to current federal income tax benefit associated with an increase in the carryback of the 2017 losses to the 2016 tax year.

Comparison of the Years Ended December 31, 2017 and 2016

	Year Ended December 31,		Change
	2017	2016	$
		(in thousands)	
Revenue:			
Collaboration and license revenue	$ 17,109	$ 50,593	$ (33,484)
Grant revenue	130	88	42
Total revenue	17,239	50,681	(33,442)
Operating expenses:			
Research and development	89,382	87,718	1,664
General and administrative	33,751	34,277	(526)
Amortization of intangibles	559	549	10
Total operating expenses	123,692	122,544	1,148
Loss from operations	(106,453)	(71,863)	(34,590)
Interest income, net	3,444	2,219	1,225
Other expense, net	(218)	(40)	(178)
Loss before income tax	(103,227)	(69,684)	(33,543)
Income tax benefit (provision)	11,364	(21,464)	32,828
Net loss	$ (91,863)	$ (91,148)	$ (715)

Revenue

Total revenue decreased by $33.5 million for the year ended December 31, 2017 as compared to the year ended December 31, 2016, primarily due to the decrease in collaboration and license revenue of $33.5 million. The following table is a summary of our collaboration and license revenue for the years ended December 31, 2017 and 2016:

	Year Ended December 31,		Change
	2017	2016	
	(in thousands)		
Collaboration and license revenue:			
Novartis	$ 14,935	$ 49,815	$ (34,880)
Janssen	—	302	(302)
Merck	2,014	279	1,735
Other	160	197	(37)
Total collaboration and license revenue	$ 17,109	$ 50,593	$ (33,484)

Collaboration and license revenue was $17.1 million for the year ended December 31, 2017, compared to $50.6 million for the year ended December 31, 2016. The decrease in revenue for the year ended December 31, 2017 was primarily due to the recognition of a $35.0 million milestone payment in 2016 in connection with the clinical advancement of ADU-S100 under our agreement with Novartis, partially offset by the recognition of $2.0 million in connection with the achievement of a milestone under our agreement with Merck in 2017.

Research and Development Expenses

The following table summarizes our research and development expenses incurred during the years ended December 31, 2017 and 2016:

	Year Ended December 31,		Change
	2017	2016	$
	(in thousands)		
Compensation and related personnel costs	$ 22,377	$ 16,476	$ 5,901
Contract manufacturing	13,533	23,139	(9,606)
Clinical development	9,308	10,499	(1,191)
Stock-based compensation expense	9,205	9,131	74
Contract research	8,870	5,011	3,859
Facility costs and depreciation	8,226	3,975	4,251
Supplies and materials	5,414	4,139	1,275
Professional services	3,818	5,252	(1,434)
Licensing fees	670	8,099	(7,429)
Other	7,961	1,997	5,964
Total research and development	$ 89,382	$ 87,718	$ 1,664

Research and development expenses were $89.4 million for the year ended December 31, 2017, an increase of $1.7 million compared to the year ended December 31, 2016. The increase was primarily due to higher personnel related costs of $5.9 million due to increased headcount and an increase of $4.3 million primarily due to the relocation of our office and laboratory facility in the third quarter of 2016. In addition, there was a $6.0 million increase in other research and development costs which included the revaluation of contingent consideration for our anti-CTLA-4 antibody and a $1.3 million increase in supplies and materials related to our anti-CTLA-4 and anti-APRIL antibodies. Contract research increased by $3.9 million primarily due to sponsored research grants made to UC Berkeley. These increases in expenses were partially offset by decreases in contract manufacturing expenses of $9.6 million and clinical development expenses of $1.2 million, primarily related to GVAX Pancreas manufacturing activities in early 2016, which did not occur in 2017. The expenses were also offset by a decrease in licensing fees of $7.4 million due to payments made in 2016 in relation to our STING Activator technology as well as lower professional services and consulting costs of $1.4 million.

General and Administrative Expenses

The following table summarizes our general and administrative expenses incurred during the years ended December 31, 2017 and 2016:

	Year Ended December 31,		Change
	2017	2016	$
	(in thousands)		
Compensation and related personnel costs	$ 10,633	$ 10,723	$ (90)
Professional services	8,622	10,147	(1,525)
Stock-based compensation expense	7,171	5,875	1,296
Facility costs and depreciation	3,953	4,295	(342)
Other	3,372	3,237	135
Total general and administrative	$ 33,751	$ 34,277	$ (526)

General and administrative expenses were $33.8 million for the year ended December 31, 2017, a decrease of $0.5 million, compared to the year ended December 31, 2016. The decrease was primarily due to lower professional services of $1.6 million and lower allocation of facility costs to general and administrative expense. The decrease was partially offset by an increase in stock-based compensation expense of $1.3 million due to the issuance of restricted stock units during 2017.

Interest Income, Net

Interest income, net was $3.4 million for the year ended December 31, 2017, an increase of $1.2 million, compared to the year ended December 31, 2016. The increase in interest income earned in 2017 was primarily due to the increased interest rates.

Other Expense, Net

Other expense, net was a net expense of $218,000 for the year ended December 31, 2017, an increase of $178,000 compared to a net expense of $40,000 for the year ended December 31, 2016. The increase was primarily related to fluctuations from foreign currency transaction gains and losses.

Income tax benefit (provision)

Income tax benefit was $11.4 million for the year ended December 31, 2017 compared to an income tax provision of $21.5 million the year ended December 31, 2016. The change was primarily related to a current federal income benefit associated with the carryback of the 2017 loss versus 2016 income tax expense related to current federal income taxes on deferred revenue recognized in 2016.

Liquidity and Capital Resources

To date, our operations have been financed primarily through the public issuance of common stock, sale of convertible preferred stock and proceeds from our collaboration and license agreements. At December 31, 2018, we had cash, cash equivalents and marketable securities of $277.9 million. We believe that our available cash, cash equivalents and marketable securities will be sufficient to fund our planned operations into 2022. We have based our cash sufficiency estimate on assumptions that may prove to be incorrect. If our assumptions prove to be incorrect, we could consume our available capital resources sooner than we currently expect or in excess of amounts that we currently expect, which could adversely affect our development activities.

In August 2017, we entered into an “at-the-market” sales agreement, as amended in February 2019, or the 2017 Sales Agreement, with Cowen and Company, LLC, or Cowen, through which we may offer and sell shares of our common stock having an aggregate offering price of up to $100.0 million through Cowen, acting as sales agent. We agreed to pay Cowen a commission of up to 3% of the gross proceeds of sales made through the arrangement. There were no sales of shares of common stock pursuant to the 2017 Sales Agreement during the year ended December 31, 2018. As of December 31, 2018, we had an aggregate of $81.5 million remaining for future sales under the 2017 Sales Agreement, subject to the continued effectiveness of our shelf registration statement on Form S-3 (Registration No. 333-219639) or an effective replacement shelf registration statement.

Our primary uses of capital are, and we expect will continue to be, compensation and related expenses, clinical, development costs including manufacturing, and other research and development services, laboratory and related supplies and legal and other professional services. Cash used to fund operating expenses is impacted by the timing of when we pay expenses, as reflected in the change in our outstanding accounts payable and accrued expenses. We expect to incur substantial expenditures in the foreseeable future for the development, manufacturing and potential commercialization of our product candidates.

We plan to continue to fund our operations and capital funding needs through equity and/or debt financing and potential milestones from existing collaboration agreements. We may also consider entering into additional collaboration arrangements or selectively partnering for clinical development and commercialization or outlicensing non-core assets. In addition, we expect to continue to opportunistically seek access to the equity capital markets to support our development efforts and operations. The sale of additional equity would result in additional dilution to our stockholders. The incurrence of debt financing would result in debt service obligations and the instruments governing such debt could provide for operating and financing covenants that would restrict our operations. To the extent that we raise additional funds through collaboration or partnering arrangements, we may be required to relinquish some of our rights to our technologies or rights to market and sell our products in certain geographies, grant licenses on terms that are not favorable to us, or issue equity that may be substantially dilutive to our stockholders. If we are not able to secure adequate additional funding, we may be forced to make reductions in spending, extend payment terms with suppliers, liquidate assets where possible and/or suspend or curtail planned programs. Any of these actions could harm our business, financial condition and results of operations.

Cash Flows

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

	Year Ended December 31,		
	2018	2017	2016
	(in thousands)		
Net cash (used in) provided by:			
Operating activities	$ (68,759)	$ (88,856)	$ (86,076)
Investing activities	39,407	88,941	(32,065) (1)
Financing activities	(1,495)	82,054	43,085
Effect of exchange rate changes	(457)	543	—
Net change in cash, cash equivalents, and restricted cash	$ (31,304)	$ 82,682	$ (75,056) (1)

(1) Due to the adoption of Accounting Standards Update No. 2016-18 issued by the Financial Accounting Standards Board, amount will differ from prior year filings by the amount of restricted cash on the balance sheet.

Operating Activities

Net cash used in operating activities was $68.8 million for the year ended December 31, 2018, compared to $88.9 million for the year ended December 31, 2017. The decrease in net cash used in operating activities during 2018 was primarily due to the receipt of $18.1 million from the IRS in November 2018 related to our carryback claim filed in September 2018 for the recovery of income taxes paid in 2016.

Net cash used in operating activities was $88.9 million for the year ended December 31, 2017, compared to $86.1 million for the year ended December 31, 2016. The increase in net cash used in operating activities during 2017 was due to additional headcount, higher facility related costs, increased clinical trial activities and other research and development activities.

Investing Activities

Net cash provided by investing activities was $39.4 million for the year ended December 31, 2018, compared to $88.9 million for the year ended December 31, 2017. The change was primarily due to timing of purchased marketable securities in 2018 as compared to 2017.

Net cash provided by investing activities was $88.9 million for the year ended December 31, 2017, compared to net cash used in investing activities of $32.1 million for the year ended December 31, 2016. The change was primarily due to lower expenditures for leasehold improvements and timing of purchased marketable securities in 2017 as compared to 2016.

Financing Activities

Net cash used in financing activities was $1.5 million for the year ended December 31, 2018, compared to net cash provided by financing activities of $82.1 million for the year ended December 31, 2017. The change was primarily due to cash proceeds in 2017 from the sale of our common stock under our "at-the-market" sales agreement that we entered into with Cowen in May 2016, or the 2016 Sales Agreement. There were no such sales during the year ended 2018.

Net cash provided by financing activities was $82.1 million for the year ended December 31, 2017, compared to $43.1 million for the year ended December 31, 2016. The increase was primarily related to higher net cash proceeds in 2017 from the sale of our common stock under our 2016 Sales Agreement with Cowen.

Critical Accounting Policies and Significant Judgments and Estimates

Our management's discussion and analysis of our financial condition and results of operations is based on our consolidated financial statements, which have been prepared in accordance with generally accepted accounting principles in the United States, or GAAP. The preparation of these consolidated financial statements requires us to make estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the date of the financial statements, as well as the reported revenue generated and expenses incurred during the reporting periods. Our estimates are based on our historical experience and on various other factors that we believe are reasonable under the circumstances, the results of which form the basis for making judgments about the carrying value of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions. We believe that the accounting policies discussed below are critical to understanding our historical and future performance, as these policies relate to the more significant areas involving management's judgments and estimates.

Revenue Recognition

Revenue from research activities under our collaboration arrangements is recognized when our customer obtains control of the promised goods or services, in an amount that reflects the consideration which we expect to receive in exchange for those goods or services. Revenue generated from our collaboration arrangements is not subject to repayment and typically includes upfront fees, development, regulatory and commercial milestone payments and royalties on the licensee's future product sales.

Our collaboration agreements may include the transfer of intellectual property rights in the form of licenses, promises to provide research and development services and promises to participate on certain development committees with the collaboration party. We assess whether the promises in these agreements are considered distinct performance obligations that should be accounted for separately. Judgment is required to determine whether licenses to our intellectual property are distinct from the research and development services or participation on development committees.

The transaction price in each agreement is allocated to the identified performance obligations based on the standalone selling price, or SSP, of each distinct performance obligation. Due to the early stage of our licensed technology, the license of such technology is typically combined with the research and development services and committee participation as one combined performance obligation.

Revenue associated with nonrefundable upfront license fees where the license fees and research and development activities cannot be accounted for as separate performance obligations is deferred and recognized as revenue over the expected period of performance using a cost-based input method. We utilize judgment to assess the pattern of delivery of the performance obligation. A cost-based input method of revenue recognition requires management to make estimates of costs to complete our performance obligations. In making such estimates, significant judgment is required to evaluate assumptions related to cost estimates. The cumulative effect of revisions to estimated costs to complete our performance obligations will be recorded in the period in which changes are identified and amounts can be reasonably estimated. A significant change in the assumptions and estimates could have a material impact on the timing and amount of revenue recognized in future periods.

At the inception of each agreement that includes development, regulatory or commercial milestone payments, we evaluate whether the milestones are considered probable of being reached and estimate the amount to be included in the transaction price by using the most likely amount method. If it is probable that a significant revenue reversal would not occur, the associated milestone value is included in the transaction price. The transaction price is allocated to each performance obligation in the agreement based on relative SSP. Milestone payments that are not within our or the licensee's control, such as regulatory approvals, are not considered probable of being achieved until those approvals are received. At the end of each subsequent reporting period, we re-evaluate the probability of achievement of each such milestone and any related constraint, and if necessary, adjust our estimates of the overall transaction price. Any such adjustments are recorded on a cumulative catch-up basis, which would affect revenues and earnings in the period of adjustment.

Goodwill and Intangible Assets

Goodwill represents the excess of the consideration transferred over the estimated fair value of assets acquired and liabilities assumed in a business combination. Intangible assets with indefinite useful lives are related to acquired in-process research and development, or IPR&D, projects and are measured at their respective fair values as of the acquisition date. Goodwill and intangible assets with indefinite useful lives are not amortized but are tested for impairment on an annual basis or more frequently if we become aware of any events or changes that would indicate the fair values of the assets are below their carrying amounts. Intangible assets related to IPR&D projects are considered to be indefinite-lived until the completion or abandonment of the associated research and development efforts. If and when development is complete, which generally occurs if and when regulatory approval to market a product is obtained, the associated assets are deemed finite-lived and are amortized based on their respective estimated useful lives at that point in time. We recorded an impairment loss of $4.0 million related to IPR&D during the year ended December 31, 2018. No impairment of IPR&D has been recorded in prior years. We have not had an impairment of goodwill since inception.

Intangible assets with finite useful lives are amortized over their estimated useful lives, primarily on a straight-line basis.

Impairment of Long-Lived Assets

We review our long-lived assets for impairment whenever events or changes in circumstances indicate the carrying amount of an asset may not be recoverable. Recoverability of assets held and used is measured by comparison of the carrying amount of an asset to the future undiscounted cash flows expected to be generated from the use of the asset and its eventual disposition. If such assets are considered to be impaired, the impairment to be recognized is measured by the amount by which the carrying amount exceeds the fair value of the impaired assets. Assets to be disposed of are reported at the lower of their carrying amount or fair value less cost to sell.

Accrued Research and Development Costs

We record accrued expenses for estimated costs of our research and development activities conducted by third-party service providers, which include the conduct of preclinical studies and clinical trials and contract manufacturing activities. We record the estimated costs of research and development activities based upon the estimated amount of services provided but not yet invoiced, and we include these costs in accrued liabilities in the consolidated balance sheets and within research and development expenses in the consolidated statement of operations and comprehensive loss. These costs are a significant component of our research and development expenses. We record accrued expenses for these costs based on the estimated amount of work completed and in accordance with agreements established with these third parties.

We estimate the amount of work completed through discussions with internal personnel and external service providers as to the progress or stage of completion of the services and the agreed-upon fee to be paid for such services. We make significant judgments and estimates in determining the accrued balance in each reporting period. As actual costs become known, we adjust our accrued estimates. Although we do not expect our estimates to be materially different from amounts actually incurred, our understanding of the status and timing of services performed, the number of patients enrolled and the rate of patient enrollment may vary from our estimates and could result in us reporting amounts that are too high or too low in any particular period. Our accrued expenses are dependent, in part, upon the receipt of timely and accurate reporting from clinical research organizations and other third-party service providers. To date, there have been no material differences from our accrued expenses to actual expenses.

Stock-Based Compensation

We account for stock-based compensation for all share-based awards made to employees and directors, including employee stock options, restricted stock units and employee stock purchases related to the Employee Stock Purchase Plan, by measuring the cost of awards of equity instruments based on the estimated fair value of the awards on the date of grant, net of estimated forfeitures. We estimate the grant date fair value using the Black-Scholes option-pricing model. The grant date fair value of the stock-based awards is generally recognized on a straight-line basis over the requisite service period, which is generally the vesting period of the respective awards.

We recorded stock-based compensation expense related to options granted of $11.7 million, $11.9 million, and $10.4 million during the years ended December 31, 2018, 2017 and 2016, respectively.

In determining the fair value of the stock-based awards, we use the Black-Scholes option-pricing model and assumptions discussed below. Each of these inputs is subjective and generally requires significant judgment to determine.

Fair Value of Common Stock. Prior to the IPO in April 2015, our board of directors determined the fair value of our common stock by taking into consideration, among other things, contemporaneous valuations of our common stock prepared by an unrelated third-party valuation firm in accordance with the guidance provided by the American Institute of Certified Public Accountants Practice Guide, Valuation of Privately-Held-Company Equity Securities Issued as Compensation. Given the previous absence of a public trading market for our common stock, our board of directors exercised reasonable judgment and considered a number of objective and subjective factors to determine the best estimate of the fair value of our common stock, including our stage of development; progress of our research and development efforts; the rights, preferences and privileges of our preferred stock relative to those of our common stock; equity market conditions affecting comparable public companies and the lack of marketability of our common stock.

Since the IPO, we have used the market closing price of our common stock as reported on the Nasdaq Global Select Market.

Expected Term. The expected term represents the period that stock-based awards are expected to be outstanding. We used the simplified method to determine the expected term, which is calculated as the mid-point between the vesting date and the end of the contractual term of the options.

Expected Volatility. Because we do not have a long trading history for our common stock, the expected volatility was estimated based on the average historical volatilities of common stock of comparable publicly traded entities over a period equal to the expected term of the stock option grants. The comparable companies were chosen based on their similar size, stage in the life cycle or area of specialty. We will continue to apply this process until a sufficient amount of historical information regarding the volatility of our own stock price becomes available.

Risk-Free Interest Rate. The risk-free interest rate is based on the U.S. Treasury zero coupon issues in effect at the time of grant for periods corresponding with the expected term of the option.

Expected Dividend. We have never paid dividends on our common stock and have no plans to pay dividends on our common stock. Therefore, we used an expected dividend yield of zero.

We recognize compensation expense for stock awards for the portion of the share-based awards that are expected to vest. Therefore, we estimate our forfeiture rate based on an analysis of our actual forfeitures and will continue to evaluate the adequacy of the forfeiture rate based on actual forfeiture experience, analysis of employee turnover behavior and other factors. The impact from any forfeiture rate adjustment would be recognized in full in the period of adjustment, and if the actual number of future forfeitures differs from our estimates, we might be required to record adjustments to stock-based compensation in future periods.

Income Taxes

The benefit for income taxes was $783,000 for the year ended December 31, 2018, a decrease of $10.6 million compared to the year ended December 31, 2017. The income tax benefit recorded during 2018 was primarily related to current federal income taxes benefit associated with a larger than anticipated carryback of the 2017 losses to the 2016 tax year.

We recognize deferred income taxes for temporary differences between the basis of assets and liabilities for financial statement and income tax purposes. We periodically evaluate the positive and negative evidence bearing upon realizability of our deferred tax assets. A full valuation allowance is maintained on the U.S. net deferred tax assets. A partial valuation allowance is maintained on the Netherlands NOL deferred tax asset. We intend to maintain the valuation allowance on the remaining net federal and state deferred tax assets until sufficient positive evidence exists to support valuation allowance reversals.

At December 31, 2018, we had net operating loss, or NOL, carryforwards (before tax effects) for federal, state and foreign income tax purposes of $102.8 million, $64.4 million and $49.9 million respectively. These federal, state and foreign NOL carryforwards will begin to expire in 2027, 2033 and 2025, respectively, if not utilized. In addition, we have federal and state tax credit carryforwards of $39.6 million and $7.9 million, respectively, to offset future income tax liabilities. The federal tax credits can be carried forward for 20 years and will start to expire in 2034, if not utilized, while the state tax credits can be carried forward indefinitely. Under Section 382 of the Internal Revenue Code of 1986, as amended, or the Code, our ability to utilize NOL carryforwards or other tax attributes, such as federal tax credits, in any taxable year may be limited if we have experienced an "ownership change."

We record unrecognized tax benefits as liabilities and adjust these liabilities when our judgment changes as a result of the evaluation of new information not previously available. Because of the complexity of some of these uncertainties, the ultimate resolution may result in a payment that is materially different from our current estimate of the unrecognized tax benefit liabilities. These differences will be reflected as increases or decreases to income tax expense in the period in which new information is available.

On December 22, 2017, the Tax Cuts and Jobs Act (the "Tax Act") was signed into law. Among other changes is a permanent reduction in the U.S. federal corporate income tax rate from 35% to 21% effective January 1, 2018. As a result of the reduction in the corporate income tax rate, we revalued our deferred tax assets, which resulted in a reduction in the value of our deferred tax asset of approximately $26.5 million, offset by the change in valuation allowance of $26.5 million, for the year ended December 31, 2017. In addition, the Tax Act repeals the two-year carryback for losses arising in tax years ending after 2017. As a result, we recognized deferred tax expense of $3.4 million, for the year ended December 31, 2017 due to the inability to carryback existing temporary differences after 2017.

Also on December 22, 2017, the SEC issued Staff Accounting Bulletin 118 ("SAB 118"), which provides guidance on accounting for tax effects of the Tax Act. SAB 118 provides a measurement period that should not extend beyond one year from the Tax Act enactment date for companies to complete the accounting under Accounting Standard Codification 740. In accordance with SAB 118, a company must reflect the income tax effects of those aspects of the Tax Act for which the accounting under ASC 740 is complete. To the extent that a company's accounting for certain income tax effects of the Tax Act is incomplete but it is able to determine a reasonable estimate, it must record a provisional estimate to be included in the financial statements. Provisional amounts or adjustments to provisional amounts identified in the measurement period, as defined, would be included as an adjustment to tax expense or benefit from continuing operations in the period the amounts are determined. Due to the broad complexities of the Tax Act, under the guidance of SAB 118, we previously provided a provisional estimate of the effect of the Tax Act in our financial statements. In the fourth quarter of 2018, we completed our analysis to determine the effect of the Tax Act and recorded immaterial adjustments as of December 31, 2018.

Off-Balance Sheet Arrangements

We did not have during the periods presented, and we do not currently have, any off-balance sheet arrangements, as defined under SEC rules.

Contractual Obligations and Other Commitments

The following table summarizes our contractual obligations at December 31, 2018:

	Payments due by period				
	Less than 1 year	1 to 3 years	3 to 5 years	More than 5 years	Total
	(in thousands)				
Operating leases	$ 5,519	$ 11,001	$ 11,030	$ 35,836	$ 63,386
Total contractual obligations	$ 5,519	$ 11,001	$ 11,030	$ 35,836	$ 63,386

We enter into agreements in the normal course of business with contract research organizations for clinical trials and with vendors for preclinical studies and other services and products for operating purposes which are cancelable at any time by us, generally upon 30 days prior written notice. These payments are not included in this table of contractual obligations.

We are obligated to make future payments to third parties under in-license agreements, including sublicense fees, royalties and payments that become due and payable on the achievement of certain development and commercialization milestones. As the amount and timing of sublicense fees and the achievement and timing of these milestones are not probable and estimable, such commitments have not been included on our consolidated balance sheets or in the contractual obligations table above.

JOBS Act

We are an "emerging growth company" as defined in the Jumpstart Our Business Startups Act, or the JOBS Act, and therefore we take advantage of certain exemptions from various public company reporting requirements, including not being required to have our internal control over financial reporting audited by our independent registered public accounting firm pursuant to Section 404 of the Sarbanes-Oxley Act of 2002, or the Sarbanes-Oxley Act, reduced disclosure obligations regarding executive compensation in our periodic reports and proxy statements and exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and any golden parachute payments. We may take advantage of these exemptions until we are no longer an "emerging growth company." We may remain an "emerging growth company" for up to five years. We will cease to be an "emerging growth company" upon the earliest of: (1) December 31, 2020, (2) the last day of the first fiscal year in which our annual gross revenues are $1.07 billion or more, (3) the date on which we have, during the previous rolling three-year period, issued more than $1.0 billion in non-convertible debt securities, and (4) the date on which we are deemed to be a "large accelerated filer" as defined in the Securities Exchange Act of 1934, as amended, or the Exchange Act. We have chosen to irrevocably opt out of the extended transition periods available under the JOBS Act for complying with new or revised accounting standards.

Recent Accounting Pronouncements

In February 2016, the Financial Accounting Standards Board, or FASB, issued Accounting Standards Update, or ASU, No. 2016-02, Leases (Topic 842) (ASC 842), which establishes a comprehensive new lease accounting model. The new standard: (a) clarifies the definition of a lease; (b) requires a dual approach to lease classification similar to current lease classifications; and (c) causes lessees to recognize leases on the balance sheet as a lease liability with a corresponding right-of-use asset for leases with a lease-term of more than twelve months. The new standard is effective for fiscal years and interim periods beginning after December 15, 2018, with early adoption permitted. A modified retrospective transition approach is required for leases existing at, or entered into after, the beginning of the earliest comparative period presented in the financial statements, including a number of optional practical expedients that entities may elect to apply. In July 2018, the FASB issued ASU No. 2018-11, Leases (Topic 842): Targeted Improvements, an update which provides another transition method, the prospective transition method, which allows entities to initially apply the new lease standard at the adoption date and recognize a cumulative-effect adjustment to the opening balance of retained earnings in the period of adoption. We will adopt the new standard on January 1, 2019 using the prospective transition method. In preparation for adoption of the standard, we engaged a third-party service provider to assist us with the evaluation.

We have identified all leases and reviewed the leases to determine the impact of ASC 842 on our consolidated financial statements. We have elected to apply all of the practical expedients as a package, which include not reassessing (1) whether any expired or existing contracts are or contain leases, (2) lease classification for any expired or existing leases, and (3) initial direct costs for any existing leases. Based on our assessment, we have concluded that the adoption of the new standard will result in the recording of a right-of-use asset and a lease liability on the consolidated balance sheet on January 1, 2019. While substantially complete, we are still in the process of finalizing our evaluation of the effect of ASC 842 on our financial statements and disclosures. We do not expect the adoption of ASU 2016-02, as amended, to have a material impact on our consolidated statements of operations or consolidated statements of cash flows.

In June 2016, the FASB issued ASU No. 2016-13, Financial Instruments—Credit Losses (Topic 326). The standard changes how entities will measure credit losses for most financial assets and certain other instruments that are not measured at fair value through net income. Financial assets measured at amortized cost will be presented at the net amount expected to be collected by using an allowance for credit losses. The standard is effective for fiscal years and interim periods beginning after December 15, 2019. Early adoption is permitted for all periods beginning after December 15, 2018. We have evaluated the impact of this guidance and have concluded that adoption of the standard will not have a material impact on our consolidated financial statements.

In February 2018, the FASB issued ASU No. 2018-02, Income Statement-Reporting Comprehensive Income (Topic 220). The standard update allows for a reclassification from accumulated other comprehensive income to retained earnings for stranded tax effects resulting from the Tax Act. Consequently, the ASU 2018-02 eliminates the stranded tax effects resulting from the Tax Act. The new standard is effective for fiscal years and interim periods beginning after December 15, 2018. Early adoption is permitted, including adoption in any interim period for reporting periods for which financial statements have not yet been issued. The new standard should be applied either in the period of adoption or retrospectively to each period (or periods) in which the effect of the change in the U.S. federal corporate income tax rate in the Tax Act is recognized. We have evaluated the impact of this guidance and have concluded that adoption of the standard will not have a material impact on our consolidated financial statements.

In June 2018, the FASB issued ASU No. 2018-07 – Compensation-Stock Compensation (Topic 718): Improvements to Nonemployee Shared-Based Payment Accounting. The standard update expands the scope of Topic 718 to include share-based payment transactions for acquiring goods and services from nonemployees. The new standard is effective for fiscal years and interim periods beginning after December 15, 2018. Early adoption is permitted, but no earlier than an entity's adoption date of Topic 606. We have evaluated the impact of this guidance and have concluded that adoption of the standard will not have a material impact on our consolidated financial statements.

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. The standard eliminates certain disclosure requirements for fair value measurements for all entities, requires public entities to disclose certain new information, and modifies some disclosure requirements. The new standard is effective for fiscal years and interim periods beginning after December 15, 2019. Early adoption is permitted upon issuance of this ASU. Entities making this election to early adopt are permitted to early adopt the eliminated or modified disclosure requirements and delay the adoption of the new disclosure requirements until their effective date. We are currently evaluating the impact that the standard will have on our consolidated financial statements.

In August 2018, the SEC adopted the final rule under SEC Release No. 33-10532, "*Disclosure Update and Simplification*," amending certain disclosure requirements that were redundant, duplicative, overlapping, outdated or superseded. In addition, the amendments expanded the disclosure requirements on the analysis of stockholders' equity for interim financial statements. Under the amendments, an analysis of changes in each caption of stockholders' equity presented in the balance sheet must be provided in a note or separate statement. The analysis should present a reconciliation of the beginning balance to the ending balance of each period for which a statement of comprehensive income is required to be filed. This final rule became effective on November 5, 2018 and we anticipate our first presentation of changes in stockholders' equity will be included in our Form 10-Q for the quarter ended March 31, 2019.

Recently Adopted Accounting Pronouncements

On January 1, 2018, we adopted ASU, No. 2014-09, Revenue from Contracts with Customers (Topic 606) using the modified retrospective method. The adoption of this standard had a material impact on our consolidated financial statements. Refer to Note 2 – Basis of Presentation, Use of Estimates and Recently Adopted Accounting Pronouncements in the Notes to Consolidated Financial Statements (Part II, Item 8 of this Annual Report on Form 10-K) for further discussion.

In January 2016, the FASB issued ASU No. 2016-01, Financial Instruments--Overall (Subtopic 825-10): Recognition and Measurement of Financial Assets and Financial Liabilities, which amends the guidance in U.S. GAAP on the classification and measurement of financial instruments. In February 2018, the FASB issued ASU No. 2018-03 which provides additional clarification and implementation guidance on the previously issued ASU No. 2016-01. Changes to the current guidance primarily affect the accounting for equity investments, financial liabilities under the fair value option, and the presentation and disclosure requirements for financial instruments. In addition, the ASU clarifies guidance related to the valuation allowance assessment when recognizing deferred tax assets resulting from unrealized losses on available-for-sale debt securities. The new standard is effective for fiscal years and interim periods beginning after December 15, 2017, and upon adoption, an entity should apply the amendments by means of a cumulative-effect adjustment to the balance sheet at the beginning of the first reporting period in which the guidance is effective. We adopted this standard on January 1, 2018 and the adoption of the standard did not have a material impact on our consolidated financial statements.

In August 2016, the FASB issued ASU No. 2016-15, Statement of Cash Flows (Topic 230): Classification of Certain Cash Receipts and Cash Payments. ASU 2016-15 identifies how certain cash receipts and cash payments are presented and classified in the Statement of Cash Flows. The standard is effective for fiscal years and interim periods beginning after December 15, 2017. The standard should be applied retrospectively and early adoption is permitted, including adoption in an interim period. We adopted this standard on January 1, 2018 and the adoption of the standard did not have a material impact on our consolidated statement of cash flows.

In November 2016, the FASB issued ASU No. 2016-18, Statement of Cash Flows (Topic 230): Restricted Cash. ASU 2016-18 requires that the statement of cash flows explains the change during the period in the total cash, cash equivalents, and restricted cash. The standard is effective for fiscal years beginning after December 15, 2017, and interim periods within those years. This standard should be applied retrospectively and early adoption is permitted, including adoption in an interim period. We adopted this standard on January 1, 2018 utilizing the required retrospective transition method and changed the presentation and classification of restricted cash in our consolidated statement of cash flows.

In May 2017, the FASB issued ASU No. 2017-09, Compensation – Stock Compensation (Topic 718): Scope of Modification Accounting. ASU 2017-09 provides clarity and reduces the complexity of applying the guidance in Topic 718, Compensation – Stock Compensation, to a change to the terms or conditions of a share-based payment award. This standard is effective for annual periods beginning after December 15, 2017. We adopted this standard on January 1, 2018, and the adoption of the standard did not have a material impact on our consolidated financial statements.

In March 2018, the FASB issued ASU No. 2018-05, Income Taxes (Topic 740): Amendments to SEC Paragraphs Pursuant to SEC Staff Accounting Bulletin No. 118, which included amendments to expand income tax accounting and disclosure guidance pursuant to SEC Staff Accounting Bulletin No. 118, or SAB 118, issued by the SEC in December 2017. SAB 118 provides guidance on accounting for the income tax effects of the Tax Reform Act. We adopted this ASU on January 1, 2018. Refer to Note 13 – Income Taxes in the Notes to Consolidated Financial Statements (Part II, Item 8 of this Annual Report on Form 10-K) for more information and disclosures related to this amended guidance.

In November 2018, the FASB issued ASU No. 2018-18, Collaborative Arrangements (Topic 808). The standard clarifies the interaction between Topic 808, Collaborative Arrangements, and Topic 606, Revenue from Contracts with Customers. The standard requires transactions in collaborative arrangements to be accounted for under Topic 606 if the counter-party is a customer for a good or service (or bundle of goods and services) that is a distinct unit of account. The standard also precludes entities from presenting consideration from transactions with a collaborator that is not a customer together with revenue recognized from contracts with customers. The standard is effective for fiscal years and interim periods beginning after December 15, 2019. Early adoption is permitted for entities that have already adopted Topic 606 or do so concurrently with the adoption of this standard. We early adopted this standard in the fourth quarter of 2018 and the adoption of the standard did not have an impact on our consolidated financial statements.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk.

The primary financial risk we are exposed to is foreign currency exchange, as certain operations, assets and liabilities are denominated in foreign currency. Foreign currency exposures arise from transactions denominated in a currency other than the functional currency and from foreign denominated revenue and profit translated into U.S. dollars. The primary foreign currency to which we are exposed is the Euro. We manage these risks through normal operating and financing activities and do not currently hedge our exposure to foreign currency exchange rate fluctuations.

Item 8. Financial Statements and Supplementary Data.

ADURO BIOTECH, INC.
INDEX TO CONSOLIDATED FINANCIAL STATEMENTS

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the stockholders and the Board of Directors of Aduro Biotech, Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Aduro Biotech, Inc. and subsidiaries (the "Company") as of December 31, 2018 and 2017, the related consolidated statements of operations, comprehensive loss, stockholders' equity, and cash flows, for each of the three years in the period ended December 31, 2018, and the related notes (collectively referred to as the "financial statements"). In our opinion, the financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2018 and 2017, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2018, in conformity with accounting principles generally accepted in the United States of America.

Matter of Emphasis

As discussed in Note 2 to the financial statements, the Company has changed its method of accounting for revenue recognition in 2018 due to the adoption of ASU No. 2014-09, Revenue from Contracts with Customers (Topic 606).

Basis for Opinion

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

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

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

/s/ Deloitte & Touche LLP
San Francisco, California

February 27, 2019

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

ADURO BIOTECH, INC.
Consolidated Balance Sheets
(In thousands, except share and per share amounts)

	December 31,	
	2018	2017
Assets		
Current assets:		
Cash and cash equivalents	$ 126,310	$ 157,614
Short-term marketable securities	140,129	168,489
Accounts receivable	12,037	989
Income tax receivable	—	17,495
Prepaid expenses and other current assets	4,500	5,544
Total current assets	282,976	350,131
Long-term marketable securities	11,434	23,614
Property and equipment, net	29,157	31,085
Goodwill	8,334	8,723
Intangible assets, net	25,135	31,107
Restricted cash	468	468
Total assets	$ 357,504	$ 445,128
Liabilities and Stockholders' Equity		
Current liabilities:		
Accounts payable	$ 1,457	$ 1,150
Accrued clinical trial and manufacturing expenses	2,542	5,898
Accrued expenses and other liabilities	10,518	12,601
Contingent consideration	—	6,829
Deferred revenue	16,000	14,923
Total current liabilities	30,517	41,401
Deferred rent	11,063	9,991
Contingent consideration	998	759
Deferred revenue	172,671	148,148
Deferred tax liabilities	6,104	6,538
Other long-term liabilities	840	818
Total liabilities	222,193	207,655
Commitments and contingencies		
Stockholders' equity:		
Preferred stock, $0.0001 par value; 10,000,000 shares authorized at December 31, 2018 and 2017; and no shares issued and outstanding at December 31, 2018 and 2017	—	—
Common stock, $0.0001 par value; 300,000,000 shares authorized at December 31, 2018 and 2017; and 79,571,714 and 77,736,201 shares issued and outstanding at December 31, 2018 and 2017	8	8
Additional paid-in capital	538,895	519,435
Accumulated other comprehensive income	940	1,893
Accumulated deficit	(404,532)	(283,863)
Total stockholders' equity	135,311	237,473
Total liabilities and stockholders' equity	$ 357,504	$ 445,128

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

ADURO BIOTECH, INC.
Consolidated Statements of Operations
(In thousands, except share and per share amounts)

	Year Ended December 31,		
	2018	2017	2016
Revenue:			
Collaboration and license revenue	$ 15,087	$ 17,109	$ 50,593
Grant revenue	—	130	88
Total revenue	15,087	17,239	50,681
Operating expenses:			
Research and development	75,836	89,382	87,718
General and administrative	36,035	33,751	34,277
Loss on impairment of intangible assets	3,992	—	—
Amortization of intangible assets	584	559	549
Total operating expenses	116,447	123,692	122,544
Loss from operations	(101,360)	(106,453)	(71,863)
Interest income, net	5,284	3,444	2,219
Other expense, net	(64)	(218)	(40)
Loss before income tax	(96,140)	(103,227)	(69,684)
Income tax benefit (provision)	783	11,364	(21,464)
Net loss	$ (95,357)	$ (91,863)	$ (91,148)
Net loss per common share, basic and diluted	$ (1.21)	$ (1.26)	$ (1.40)
Shares used in computing net loss per common share, basic and diluted	78,812,407	72,901,215	65,200,762

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

ADURO BIOTECH, INC.
Consolidated Statements of Comprehensive Loss

	Year Ended December 31,		
	2018	2017	2016
Net loss	$ (95,357)	$ (91,863)	$ (91,148)
Other comprehensive (loss) income:			
Unrealized gain (loss) on marketable securities, net of tax of $0	121	(155)	40
Foreign currency translation adjustments, net of tax of $0	(1,074)	3,732	(1,385)
Comprehensive loss	$ (96,310)	$ (88,286)	$ (92,493)

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

ADURO BIOTECH, INC.
Consolidated Statements of Stockholders' Equity
(In thousands, except share amounts)

	Common Stock		Additional Paid-In Capital	Accumulated Other Comprehensive Income (Loss)	Accumulated Deficit	Total Stockholders' Equity
	Shares	Amount				
Balance at December 31, 2015	63,587,833	6	362,807	(339)	(100,852)	261,622
Issuance of common stock upon exercise of stock options	873,735	—	903	—	—	903
Issuance of common stock upon exercise of warrants	831,513	—	97	—	—	97
Issuance of common stock under Employee Stock Purchase Plan	98,936	—	835	—	—	835
Issuance of common stock upon at the market offering (Note 10)	2,526,229	1	36,805	—	—	36,806
Stock-based compensation	—	—	15,006	—	—	15,006
Excess tax benefit from stock-based compensation	—	—	4,444	—	—	4,444
Other comprehensive loss	—	—	—	(1,345)	—	(1,345)
Net loss	—	—	—	—	(91,148)	(91,148)
Balance at December 31, 2016	67,918,246	7	420,897	(1,684)	(192,000)	227,220
Issuance of common stock upon exercise of stock options	2,041,862	—	2,304	—	—	2,304
Issuance of common stock upon exercise of warrants	28,243	—	40	—	—	40
Issuance of common stock under Employee Stock Purchase Plan	103,562	—	828	—	—	828
Issuance of common stock upon at the market offering (Note 10)	7,494,438	1	78,990	—	—	78,991
Release of restricted stock units	149,850	—	—	—	—	—
Stock-based compensation	—	—	16,376	—	—	16,376
Other comprehensive income	—	—	—	3,577	—	3,577
Net loss	—	—	—	—	(91,863)	(91,863)
Balance at December 31, 2017	77,736,201	8	519,435	1,893	(283,863)	237,473
Issuance of common stock upon exercise of stock options	1,404,422	—	1,457	—	—	1,457
Issuance of common stock upon exercise of warrants	3,317	—	—	—	—	—
Issuance of common stock under Employee Stock Purchase Plan	111,321	—	529	—	—	529
Release of restricted stock units	316,453	—	—	—	—	—
Stock-based compensation	—	—	17,474	—	—	17,474
Other comprehensive loss	—	—	—	(953)	—	(953)
Cumulative effect of changes in accounting principles related to revenue recognition	—	—	—	—	(25,312)	(25,312)
Net loss	—	—	—	—	(95,357)	(95,357)
Balance at December 31, 2018	79,571,714	8	538,895	940	(404,532)	135,311

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

ADURO BIOTECH, INC.
Consolidated Statement of Cash Flows
(In thousands)

	Year Ended December 31,		
	2018	**2017**	**2016**
Cash Flows from Operating Activities			
Net loss	$ (95,357)	$ (91,863)	$ (91,148)
Adjustments to reconcile net loss to net cash provided by (used in) operating activities:			
Depreciation and amortization	4,369	3,426	2,003
Amortization of intangibles	584	559	549
Accretion of discounts and amortization of premiums on marketable securities	(1,067)	621	1,831
Stock-based compensation	17,474	16,376	15,006
Excess tax benefit from stock-based compensation	—	—	(4,444)
Loss from remeasurement of fair value of contingent consideration	635	2,824	400
Impairment of intangible assets	3,992	—	—
Loss on disposal of property and equipment	27	9	15
Deferred income tax	(146)	6,180	(7,800)
Changes in operating assets and liabilities:			
Payment of contingent consideration	(3,322)	—	—
Accounts receivable	(11,048)	149	3,708
Income tax receivable	17,495	(17,495)	—
Prepaid expenses and other assets	1,006	1,535	3,487
Accounts payable	533	(1,206)	(2,851)
Deferred revenue	288	(14,944)	(15,068)
Accrued clinical trial and manufacturing expenses	(3,300)	924	(745)
Accrued expenses and other liabilities	(922)	4,049	8,981
Net cash used in operating activities	(68,759)	(88,856)	(86,076)
Cash Flows from Investing Activities			
Purchase of marketable securities	(226,953)	(260,435)	(359,500)
Proceeds from maturities of marketable securities	268,684	354,530	351,322
Purchase of property and equipment	(2,365)	(5,154)	(23,887)
Proceeds from sale of property and equipment	41	—	—
Net cash provided by (used in) investing activities	39,407	88,941	(32,065)
Cash Flows from Financing Activities			
Payment of contingent consideration	(3,481)	—	—
Proceeds from issuance of common stock, net of offering costs	—	78,991	36,806
Excess tax benefit from stock-based compensation	—	—	4,444
Proceeds from exercise of stock options and warrants	1,457	2,235	1,000
Proceeds from employee stock purchase plan	529	828	835
Net cash (used in) provided by financing activities	(1,495)	82,054	43,085
Effect of exchange rate changes on cash	(457)	543	—
Net (decrease) increase in cash, cash equivalents, and restricted cash	(31,304)	82,682	(75,056)
Cash, cash equivalents, and restricted cash at beginning of period	158,082	75,400	150,456
Cash, cash equivalents, and restricted cash at end of period	$ 126,778	$ 158,082	$ 75,400
Supplemental Disclosure			
Cash paid for taxes	$ —	$ 1,106	$ 22,400
Supplemental Disclosure of Non-Cash Investing and Financing Activities			
Purchase of property and equipment in accounts payable and accrued liabilities	$ 331	$ 2,790	$ 447
Reconciliation of Cash, Cash Equivalents and Restricted Cash			
Cash and cash equivalents	$ 126,310	$ 157,614	$ 74,932
Restricted cash	468	468	468
Total cash, cash equivalents and restricted cash	$ 126,778	$ 158,082	$ 75,400

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

1. Organization and Nature of Business

Aduro Biotech, Inc., and its wholly owned subsidiaries, or the Company, is an immunotherapy company focused on the discovery, development and commercialization of therapies that are designed to harness the body's natural immune system for the treatment of patients with challenging diseases, including cancer. The Company is located in Berkeley, California and its wholly-owned subsidiary, Aduro Biotech Holdings, Europe B.V., or Aduro Biotech Europe, is based in the Netherlands. The Company operates in one business segment.

The Company believes its primary technologies related to the Stimulator of Interferon Genes (STING) and A Proliferation Inducing Ligand (APRIL) pathways have led to a strong pipeline of clinical candidates that are being investigated in cancer, autoimmune and inflammatory diseases. The Company's product candidates are designed to stimulate and/or regulate innate and adaptive immune responses, particularly in combination with other novel immunotherapies. The Company is collaborating with a number of leading global pharmaceutical companies to help expand and drive our product pipeline. The Company's strategy is to rapidly advance best-in-class therapies from its STING and APRIL technologies through clinical development and regulatory approval.

2. Basis of Presentation, Use of Estimates and Recent Accounting Pronouncements

Basis of Presentation

The consolidated financial statements have been prepared in accordance with U.S. generally accepted accounting principles, or U.S. GAAP, and include the accounts of Aduro Biotech, Inc. and its wholly owned subsidiaries. All intercompany transactions and balances have been eliminated.

Use of Estimates

The preparation of financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities, disclosure of contingent assets and liabilities and reported amounts of revenue and expenses in the financial statements and accompanying notes. On an ongoing basis, management evaluates its estimates, including those related to revenue recognition, clinical trial accruals, common stock and related warrants, income taxes and stock-based compensation. Management bases its estimates on historical experience and on various other market-specific and relevant assumptions that management believes to be reasonable under the circumstances. Actual results could differ from these estimates.

Revenue Recognition

The Company recognizes revenue when its customers obtain control of the promised goods or services, in an amount that reflects the consideration which the Company expects to receive in exchange for those goods or services.

Collaboration and license revenue

The Company's collaboration agreements may include the transfer of intellectual property rights in the form of licenses, obligations to provide research and development services and obligations to participate on certain development committees with the collaboration party. The terms of such agreements include payment to the Company of one or more of the following: nonrefundable upfront fees, payment for research and development services, development, regulatory and commercial milestone payments, and royalties on net sales of licensed products. The Company assesses whether the promises in these agreements are considered distinct performance obligations that should be accounted for separately. Judgment is required to determine whether the license to the Company's intellectual property is distinct from the research and development services or participation on development committees.

The transaction price in each agreement is allocated to the identified performance obligations based on the standalone selling price, or SSP, of each distinct performance obligation. Judgment is required to determine SSP. In instances where SSP is not directly observable, such as when a license or service is not sold separately, SSP is determined using information that may include market conditions and other observable inputs. Due to the early stage of the Company's licensed technology, the license of such technology is typically combined with the research and development services and committee participation as one performance obligation.

Revenue associated with nonrefundable upfront license fees where the license fees and research and development services cannot be accounted for as separate performance obligations is deferred and recognized as revenue over the expected period of performance using a cost-based input methodology. The Company utilizes judgment to assess the pattern of delivery of the performance obligation.

At the inception of each agreement that includes development, regulatory or commercial milestone payments, the Company evaluates whether the milestones are considered probable of being reached and estimates the amount to be included in the transaction price by using the most likely amount method. If it is probable that a significant reversal of cumulative revenue would not occur, the associated milestone value is included in the transaction price. Milestone payments that are not within the control of the Company or the licensee, such as regulatory approvals, are not considered probable of being achieved until those approvals are received or the underlying activity has been completed. The transaction price is then allocated to each performance obligation in the agreement based on relative SSP. At the end of each subsequent reporting period, the Company re-evaluates the probability of achievement of each such milestone 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 revenues and earnings in the period of adjustment.

Cash and Cash Equivalents

Cash and cash equivalents include all cash balances and highly liquid investments with original maturities of three months or less from the date of purchase. At December 31, 2018 and 2017, cash and cash equivalents consisted of cash in bank deposits, money market funds held at financial institutions, commercial paper and U.S. government and agency securities. The recorded carrying amount of cash equivalents approximates their fair value.

Concentration of Credit Risk

Financial instruments that potentially subject the Company to concentration of credit risk consist of cash and cash equivalents and accounts receivable. Cash and cash equivalents are held at financial institutions in the United States and in the Netherlands. The Company is exposed to credit risk in the event of default by the financial institution to the extent that cash and cash equivalent balances recorded in the balance sheets are in excess of the amounts that are insured by the Federal Deposit Insurance Corporation. The Company has not experienced any losses on its deposits since inception, and management believes that minimal credit risk exists with respect to these financial institutions.

Accounts receivable consist of amounts due from various collaboration agreements and subtenants. The Company’s management believes these receivables are fully collectible.

Property and Equipment

Property and equipment is carried at cost less accumulated depreciation and amortization. Depreciation and amortization of property and equipment is calculated using the straight-line method. When assets are retired or otherwise disposed of, the cost and accumulated depreciation are removed from the balance sheet and any resulting gain or loss is reflected in operations in the period realized.

The useful lives of the property and equipment are as follows:

Lab equipment	5 years
Furniture and fixtures	5 years
Computer and office equipment	3 – 5 years
Leasehold improvements	Shorter of remaining lease term or estimated useful life

Expenditures for repairs and maintenance, which do not improve or extend the life of the assets, are expensed as incurred.

Business Combinations

The Company accounts for acquisitions using the acquisition method of accounting which requires the recognition of tangible and identifiable intangible assets acquired and liabilities assumed at their estimated fair values as of the business combination date. The Company allocates any excess purchase price over the estimated fair value assigned to the net tangible and identifiable intangible assets acquired and liabilities assumed to goodwill. Contingent consideration is included within the acquisition cost and is recognized at its fair value on the acquisition date. A liability resulting from contingent consideration is remeasured to fair value at each reporting date until the contingency is resolved and changes in fair value are recognized in earnings. Transaction costs are expensed as incurred in general and administrative expenses. Results of operations and cash flows of acquired companies are included in the Company's operating results from the date of acquisition.

Goodwill and Intangible Assets

Goodwill represents the excess of the consideration transferred over the estimated fair value of assets acquired and liabilities assumed in a business combination. Intangible assets with indefinite useful lives are related to acquired in-process research and development, or IPR&D, projects and are measured at their respective fair values as of the acquisition date. Goodwill and intangible assets with indefinite useful lives are not amortized but are tested for impairment on an annual basis or more frequently if the Company becomes aware of any events or changes that would indicate the fair values of the assets are below their carrying amounts. Intangible assets related to IPR&D projects are considered to be indefinite-lived until the completion or abandonment of the associated research and development efforts. If and when development is complete, which generally occurs if and when regulatory approval to market a product is obtained, the associated assets are deemed finite-lived and are amortized based on their respective estimated useful lives at that point in time. The Company recorded an impairment loss of $4.0 million related to IPR&D during the year ended December 31, 2018. No impairment of IPR&D has been recorded in prior years. The Company has not had an impairment of goodwill since inception.

Impairment of Long-Lived Assets

The Company reviews its long-lived assets, including property and equipment and definite-lived intangible assets, for impairment whenever events or changes in circumstances indicate the carrying amount of an asset may not be recoverable. Recoverability of assets held and used is measured by comparison of the carrying amount of an asset to the future undiscounted cash flows expected to be generated from the use of the asset and its eventual disposition. If such assets are considered to be impaired, the impairment to be recognized is measured by the amount by which the carrying amount exceeds the fair value of the impaired assets. Assets to be disposed of are reported at the lower of their carrying amount or fair value less cost to sell. The Company has not recorded an impairment of long-lived assets since inception.

Accrued Research and Development Costs

The Company records accrued liabilities for estimated costs of research and development activities conducted by third-party service providers, which include the conduct of preclinical studies and clinical trials and contract manufacturing activities. These costs are a significant component of the Company's research and development expenses. The Company accrues for these costs based on factors such as estimates of the work completed and in accordance with agreements established with its third-party service providers under the service agreements. The Company makes significant judgments and estimates in determining the accrued liabilities balance in each reporting period. As actual costs become known, the Company adjusts its accrued liabilities. The Company has not experienced any material differences between accrued costs and actual costs incurred. However, the status and timing of actual services performed, number of patients enrolled and the rate of patient enrollments may vary from the Company's estimates, resulting in adjustments to expense in future periods. Changes in these estimates that result in material changes to the Company's accruals could materially affect the Company's results of operations.

Research and Development Costs

Research and development costs are expensed as incurred. Research and development costs consist of salaries and benefits, lab supplies, contract and grant research costs, fees paid to consultants and third parties that conduct certain research and development activities on the Company's behalf and allocations of facilities-related costs. Nonrefundable advance payments for goods or services to be rendered in the future for use in research and development activities are deferred and capitalized as prepaid expenses until the related goods are delivered or the services are performed.

Stock-Based Compensation

The Company measures its stock-based awards made to employees based on the estimated fair values of the awards as of the grant date using the Black-Scholes option-pricing model. Stock-based compensation expense is recognized over the requisite service period using the straight-line method and is based on the value of the portion of stock-based payment awards that is ultimately expected to vest. As such, the Company's stock-based compensation is reduced for the estimated forfeitures and revised, if necessary, in subsequent periods if actual forfeitures differ from the original estimates.

Stock-based compensation expense for options granted to non-employees as consideration for services received is measured on the date of performance at the fair value of the consideration received or the fair value of the equity instruments issued, using the Black-Scholes option-pricing model, whichever can be more reliably measured. Stock-based compensation expense for options granted to non-employees is remeasured each period as the underlying options vest.

Income Taxes

The Company accounts for income taxes using the asset and liability method. Under this method, deferred income tax assets and liabilities are recorded based on the estimated future tax effects of differences between the financial reporting and the tax bases of assets and liabilities and are measured using the enacted tax rates and laws that will be in effect when the differences are expected to reverse. Deferred income taxes are classified as noncurrent. A valuation allowance is provided when it is more likely than not that some portion or all of a deferred tax asset will not be realized.

The tax effects of the Company's income tax positions are recognized only if determined "more likely than not" to be sustained based solely on the technical merits as of the reporting date. The Company considers many factors when evaluating and estimating its tax positions and tax benefits, which may require periodic adjustments and which may not accurately anticipate actual outcomes.

Foreign Currency Translation

The impact of changes in foreign currency exchange rates resulting from the translation of foreign currency financial statements into U.S. dollars for financial reporting purposes is included in other comprehensive loss. Assets and liabilities are translated into U.S. dollars at exchange rates in effect at the balance sheet date. Income and expense items are translated at average rates for the period.

Foreign currency transaction gains and losses are recorded as they are realized.

Recent Accounting Pronouncements

In February 2016, the Financial Accounting Standards Board, or FASB, issued Accounting Standards Update, or ASU, No. 2016-02, Leases (Topic 842) (ASC 842), which establishes a comprehensive new lease accounting model. The new standard: (a) clarifies the definition of a lease; (b) requires a dual approach to lease classification similar to current lease classifications; and (c) causes lessees to recognize leases on the balance sheet as a lease liability with a corresponding right-of-use asset for leases with a lease-term of more than twelve months. The new standard is effective for fiscal years and interim periods beginning after December 15, 2018, with early adoption permitted. A modified retrospective transition approach is required for leases existing at, or entered into after, the beginning of the earliest comparative period presented in the financial statements, including a number of optional practical expedients that entities may elect to apply. In July 2018, the FASB issued ASU No. 2018-11, Leases (Topic 842): Targeted Improvements, an update which provides another transition method, the prospective transition method, which allows entities to initially apply the new lease standard at the adoption date and recognize a cumulative-effect adjustment to the opening balance of retained earnings in the period of adoption. The Company will adopt the new standard on January 1, 2019 using the prospective transition method. In preparation for adoption of the standard, the Company engaged a third-party service provider to assist it with the evaluation.

The Company has identified all leases and reviewed the leases to determine the impact of ASC 842 on its consolidated financial statements. The Company has elected to apply all of the practical expedients as a package, which include not reassessing (1) whether any expired or existing contracts are or contain leases, (2) lease classification for any expired or existing leases, and (3) initial direct costs for any existing leases. Based on the Company's assessment, the Company has concluded that the adoption of the new standard will result in the recording of a right-of-use asset and a lease liability on the consolidated balance sheet on January 1, 2019. While substantially complete, the Company is still in the process of finalizing its evaluation of the effect of ASC 842 on its financial statements and disclosures. The Company does not expect the adoption of ASU 2016-02, as amended, to have a material impact on its consolidated statements of operations or consolidated statements of cash flows.

In June 2016, the FASB issued ASU No. 2016-13, Financial Instruments—Credit Losses (Topic 326). The standard changes how entities will measure credit losses for most financial assets and certain other instruments that are not measured at fair value through net income. Financial assets measured at amortized cost will be presented at the net amount expected to be collected by using an allowance for credit losses. The standard is effective for fiscal years and interim periods beginning after December 15, 2019. Early adoption is permitted for all periods beginning after December 15, 2018. The Company has evaluated the impact of this guidance and has concluded that adoption of the standard will not have a material impact on its consolidated financial statements.

In February 2018, the FASB issued ASU No. 2018-02, Income Statement-Reporting Comprehensive Income (Topic 220). The standard update allows for a reclassification from accumulated other comprehensive income to retained earnings for stranded tax effects resulting from the Tax Cuts and Jobs Act. Consequently, the ASU 2018-02 eliminates the stranded tax effects resulting from the Tax Cuts and Jobs Act. The new standard is effective for fiscal years and interim periods beginning after December 15, 2018. Early adoption is permitted, including adoption in any interim period for reporting periods for which financial statements have not yet been issued. The new standard should be applied either in the period of adoption or retrospectively to each period (or periods) in which the effect of the change in the U.S. federal corporate income tax rate in the Tax Cuts and Jobs Act is recognized. The Company has evaluated the impact of this guidance and has concluded that adoption of the standard will not have a material impact on its consolidated financial statements.

In June 2018, the FASB issued ASU No. 2018-07 – Compensation-Stock Compensation (Topic 718): Improvements to Nonemployee Shared-Based Payment Accounting. The standard update expands the scope of Topic 718 to include share-based payment transactions for acquiring goods and services from nonemployees. The new standard is effective for fiscal years and interim periods beginning after December 15, 2018. Early adoption is permitted, but no earlier than an entity's adoption date of Topic 606. The Company has evaluated the impact of this guidance and has concluded that adoption of the standard will not have a material impact on its consolidated financial statements.

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. The standard eliminates certain disclosure requirements for fair value measurements for all entities, requires public entities to disclose certain new information, and modifies some disclosure requirements. The new standard is effective for fiscal years and interim periods beginning after December 15, 2019. Early adoption is permitted upon issuance of this ASU. Entities making this election to early adopt are permitted to early adopt the eliminated or modified disclosure requirements and delay the adoption of the new disclosure requirements until their effective date. The Company is currently evaluating the impact that the standard will have on its consolidated financial statements.

In August 2018, the SEC adopted the final rule under SEC Release No. 33-10532, "*Disclosure Update and Simplification*," amending certain disclosure requirements that were redundant, duplicative, overlapping, outdated or superseded. In addition, the amendments expanded the disclosure requirements on the analysis of stockholders' equity for interim financial statements. Under the amendments, an analysis of changes in each caption of stockholders' equity presented in the balance sheet must be provided in a note or separate statement. The analysis should present a reconciliation of the beginning balance to the ending balance of each period for which a statement of comprehensive income is required to be filed. This final rule became effective on November 5, 2018 and the Company anticipates its first presentation of changes in stockholders' equity will be included in its Form 10-Q for the quarter ended March 31, 2019.

Recently Adopted Accounting Pronouncements

In May 2014, the FASB issued ASU No. 2014-09, Revenue from Contracts with Customers (Topic 606). This ASU as well as its related amendments affect any entity that either enters into contracts with customers to transfer goods and services or enters into contracts for the transfer of nonfinancial assets. ASU 2014-09 replaced most existing revenue recognition guidance in U.S. GAAP when it became effective. The standard's core principle is that a company will recognize revenue when it transfers promised goods or services to customers in an amount that reflects the consideration to which it expects to be entitled in exchange for those goods or services. The Company adopted this standard on January 1, 2018 using the modified retrospective method. The Company recognized the cumulative effect of initially applying the new revenue standard as an adjustment to the opening balance of its accumulated deficit. The comparative information has not been restated and continues to be reported under the accounting standards in effect for those periods.

As a result, the Company changed its accounting policy for revenue recognition, and the details of the significant changes and quantitative impact of the changes are disclosed below.

Milestone payments – under the milestone method ASC 605-28, payments that were contingent upon the achievement of a substantive milestone were recognized entirely as revenue in the period in which the milestone was achieved. To the extent that non-substantive milestones were achieved and the Company had remaining performance obligations, milestones were deferred and recognized as revenue over the estimated remaining period of performance. If there were no remaining performance obligations, the revenue from non-substantive milestones was recognized in the period it was earned. The milestone method no longer exists under the new revenue standard. The revenue from the milestone payments must be estimated using either the expected value method or the most likely amount method. Revenue that is not probable of significant reversal of cumulative revenue is included in the transaction price. Therefore, substantive milestones that were recognized when achieved under the legacy revenue guidance will be recognized as revenue over the performance period under the new standard with a cumulative catch-up recorded for the portion associated with the performance to date.

Pattern of revenue recognition – the Company recognized revenue from performance obligations delivered over time, such as licenses combined with research and development services and participation on development committees, on a straight-line basis over the period of performance under the legacy revenue guidance. The new standard allows entities to use either an input method or an output method to measure progress toward complete satisfaction of a performance obligation. For contracts in progress at the adoption date of the new standard the Company determined that the input method of measuring costs incurred to date compared to total estimated costs to be incurred under the contract most accurately depicts its performance.

The change in the pattern of revenue recognition upon adoption of Topic 606 for milestone payments and performance obligations delivered over time resulted in an increase in the balance of deferred revenue and an increase in the accumulated deficit balance of $25.3 million on January 1, 2018.

The following table summarizes the impact of adopting Topic 606 on select condensed consolidated balance sheet line items (in thousands):

	December 31, 2018		
	As reported	Adjustments	Balances without the adoption of Topic 606
		(in thousands)	
Liabilities			
Deferred revenue	$ 16,000	$ 2,815	$ 18,815
Deferred revenue – noncurrent	172,671	(31,338)	141,333
Stockholders' Equity			
Accumulated deficit	(404,532)	28,523	(376,009)

The following table summarizes the impact of adopting Topic 606 on select condensed consolidated statement of operations line items (in thousands, except per share data):

	Year Ended December 31, 2018		
	As reported	Adjustments	Balances without the adoption of Topic 606
		(in thousands)	
Collaboration and license revenue	$ 15,087	$ 3,211	$ 18,298
Total revenue	15,087	3,211	18,298
Loss from operations	(101,360)	3,211	(98,149)
Net loss	(95,357)	3,211	(92,146)
Net loss per share, basic and diluted	(1.21)	0.04	(1.17)

The following table summarizes the impact of adopting Topic 606 on audited condensed consolidated statement of cash flows line items (in thousands):

	Year Ended December 31, 2018		
	As reported	Adjustments	Balances without the adoption of Topic 606
		(in thousands)	
Cash flows from operating activities			
Net loss	$ (95,357)	$ 3,211	$ (92,146)
Changes in operating assets and liabilities:			
Deferred revenue	288	(3,211)	(2,923)

In January 2016, the FASB issued ASU No. 2016-01, Financial Instruments--Overall (Subtopic 825-10): Recognition and Measurement of Financial Assets and Financial Liabilities, which amends the guidance in U.S. GAAP on the classification and measurement of financial instruments. In February 2018, the FASB issued ASU No. 2018-03 which provides additional clarification and implementation guidance on the previously issued ASU No. 2016-01. Changes to the current guidance primarily affect the accounting for equity investments, financial liabilities under the fair value option, and the presentation and disclosure requirements for financial instruments. In addition, the ASU clarifies guidance related to the valuation allowance assessment when recognizing deferred tax assets resulting from unrealized losses on available-for-sale debt securities. The new standard is effective for fiscal years and interim periods beginning after December 15, 2017, and upon adoption, an entity should apply the amendments by means of a cumulative-effect adjustment to the balance sheet at the beginning of the first reporting period in which the guidance is effective. The Company adopted this standard on January 1, 2018, and the adoption of the standard did not have a material impact on its consolidated financial statements.

In August 2016, the FASB issued ASU No. 2016-15, Statement of Cash Flows (Topic 230): Classification of Certain Cash Receipts and Cash Payments. ASU 2016-15 identifies how certain cash receipts and cash payments are presented and classified in the Statement of Cash Flows. The standard is effective for fiscal years and interim periods beginning after December 15, 2017. The standard should be applied retrospectively and early adoption is permitted, including adoption in an interim period. The Company adopted this standard on January 1, 2018, and the adoption of the standard did not have a material impact on its consolidated statement of cash flows.

In November 2016, the FASB issued ASU No. 2016-18, Statement of Cash Flows (Topic 230): Restricted Cash. ASU 2016-18 requires that the statement of cash flows explains the change during the period in the total cash, cash equivalents, and restricted cash. The standard is effective for fiscal years beginning after December 15, 2017, and interim periods within those years. This standard should be applied retrospectively and early adoption is permitted, including adoption in an interim period. The Company adopted this standard on January 1, 2018 utilizing the required retrospective transition method and changed the presentation and classification of restricted cash in its consolidated statement of cash flows.

In May 2017, the FASB issued ASU No. 2017-09, Compensation – Stock Compensation (Topic 718): Scope of Modification Accounting. ASU 2017-09 provides clarity and reduces the complexity of applying the guidance in Topic 718, Compensation – Stock Compensation, to a change to the terms or conditions of a share-based payment award. This standard is effective for annual periods beginning after December 15, 2017. The Company adopted this standard on January 1, 2018, and the adoption of the standard did not have a material impact on its consolidated financial statements.

In March 2018, the FASB issued ASU No. 2018-05, Income Taxes (Topic 740): Amendments to SEC Paragraphs Pursuant to SEC Staff Accounting Bulletin No. 118, which included amendments to expand income tax accounting and disclosure guidance pursuant to SEC Staff Accounting Bulletin No. 118, or SAB 118, issued by the SEC in December 2017. SAB 118 provides guidance on accounting for the income tax effects of the Tax Reform Act. The Company adopted this standard on January 1, 2018. Refer to Note 12 for more information and disclosures related to this amended guidance.

In November 2018, the FASB issued ASU No. 2018-18, Collaborative Arrangements (Topic 808). The standard clarifies the interaction between Topic 808, Collaborative Arrangements, and Topic 606, Revenue from Contracts with Customers. The standard requires transactions in collaborative arrangements to be accounted for under Topic 606 if the counter-party is a customer for a good or service (or bundle of goods and services) that is a distinct unit of account. The standard also precludes entities from presenting consideration from transactions with a collaborator that is not a customer together with revenue recognized from contracts with customers. The standard is effective for fiscal years and interim periods beginning after December 15, 2019. Early adoption is permitted for entities that have already adopted Topic 606 or do so concurrently with the adoption of this standard. The Company early adopted this standard in the fourth quarter of 2018 and the adoption of the standard did not have an impact on its consolidated financial statements.

3. Fair Value Measurements

The carrying amounts of certain of the Company's financial instruments, including cash equivalents, accounts receivable and accounts payable approximate their fair values due to their short maturities. Assets and liabilities recorded at fair value on a recurring basis in the balance sheets, as well as assets and liabilities measured at fair value on a non-recurring basis or disclosed at fair value, are categorized based upon the level of judgment associated with inputs used to measure their fair values. The accounting guidance for fair value provides a framework for measuring fair value, and requires certain disclosures about how fair value is determined. Fair value is defined as the price that would be received upon the sale of an asset or paid to transfer a liability (an exit price) in an orderly transaction between market participants at the reporting date. The accounting guidance also establishes a three-level valuation hierarchy that prioritizes the inputs to valuation techniques used to measure fair value based upon whether such inputs are observable or unobservable. Observable inputs reflect market data obtained from independent sources, while unobservable inputs reflect market assumptions made by the reporting entity. The three-level hierarchy for the inputs to valuation techniques is briefly summarized as follows:

Level 1—Inputs are unadjusted, quoted prices in active markets for identical assets or liabilities at the measurement date;

Level 2—Inputs are observable, unadjusted quoted prices in active markets for similar assets or liabilities, unadjusted quoted prices for identical or similar assets or liabilities in markets that are not active, or other inputs that are observable or can be corroborated by observable market data for substantially the full term of the related assets or liabilities; and

Level 3—Unobservable inputs that are significant to the measurement of the fair value of the assets or liabilities that are supported by little or no market data.

The Company's cash equivalents, which include money market funds, are classified as Level 1 because they are valued using quoted market prices. The Company's marketable securities consist of available-for-sale securities and are generally classified as Level 2 because their value is based on valuations using significant inputs derived from or corroborated by observable market data.

In certain cases where there is limited activity or less transparency around the inputs to valuation, securities are classified as Level 3. Level 3 liabilities consist of contingent consideration liability.

The following table sets forth the Company's financial instruments that were measured at fair value on a recurring basis by level within the fair value hierarchy (in thousands):

	December 31, 2018			
	Level 1	Level 2	Level 3	Total
Financial Assets:				
Money market funds	$ 22,082	$ —	$ —	$ 22,082
U.S. government and agency securities	—	59,001	—	59,001
Corporate debt securities	—	70,964	—	70,964
Commercial paper	—	89,702	—	89,702
Total	$ 22,082	$ 219,667	$ —	$ 241,749
Financial Liabilities:				
Contingent consideration related to acquisition	$ —	$ —	$ 998	$ 998
Total	$ —	$ —	$ 998	$ 998

	December 31, 2017			
	Level 1	Level 2	Level 3	Total
Financial Assets:				
Money market funds	$ 86,461	$ —	$ —	$ 86,461
U.S. government and agency securities	—	108,076	—	108,076
Corporate debt securities	—	58,496	—	58,496
Commercial paper	—	74,011	—	74,011
Total	$ 86,461	$ 240,583	$ —	$ 327,044
Financial Liabilities:				
Contingent consideration related to acquisition	$ —	$ —	$ 7,588	$ 7,588
Total	$ —	$ —	$ 7,588	$ 7,588

The acquisition-date fair value of the contingent consideration liability represents the future consideration that is contingent upon the achievement of specified development milestones for a product candidate. The fair value of the contingent consideration is based on the Company's probability-weighted discounted cash flow assessment that considers probability and timing of future payments. The fair value measurement is based on significant Level 3 inputs such as anticipated timelines and probability of achieving development milestones. Changes in the fair value of the liability for contingent consideration, except for the impact of foreign currency, will be recognized in the consolidated statement of operations until settlement.

In the third quarter of 2018, the Company received regulatory authorization to conduct clinical studies for a specified antibody product candidate, which triggered payment of contingent consideration. A total of $6.8 million was paid to the former shareholders of BioNovion Holding B.V. under the terms of the 2015 share sale agreement pursuant to which the Company acquired BioNovion.

The Company did not have any financial assets and liabilities measured at fair value on a non-recurring basis as of December 31, 2018 and 2017. During the years ended December 31, 2018 and 2017, there were no transfers between the fair value measurement category levels.

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

	Contingent Consideration
Balance at December 31, 2016	$ 4,032
Net increase in fair value upon revaluation	2,824
Foreign currency impact	732
Balance at December 31, 2017	7,588
Net increase in fair value upon revaluation	635
Payment of contingent consideration	(6,803)
Foreign currency impact	(422)
Balance at December 31, 2018	$ 998

The following tables summarize the estimated value of the Company's cash equivalents and marketable securities and the gross unrealized holding gains and losses (in thousands):

	December 31, 2018			
	Amortized cost	Unrealized gains	Unrealized losses	Estimated Fair Value
Cash and cash equivalents:				
Cash	$ 36,124	$ —	$ —	$ 36,124
Money market funds	22,082	—	—	22,082
Commercial paper	62,413	—	—	62,413
Corporate debt securities	5,694	—	(3)	5,691
Total cash and cash equivalents	$ 126,313	$ —	$ (3)	$ 126,310
Marketable securities:				
U.S. government and agency securities	$ 59,127	$ 16	$ (142)	$ 59,001
Corporate debt securities	65,319	3	(49)	65,273
Commercial paper	27,289	—	—	27,289
Total marketable securities	$ 151,735	$ 19	$ (191)	$ 151,563

	December 31, 2017			
	Amortized cost	Unrealized gains	Unrealized losses	Estimated Fair Value
Cash and cash equivalents:				
Cash	$ 22,673	$ —	$ —	$ 22,673
Money market funds	86,461	—	—	86,461
Commercial paper	48,480	—	—	48,480
Total cash and cash equivalents	$ 157,614	$ —	$ —	$ 157,614
Marketable securities:				
U.S. government and agency securities	$ 108,317	$ —	$ (241)	$ 108,076
Corporate debt securities	58,551	1	(56)	58,496
Commercial paper	25,531	—	—	25,531
Total marketable securities	$ 192,399	$ 1	$ (297)	$ 192,103

The amortized cost and estimated fair value of the Company's available-for-sale marketable securities by contractual maturity are summarized below as of December 31, 2018 (in thousands):

	Amortized cost	Unrealized gains	Unrealized losses	Estimated Fair Value
Mature in one year or less	$ 140,316	$ 3	$ (190)	$ 140,129
Mature after one year through two years	11,419	16	(1)	$ 11,434
Total available-for-sale marketable securities	$ 151,735	$ 19	$ (191)	$ 151,563

4. Balance Sheet Components

Property and Equipment, Net

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

	December 31,	
	2018	2017
Leasehold improvements	$ 26,961	$ 27,102
Lab equipment	8,281	7,243
Computer and office equipment	2,292	2,016
Furniture and fixtures	1,560	1,767
Construction in progress	1,458	54
Total property and equipment	40,552	38,182
Less: accumulated depreciation	(11,395)	(7,097)
Property and equipment, net	$ 29,157	$ 31,085

Depreciation expense for the years ended December 31, 2018, 2017 and 2016 was $4.4 million, $3.4 million, and $2.0 million, respectively.

Accrued Expenses and Other Liabilities

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

	December 31,	
	2018	2017
Compensation and related benefits	$ 4,619	$ 5,320
Professional and consulting services	2,185	1,586
Accrued research expense	1,859	1,763
Deferred rent	653	434
Accrued property and equipment	101	2,790
Other	1,101	708
Total accrued expenses and other liabilities	$ 10,518	$ 12,601

5. Goodwill and Intangible Assets

Goodwill

The gross carrying amount of goodwill was as follows (in thousands):

Balance at December 31, 2016	$ 7,658
Foreign currency translation adjustment	1,065
Balance at December 31, 2017	8,723
Foreign currency translation adjustment	(389)
Balance at December 31, 2018	$ 8,334

Intangible assets

The gross carrying amounts and net book value of intangible assets were as follows (in thousands):

	December 31, 2018			
	Gross Carrying Amount	Impairment (1)	Accumulated Amortization	Net Book Value
Intangible assets with finite lives:				
License agreement	$ 11,318	—	$ 1,792	$ 9,526
Total intangible assets with finite lives	11,318	—	1,792	9,526
Acquired IPR&D assets	19,626	4,017	—	15,609
Total intangible assets	$ 30,944	$ 4,017	$ 1,792	$ 25,135

	December 31, 2017		
	Gross Carrying Amount	Accumulated Amortization	Net Book Value
Intangible assets with finite lives:			
License agreement	$ 11,847	$ 1,283	$ 10,564
Total intangible assets with finite lives	11,847	1,283	10,564
Acquired IPR&D assets	20,543	—	20,543
Total intangible assets	$ 32,390	$ 1,283	$ 31,107

(1) The amount includes effects of foreign currency exchange rates.

Intangible assets are carried at cost less accumulated amortization and impairment. Amortization is over a period of 20 years and the amortization expense is recorded in operating expenses. The decrease in the gross carrying amount of intangible assets as of December 31, 2018 compared to December 31, 2017 was due to a writedown of $4.0 million driven by the Company's decision to discontinue one of its acquired early research programs resulting in impairment of the acquired IPR&D asset.

Amortization expense was $584,000, $559,000, and $549,000 for the years ended December 31, 2018, 2017, and 2016, respectively. Based on finite-lived intangible assets recorded as of December 31, 2018, the estimated future amortization expense for the next five years is as follows (in thousands):

Year Ending December 31,	Estimated Amortization Expense
2019	$ 566
2020	566
2021	566
2022	566
2023	566

6. Collaboration Agreements

Novartis Agreement

In March 2015, the Company entered into a collaboration and license agreement with Novartis Pharmaceuticals Corporation, or Novartis, pursuant to which the Company is collaborating worldwide with Novartis regarding the development and potential commercialization of product candidates containing an agonist of the molecular target known as STING in the field of oncology, including immuno-oncology and cancer vaccines. Under this agreement, or the Novartis Agreement, the Company granted Novartis a co-exclusive license to develop such products worldwide, an exclusive license to commercialize such products outside the United States and a non-exclusive license to support the Company in commercializing such products in the United States if it requests such support. The collaboration is guided by a joint steering committee with each party having final decision making authority regarding specified areas of development or commercialization.

Under the Novartis Agreement, the Company received an upfront payment of $200.0 million in April 2015. During the second quarter of 2016, the Company earned a $35.0 million development milestone upon initiation of a Phase 1 trial for the first STING product candidate, ADU-S100, and recognized the payment as revenue in the period. The Company is also eligible to receive up to an additional $215.0 million in development milestones and up to an additional $250.0 million in regulatory approval milestones.

The Company is responsible for 38% of the joint development costs worldwide and Novartis is responsible for the remaining 62% of the joint development costs worldwide.

The Company will also receive 50% of gross profits on sales of any products commercialized pursuant to this collaboration in the United States and 45% of gross profits for specified European countries and Japan. For each of these profit share countries, each party will be responsible for its respective commercial sharing percentage of all joint commercialization costs incurred in that country.

For all other countries where the Company is not sharing profits, Novartis will be responsible for all commercialization costs and will pay the Company a royalty in the mid-teens on all net sales of product sold by Novartis, its affiliates and sublicensees, with such percentage subject to reduction post patent and data exclusivity expiration and subject to reduction, capped at a specified percentage, for royalties payable to third party licensors. Novartis' royalty obligation will run on a country-by-country basis until the later of expiration of the last valid claim covering the product, expiration of data exclusivity for the product or 12 years after first commercial sale of the product in such country.

With respect to the United States, specified European countries and/or Japan, the Company may elect for such region to either reduce by 50% or to eliminate in full the Company's development and commercialization cost sharing obligation. If the Company elects to reduce its cost sharing percentage by 50% in any such region, then its profit share in such region will also be reduced by 50%. If the Company elects to eliminate its development cost sharing obligation, then such region will be removed from the profit share, and instead Novartis will owe the Company royalties on any net sales of product for such region, as described above.

For revenue recognition purposes, the Company determined that the duration of the contract begins on the effective date in March 2015 and ends upon receipt of regulatory approval, estimated to occur in 2028. The Company's performance period commenced in May 2015. The transaction price consists of the $200.0 million upfront fee, a $35.0 million milestone payment received in the second quarter of 2016 upon commencement of a Phase 1 study, and $1.3 million in reimbursement of research and development costs through December 31, 2018. The Company determined that the remaining potential milestone payments are probable of significant reversal of cumulative revenue as their achievement is highly dependent on the successful completion of Phase 1 studies. Therefore, these payments are not included in the transaction price. Any consideration related to sales-based royalties and profit-sharing payments will be recognized when the related sales occur as they were determined to relate predominantly to the license granted to Novartis and have been excluded from the transaction price. The transaction price of $236.3 million is allocated to one combined performance obligation. The Company will re-evaluate the transaction price in each reporting period and as uncertain events are resolved or other changes in circumstances occur.

The Company concluded that it will utilize a cost-based input method to measure its progress toward completion of its performance obligation and to calculate the corresponding amount of revenue to recognize each period. The Company believes this is the best measure of progress because other measures do not reflect how the Company transfers its performance obligation to Novartis. In applying the cost-based input method of revenue recognition, the Company uses actual clinical study enrollment figures as well as actual costs incurred relative to budgeted costs expected to be incurred for the combined performance obligation. These costs consist primarily of internal full-time equivalent effort and third-party contract costs relative to the level of patient enrollment in the study. Revenue will be recognized based on the level of costs incurred relative to the total budgeted costs for the performance obligations. A cost-based input method of revenue recognition requires management to make estimates of costs to complete the Company's performance obligation. In making such estimates, significant judgment is required to evaluate assumptions related to cost estimates. The cumulative effect of revisions to estimated costs to complete the Company's performance obligation will be recorded in the period in which changes are identified and amounts can be reasonably estimated. A significant change in these assumptions and estimates could have a material impact on the timing and amount of revenue recognized in future periods.

Cost-sharing payments from Novartis are included in the transaction price and subject to the cost-based input method to determine the amount to be recognized in license and collaboration revenue in the Company's consolidated statements of operations, while cost-sharing payments to Novartis are accounted for as research and development expenses in the Company's consolidated statements of operations.

If the Company recognizes revenue from the sale of any products commercialized pursuant to this collaboration in the United States, it will retain 50% of the gross profits from such sales, and will pay the remaining 50% of the gross profits to Novartis. The Company will receive from Novartis 45% of gross profits for specified European countries and Japan from the sale of any products commercialized pursuant to this collaboration in such countries. Profit sharing payments made to or received from Novartis will be aggregated by product by territory and reported as expenses or revenues, as applicable.

For the years ended December 31, 2018, 2017, and 2016, the Company recognized revenue from its collaboration with Novartis totaling $11.9 million, $14.9 million and $14.8 million, respectively. The remaining balance of the upfront fee of $176.7 million and $163.0 million is included in deferred revenue at December 31, 2018 and 2017, respectively.

Lilly Agreement

On December 18, 2018, the Company entered into a research collaboration and exclusive license agreement, or the Lilly Agreement, with Lilly for its cGAS-STING Pathway Inhibitor program for the research and development of novel immunotherapies for autoimmune and other inflammatory diseases. Pursuant to the Lilly Agreement, the Company granted an exclusive and worldwide license under certain intellectual property rights controlled by the Company to research, develop, manufacture and commercialize certain cGAS-STING products for the treatment of autoimmune and other inflammatory diseases. The license granted is sublicensable during a specified time period.

Under the terms of the Lilly Agreement, the Company received an upfront payment of $12.0 million in the first quarter of 2019. This upfront payment was recognized as deferred revenue in 2018 as the performance obligations under the Lilly Agreement did not commence until January 2019.

The Company will also be eligible for development and commercial milestones of up to approximately $620.0 million per product. Lilly is also obligated to pay the Company tiered royalty payments at percentages in the single to low-double digits based on annual net sales of the licensed products. Lilly must pay such royalties on a product-by-product and country-by-country basis until the latest to occur of (i) the expiration of the last-to-expire valid claim of certain patents, (ii) the expiration of the data exclusivity period in such country or (iii) a specified anniversary of the first commercial sale of such product in such country. The Company will be reimbursed for up to a certain amount of research funding spent during the research term. In addition, the Company has the option to co-fund the clinical development of each product in exchange for an increase in royalty payments and a reduction in certain milestone payments to the extent relevant to such co-funded product. Lilly will be responsible for all costs of global commercialization.

Merck License Agreement

In connection with the acquisition of Aduro Biotech Europe in October 2015, the Company became party to an agreement with Merck Sharp & Dohme Corp., or Merck. The agreement sets forth the parties' respective obligations for development, commercialization, regulatory and manufacturing and supply activities for antibody product candidates. The Company identified the following promises under the agreement: 1) the license, 2) the obligation to provide research activities and 3) the obligation to participate on a Joint Research Committee. The Company determined that the promises were not distinct which resulted in them being combined into one performance obligation. The Company completed its performance obligation under the agreement by the end of 2016.

The Company received a milestone payment of $2.0 million in 2017 for the initiation of a GLP toxicology study and $3.0 million in the first quarter of 2018 for the initiation of a Phase 1 trial for the anti-CD27 antibody. Both payments were recognized in revenue when received as the Company had no remaining performance obligation. The Company is eligible to receive future contingent payments, including up to $307.0 million in potential development milestone payments, and up to $135.0 million in commercial and net sales milestones for a product candidate. In addition, the Company is eligible to receive royalties in the mid-single digits to low teens based on net sales of the product. Future milestone payments and royalties will be recognized when earned as the Company has no remaining performance obligations under this agreement.

Janssen ADU-214, ADU-741 and GVAX Prostate Agreements

On September 25, 2018, the Company received written notices of termination from Janssen Biotech, Inc., or Janssen, for its Research and License Agreements pertaining to the Company's proprietary attenuated strains of Listeria for treatment of lung and prostate cancers. Specifically, Janssen delivered notice for the following agreements, or the Janssen Agreements: (i) the Research and License Agreement, dated as of October 13, 2014, as amended by the Amendment to Research and License Agreements, dated as of November 11, 2015, or the Amendment; (ii) the Research and License Agreement, dated as of May 27, 2014, as amended by the Amendment; and (iii) the GVAX Prostate License Agreement, dated as of May 27, 2014. The terminations were effective December 24, 2018.

Under the terms of the Janssen Agreements, the Company granted Janssen an exclusive, worldwide license to research, develop, manufacture, use, sell and otherwise exploit products containing ADU-214, ADU-741 and GVAX Prostate for any and all uses. The Company also granted Janssen exclusive rights to develop products utilizing our proprietary attenuated strains of Listeria for treatment of lung and prostate cancers. The Company previously received upfront license fees of $42.5 million and milestone payments of $31.0 million upon completion of various development activities and were eligible to receive future contingent payments based on development, regulatory and commercial milestones as well as royalties on any net sales of licensed products by Janssen under each of the Janssen Agreements. Pursuant to the terms of the Janssen Agreements, upon Janssen's termination, the Company regained worldwide rights for the development and commercialization of products containing ADU-214, ADU-741 and GVAX Prostate for any and all uses. In addition, Janssen will have certain obligations as set forth in the Janssen Agreements, including (i) immediately ceasing its use of any of the Company's intellectual property and (ii) promptly returning or destroying any materials related to the development or manufacturing of the products containing ADU-214, ADU-741 and GVAX Prostate.

7. Research and Development and License Agreements

For the years ended December 31, 2018, 2017 and 2016, respectively, the Company recorded $800,000, $800,000 and $8.1 million in upfront payments, milestone payments and sublicensing fees from its research and development and license agreements described below.

STING Pathway License Agreements

Karagen Agreement

In June 2012, the Company entered into a license agreement with Karagen Pharmaceuticals, Inc., or Karagen, pursuant to which Karagen granted the Company an exclusive, worldwide, sublicenseable license under certain patents and know-how related to STING Activators to make, develop, use and commercialize products for use in the therapeutic and/or prophylactic treatment of cancer or precancerous conditions and a non-exclusive license to such patents and know-how to make, develop, use, and commercialize products in all other fields of use. Under the agreement, or the Karagen Agreement, the Company was also granted an option to designate a particular disease or condition to be added to the field of use under its exclusive license. Under the Karagen Agreement, the Company is obligated to use commercially reasonable efforts to develop and commercialize licensed products in the United States and the European Union.

Under the Karagen Agreement, the Company is required to make milestone payments up to $900,000, in aggregate, upon its achievement of specified development and regulatory milestones as well as royalty payments based on net sales of products by the Company and by its affiliates and sublicensees at rates ranging in the low single-digit percentages, determined by whether the disease field is an exclusive or non-exclusive disease field, subject to minimum annual royalties and standard reductions. In addition, the Company is required to pay Karagen a percentage of consideration received from any sublicensing arrangements ranging from the mid-single digits to the mid-teen digits, determined by the current stage of development of the relevant licensed product at the time of the sublicense grant, or by whether the Company has exercised its option to add a designated field of use to its exclusive license, as applicable.

The Karagen Agreement will expire, on a country-by-country basis, upon the expiration of the last-to- expire valid claim within the licensed patent rights. Either party may terminate the Karagen Agreement upon 90 days' advance written notice in the event of the other party's material breach that is not cured within such 90-day period, and immediately upon notice in the event of the other party's bankruptcy or insolvency. Additionally, the Company may terminate the Karagen Agreement at will upon 90 days' advance written notice to Karagen.

UCB Vance Agreement

In September 2014, the Company entered into a license agreement with University of California on behalf of its Berkeley campus, or UCB, granting the Company an exclusive, worldwide, sublicenseable license under certain patent rights covering the use of the STING Activator molecules that activate the STING receptor to make, develop, use and commercialize products, to practice methods and to offer services, in each case that are covered by the licensed patent rights, in all fields of use. Under this agreement, or the UCB Vance Agreement, the Company is obligated to use commercially reasonable efforts to develop, manufacture and sell licensed products and services and are obligated to achieve specified development and regulatory milestones by specified dates.

Under the UCB Vance Agreement, the Company is required to make future milestone payments totaling up to $1.8 million upon achievement of certain development and regulatory milestones. Under the UCB Vance Agreement, the Company is also obligated to pay UCB royalties based on net sales of licensed products by the Company and its sublicensees at a rate in the low single-digit percentages, subject to minimum annual royalties and a percentage of certain of the Company's sublicensing revenues ranging from the low-single digits to the low thirties, determined by the current stage of development of the relevant licensed product at the time the sublicense is granted.

The UCB Vance Agreement will continue in effect until the expiration of the last-to-expire valid claim within the licensed patent rights. UCB may terminate the agreement upon 90 days' advance written notice in the event of the Company's material breach that is not cured within such 90 day period. The Company may terminate the agreement at will upon 90 days' advance written notice.

Memorial Sloan Kettering Cancer Center Agreement

In December 2014, the Company entered into a license agreement with Memorial Sloan Kettering Cancer Center, or MSK, The Rockefeller University, Rutgers, The University of New Jersey, and University of Bonn, collectively the Licensors, granting the Company an exclusive, worldwide, sublicensable license to certain patent rights related to STING Activators and a non-exclusive, worldwide, sublicensable license under specified know-how, in each case to develop, make, have made, use, have used, import, sell, and otherwise commercialize licensed products for use in therapeutic and/or prophylactic treatments in humans. Under this agreement, or the MSK Agreement, the Company is obligated to use commercially reasonable efforts to develop and commercialize a licensed product, including achieving specified development and regulatory milestones by specified dates. In May and October 2016, the parties amended the license to further expand its scope, which now covers all products covered by the licensed intellectual property.

Under the MSK Agreement, the Company paid MSK upfront fees of $50,000 in January 2015 and an additional $2.0 million in connection with the second amendment to the MSK Agreement in October 2016. Under the terms of the amended MSK Agreement the Company is required to pay MSK development and regulatory milestone payments totaling up to $875,000 for each licensed product and commercialization milestone payments totaling up to $4.5 million for each licensed product, subject to a cap of $4.5 million per licensed product. The Company is also required to pay MSK royalties based on net sales of licensed products by Aduro and its sublicensees at a rate ranging in the low single digits depending on whether the licensed product is covered by a valid claim of the licensed patents, subject to minimum annual royalties. The Company's royalty obligation to MSK continues on a country-by-country basis until the later of the expiration of the last patent right covering the licensed product in such country or 10 years from the first commercial sale in such country. The Company is also obligated to pay MSK a percentage of certain consideration received for the grant of sublicenses, ranging from ten to the mid-twenties.

The MSK Agreement will continue in effect until the expiration of the Company's royalty obligations. Either party may terminate the MSK Agreement upon the other party's uncured material breach that is not cured within 90 days after the breaching party receives notice of such breach. Additionally, the Licensors may terminate the MSK Agreement for our bankruptcy or insolvency or if the Company fails to pay any undisputed amounts owed under the agreement and does not cure such failure within 30 days after receiving notice of such failure.

8. Commitments and Contingencies

Leases

The Company moved into its corporate office and laboratory facility located in Berkeley, California in August 2016. The Company leases approximately 110,853 square feet pursuant to an office/laboratory lease that was entered into in September 2015, or the Heinz Lease. The Company began incurring rent expense when the landlord delivered possession of the facility to the Company in March 2016. The Heinz Lease has an initial term of approximately thirteen and a half years expiring on December 31, 2029. The Company has the right to further extend the Heinz Lease term for up to two renewal terms of five years each, provided that the rental rate would be subject to market adjustment at the beginning of each renewal term. The Company is subleasing approximately 30,885 square feet in its Heinz facilities under subleases that expire on or before December 31, 2020.

The Company continued to lease its former office and research and development facility comprised of 25,000 square feet in Berkeley, California, under a non-cancelable operating lease, or the Bancroft Lease, through December 31, 2018. The Company subleased the Bancroft facility in 2018. The term of the Bancroft Lease expired on December 31, 2018.

During 2016, the Company established a letter of credit with Bank of America Merrill Lynch as security for the Heinz Lease in the amount of $468,000. The letter of credit is collateralized by a certificate of deposit for $468,000 which has been included in restricted cash in the consolidated balance sheets as of December 31, 2018 and 2017.

The Company also leases a research and development facility in Oss, the Netherlands, for employees of Aduro Biotech Europe. The term of the Oss lease has been extended through December 2020, with a one-year renewal option. The Company believes that its existing facilities are adequate to meet its current needs, and that suitable additional alternative spaces will be available in the future on commercially reasonable terms.

Rent expense was $5.8 million, $5.3 million and $3.9 million for the years ended December 31, 2018, 2017 and 2016, respectively. Under the terms of the lease agreements, the Company is also responsible for certain insurance, property tax and maintenance expenses. Future minimum payments under the leases at December 31, 2018 are as follows (in thousands):

Year ending December 31,	Amounts
2019	$ 5,519
2020	5,669
2021	5,332
2022	5,460
2023	5,570
Thereafter	35,836
Total	$ 63,386

Indemnifications

In the ordinary course of business, the Company enters into agreements that may include indemnification provisions. Pursuant to such agreements, the Company may indemnify, hold harmless and defend an indemnified party for losses suffered or incurred by the indemnified party. Some of the provisions will limit losses to those arising from third party actions. In some cases, the indemnification will continue after the termination of the agreement. The maximum potential amount of future payments the Company could be required to make under these provisions is not determinable. The Company has never incurred material costs to defend lawsuits or settle claims related to these indemnification provisions. The Company has also entered into indemnification agreements with its directors and officers that may require the Company to indemnify its directors and officers against liabilities that may arise by reason of their status or service as directors or officers to the fullest extent permitted by Delaware corporate law. The Company currently has directors' and officers' insurance.

Legal

The Company is not party to any material legal proceedings at this time. From time to time, the Company may become involved in various legal proceedings that arise in the ordinary course of its business.

Other Commitments

The Company has various manufacturing, clinical, research and other contracts with vendors in the conduct of the normal course of its business. All contracts are terminable, with varying provisions regarding termination. If a contract with a specific vendor were to be terminated, the Company would only be obligated for the products or services that the Company had received at the time the termination became effective as well as non-cancelable and non-refundable obligations, including payment obligations for costs or expenses incurred by the vendor for products or services before the termination became effective. In the case of terminating a clinical trial agreement at a particular site, the Company would also be obligated to provide continued support for appropriate medical procedures at that site until completion or termination.

9. Common Stock

The Company had reserved shares of common stock for future issuance as follows:

	December 31, 2018
Options issued and outstanding	8,986,010
Shares available for future stock option grants	7,255,050
Restricted stock units	1,600,218
Common stock warrants	64,909
Total	17,906,187

At-the-Market Sales Agreement

In May 2016, the Company entered into an "at-the-market" sales agreement, or the 2016 Sales Agreement, with Cowen and Company, LLC, or Cowen, for the offer and sale of shares of its common stock having an aggregate offering of up to $100.0 million from time to time through Cowen, acting as the Company's sales agent. The issuance and sale of these shares by the Company pursuant to the 2016 Sales Agreement were deemed an "at-the-market" offering under the Securities Act of 1933, as amended. Under the 2016 Sales Agreement, the Company agreed to pay Cowen a commission of up to 3% of the gross proceeds of any sales made pursuant to the Sales Agreement. During the year ended December 31, 2017, the Company received net proceeds of $60.5 million after deducting commissions and expenses payable by the Company, from the sale of 5,823,789 shares of common stock pursuant to the 2016 Sales Agreement. Since the inception of the 2016 Sales Agreement through December 31, 2017, the Company sold a total of 8,350,018 shares and received net total proceeds of $97.3 million. As of December 31, 2017, there were no amounts remaining for future sales under the 2016 Sales Agreement.

In August 2017, the Company entered into a subsequent "at-the-market" sales agreement, as amended in February 2019, or the 2017 Sales Agreement, with Cowen, through which the Company may offer and sell shares of its common stock having an aggregate offering of up to $100.0 million through Cowen, as the Company's sales agent. Similar to the 2016 Sales Agreement, the Company will pay Cowen a commission of up to 3% of the gross proceeds of sales made through the arrangement. During the year ended December 31, 2017, the Company received net proceeds of $18.5 million, after deducting commissions and expenses payable by the Company, from the sale of 1,670,649 shares of common stock pursuant to the 2017 Sales Agreement. There were no sales of shares of common stock pursuant to the 2017 Sales Agreement during the year ended December 31, 2018. As of December 31, 2018, the Company had an aggregate of $81.5 million remaining for future sales under the 2017 Sales Agreement, subject to the continued effectiveness of its shelf registration statement on Form S-3 (Registration No. 333-219639) or an effective replacement shelf registration statement.

10. Warrants

The Company had issued and outstanding warrants as follows:

	Warrants Outstanding			Exercise	
	December 31, 2018	December 31, 2017	Issuance Date	Price per Share	Terms (Years)
Type of Security:					
Common	—	1,152	November 2008	$ 34.73	10.0
Common	720	720	January 2009	$ 34.73	10.8
Common	288	288	February 2009	$ 34.73	10.0
Common	360	360	March 2009	$ 34.73	10.0
Common	144	144	April 2009	$ 34.73	10.0
Common	13,235	13,235	July 2009	$ 1.89	10.0
Common	2,400	2,400	April 2011	$ 1.88	10.0
Common	19,867	19,867	April 2011	$ 0.01	10.0
Common	6,031	6,031	October 2011	$ 0.01	9.5
Common	19,078	22,395	September 2013	$ 0.02	10.0
Common	2,786	2,786	December 2013	$ 0.02	10.0
Total	64,909	69,378			

11. Equity Incentive Plans

2015 Plan

In March 2015, the Company's board of directors adopted and in April 2015 the Company's stockholders approved the 2015 Equity Incentive Plan, or the 2015 Plan, which became effective upon the IPO and provides for the granting of incentive stock options, nonstatutory stock options and other forms of stock awards to its employees, directors and consultants. The Company's 2009 Stock Incentive Plan, or the 2009 Plan, terminated on the date the 2015 Plan was adopted. Options granted or shares issued under the 2009 Plan that were outstanding on the date the 2015 Plan became effective will remain subject to the terms of the 2009 Plan.

The 2015 Plan is administered by the board of directors or a committee appointed by the board of directors, which determines the types of awards to be granted, including the number of shares subject to the awards, the exercise price and the vesting schedule. The exercise price of incentive stock options and nonqualified stock options will be no less than 100% of the fair value per share of the Company's common stock on the date of grant. If an individual owns capital stock representing more than 10% of the voting shares, the price of each share will be at least 110% of the fair value on the date of grant. Options expire after 10 years (five years for stockholders owning greater than 10% of the voting stock). The number of shares of common stock initially reserved for issuance under the 2015 Plan was 6,134,292 shares with an automatic annual increase to the shares issuable under the 2015 Plan to the lower of (i) 4% of the total number of shares of common stock outstanding on December 31 of the preceding calendar year, or (ii) a lower number determined by the board of directors. On January 1, 2018 the shares issuable under the 2015 Plan increased by 3,109,448. The Company had 7,255,050 shares available for future grant under the 2015 Plan as of December 31, 2018.

2009 Plan

The Company's 2009 Stock Incentive Plan, or the 2009 Plan, terminated on the date the 2015 Plan was adopted. Options granted or shares issued under the 2009 Plan that were outstanding on the date the 2015 Plan became effective will remain subject to the terms of the 2009 Plan. Prior to the 2009 Plan termination, the number of options available for grant was increased by 360,000 shares. At December 31, 2018, 3,441,523 options under the 2009 Plan remained outstanding.

Stock option activity under the Company's stock option plan was as follows:

	Options Outstanding			
	Shares Available for Grant	Number of Options	Weighted-Average Exercise Price	Aggregate Intrinsic Value
				(In thousands)
Balance—December 31, 2017	6,117,580	9,076,018	$ 8.04	$ 32,256
Authorized	3,109,448			
RSU granted, net	(480,048)			
Granted	(3,309,250)	3,309,250	$ 6.09	
Exercised		(1,404,422)	$ 1.04	
Canceled	1,817,320 (1)	(1,994,836)	$ 11.97	
Balance—December 31, 2018	7,255,050	8,986,010	$ 7.54	$ 5,458
Options exercisable—December 31, 2018		5,864,229	$ 7.23	$ 5,425
Options vested and expected to vest—December 31, 2018		8,835,382	$ 7.55	$ 5,458

(1) The amount excludes 177,516, 253,611 and 52,463 canceled options for the years ended December 31, 2018, 2017 and 2016, respectively, initially granted from the legacy stock option plans. As these plans have been terminated, any options canceled are not added back to the existing option plan pool.

The aggregate intrinsic value represents the difference between the exercise price of the options and the closing price of the Company's common stock.

The aggregate intrinsic value of options exercised was $9.1 million, $19.2 million and $12.2 million for the years ended December 31, 2018, 2017 and 2016, respectively.

The weighted-average grant date fair value of employee options granted during the years ended December 31, 2018, 2017 and 2016 were $3.96, $6.91 and $8.01 per share, respectively.

At December 31, 2018, the weighted-average remaining contractual life was 5.4 years and 6.6 years for exercisable options and vested and expected to vest options, respectively. The weighted-average remaining contractual life of options outstanding was 6.6 years, 6.8 years and 7.5 years at December 31, 2018, 2017 and 2016, respectively.

As of December 31, 2018, the total unrecognized compensation expense related to unvested options, net of estimated forfeitures, was $15.8 million, which the Company expects to recognize over an estimated weighted-average period of 2.6 years.

Restricted Stock Units (RSUs)

In September 2016, the Company's board of directors authorized the issuance of restricted stock units, or RSUs, under the 2015 Plan and adopted a form of restricted stock unit grant notice and restricted stock unit award agreement, which is intended to serve as a standard form agreement for RSU grants issued to employees, executive officers, directors and consultants.

The following table summarizes RSU activity:

	RSUs Outstanding	
	Number of Restricted Stock Units	Weighted-Average Grant Date Fair Value Per Share
Balance—December 31, 2017	1,436,623	$ 11.47
Granted	1,089,450	6.94
Vested	(316,453)	11.57
Canceled/forfeited	(609,402)	10.28
Balance—December 31, 2018	1,600,218	$ 8.81

The fair value of RSUs is determined on the date of grant based on the market price of the Company's common stock on that date. As of December 31, 2018, there was $12.5 million of unrecognized stock-based compensation expense, net of estimated forfeitures, related to RSUs which is expected to be recognized over a weighted-average period of 3.1 years.

2015 Employee Stock Purchase Plan

In March 2015, the Company's board of directors adopted and in April 2015 the Company's stockholders approved the 2015 Employee Stock Purchase Plan, or 2015 ESPP, which became effective upon the IPO. The 2015 ESPP is intended to qualify as an employee stock purchase plan under Section 423 of the Code, and is administered by the Company's board of directors or a committee of the board of directors.

The number of shares of common stock initially reserved for issuance under the 2015 ESPP was 720,000 shares with an automatic annual increase to the shares issuable under the 2015 ESPP to the lower of (i) 1% of the total number of shares of common stock outstanding on December 31 of the preceding calendar year, or (ii) a lower number determined by the board of directors. There was no annual increase of shares issuable under the 2015 ESPP on January 1, 2018. The Company had 1,681,668 shares available for future issuance under the 2015 ESPP as of December 31, 2018. Employees purchased 111,321 shares for $529,000 under the 2015 ESPP during the year ended December 31, 2018.

The following table summarizes the assumptions used in the Black-Scholes option-pricing model to determine fair value of the Company's common shares to be issued under the 2015 ESPP:

	Year Ended December 31,		
	2018	2017	2016
Expected term (in years)	0.5	0.5	0.5
Volatility	62.5%	49.3%	73.8 - 74.4%
Risk-free interest rate	2.37%	1.39%	0.38 - 0.62%
Dividend yield	—%	—%	—%

As of December 31, 2018, there was $96,000 of unrecognized stock-based compensation expense related to the 2015 ESPP, which is expected to be recognized over a weighted-average period of 0.4 years.

Stock-based Compensation Expense

Total stock-based compensation expense recognized was as follows (in thousands):

	Year Ended December 31,		
	2018	2017	2016
Research and development	$ 9,745	$ 9,205	$ 9,131
General and administrative	7,729	7,171	5,875
Total stock-based compensation expense	$ 17,474	$ 16,376	$ 15,006

In determining the fair value of the stock-based awards, the Company uses the Black-Scholes option-pricing model and assumptions discussed below. Each of these inputs is subjective and generally requires significant judgment.

Fair Value of Common Stock. Prior to the IPO in April 2015, the board of directors determined the fair value of the Company's common stock by taking into consideration, among other things, contemporaneous valuations of the common stock prepared by an unrelated third-party valuation firm. Given the previous absence of a public trading market for the common stock, the board of directors exercised reasonable judgment and considered a number of objective and subjective factors to determine the best estimate of the fair value of the common stock, including the Company's stage of development; progress of its research and development efforts; the rights, preferences and privileges of its preferred stock relative to those of its common stock; equity market conditions affecting comparable public companies and the lack of marketability of the common stock.

Since the Company's IPO, it has used the market closing price of its common stock as reported on the Nasdaq Global Select Market.

Expected Term—The Company's expected term represents the period that the Company's stock-based awards are expected to be outstanding and is determined using the simplified method (based on the mid-point between the vesting date and the end of the contractual term).

Expected Volatility—Because the Company does not have a long trading history for its common stock, the expected volatility was estimated based on the average volatility for comparable publicly traded biopharmaceutical companies over a period equal to the expected term of the stock option grants. The comparable companies were chosen based on their similar size, stage in the life cycle or area of specialty.

Risk-Free Interest Rate—The risk-free interest rate is based on the U.S. Treasury zero coupon issues in effect at the time of grant for periods corresponding with the expected term of option.

Expected Dividend—The Company has never paid dividends on its common stock and has no plans to pay dividends on its common stock. Therefore, the Company used an expected dividend yield of zero.

The fair value of stock option awards granted to employees was estimated at the date of grant using a Black-Scholes option-pricing model with the following assumptions:

	Year Ended December 31,		
	2018	2017	2016
Expected term (in years)	5.3 - 6.1	5.3 - 6.5	5.3 - 6.1
Volatility	70.5% - 71.7%	71.8 - 74.1%	72.3 - 74.5%
Risk-free interest rate	2.38% - 3.08%	1.78 - 2.25%	1.25 - 2.07 %
Dividend yield	—%	—%	—%

For the years ended December 31, 2018, 2017 and 2016, the Company recognized $11.5 million, $11.4 million and $10.0 million, respectively, of stock-based compensation related to options granted to employees. The compensation expense is allocated on a departmental basis, based on the classification of the option holder.

The Company uses the fair value method to value options granted to non-employees. For the years ended December 31, 2018, 2017 and 2016, the Company recognized stock-based compensation of $209,000, $489,000 and $438,000, respectively, related to options granted to non-employees.

The fair value of stock option awards granted to non-employees was estimated at the date of grant using a Black-Scholes option-pricing model with the following assumptions:

	Years Ended December 31,		
	2018	2017	2016
Expected term (in years)	6.0 - 9.7	6.7 - 10.0	6.0 - 9.6
Volatility	70.5% - 71.7%	72.2 - 73.0%	72.8 - 74.3%
Risk-free interest rate	2.66% - 3.19%	2.24 - 2.45%	1.35 - 2.48 %
Dividend yield	—%	—%	—%

12. Income Taxes

The components of loss before income tax benefit were as follows (in thousands):

	Year Ended December 31,		
	2018	2017	2016
Domestic	$ (77,066)	$ (76,503)	$ (56,237)
Foreign	(19,074)	(26,724)	(13,447)
Total	$ (96,140)	$ (103,227)	$ (69,684)

The income tax provision (benefit) consists of the following (in thousands):

	Year Ended December 31,		
	2018	2017	2016
Current income tax (benefit) provision:			
Federal	$ (637)	$ (17,544)	$ 28,759
State	—	—	—
Foreign	—	—	—
Total	$ (637)	$ (17,544)	$ 28,759
Deferred income tax provision (benefit):			
Federal	—	6,319	(6,319)
State	—	—	—
Foreign	(146)	(139)	(976)
Total	(146)	6,180	(7,295)
Total income tax (benefit) provision	$ (783)	$ (11,364)	$ 21,464

A reconciliation of the statutory U.S. federal rate to the Company's effective tax rate is as follows:

	Year Ended December 31,		
	2018	2017	2016
Expected provision at statutory rate federal rate	(21.0%)	(35.0%)	(35.0%)
State taxes, net of federal benefits	—	—	—
U.S. tax credits	(2.8)	(6.4)	(43.8)
Warrants	—	—	—
Add back of Orphan Drug Credit	—	1.4	7.4
Incentive stock option compensation	1.3	(3.2)	3.8
Tax Cuts and Jobs Act impact	—	29.0	—
Other	(2.6)	(0.4)	(0.6)
Foreign income tax rate differential	0.5	3.4	2.4
Change in valuation allowance	23.8	0.2	96.6
Total	(0.8%)	(11.0%)	30.8%

The decrease in the effective tax rate from (11%) during 2017 to (0.8%) during 2018 was primarily related to the carry back benefit recorded in 2017.

The tax effects of temporary differences and carryforwards that give rise to significant portions of the deferred tax assets and liabilities are as follows (in thousands):

	Year Ended December 31,	
	2018	2017
Deferred tax assets:		
Net operating loss carryforwards	$ 38,562	$ 16,847
Tax credits	41,193	37,656
Stock-based compensation	6,326	5,030
Deferred revenue	34,897	35,604
Accruals and reserves	3,659	3,378
Gross deferred tax assets	124,637	98,515
Valuation allowance	(119,451)	(93,227)
Total deferred tax assets	5,186	5,288
Deferred tax liabilities:		
Tangible assets	(3,728)	(3,871)
Intangible assets	(7,562)	(7,955)
Total deferred tax liabilities	(11,290)	(11,826)
Net deferred tax liabilities	$ (6,104)	$ (6,538)

The Company is required to reduce its deferred tax assets by a valuation allowance if it is more likely than not that some or all of its deferred tax assets will not be realized. Management must use judgment in assessing the potential need for a valuation allowance, which requires an evaluation of both negative and positive evidence. The weight given to the potential effect of negative and positive evidence should be commensurate with the extent to which it can be objectively verified. In determining the need for and amount of the valuation allowance, if any, the Company assesses the likelihood that it will be able to recover its deferred tax assets using historical levels of income, estimates of future income and tax planning strategies. As a result of historical consolidated cumulative losses, the Company determined that, based on all available evidence, there was substantial uncertainty as to whether it will recover its recorded net deferred taxes in future periods. As a result, the Company recorded a valuation allowance against the net deferred tax assets at December 31, 2018 and at December 31, 2017. The net valuation allowance increased by $26.2 million and $8.7 million in 2018 and 2017, respectively.

On December 22, 2017, the Tax Cuts and Jobs Act, or the Tax Act, was signed into law. Among other changes is a permanent reduction in the U.S. federal corporate income tax rate from 35% to 21% effective January 1, 2018. As a result of the reduction in the corporate income tax rate, the Company revalued its net deferred tax assets, which resulted in a reduction in the value of our deferred tax asset of approximately $26.5 million, offset by the change in valuation allowance of $26.5 million, for the year ended December 31, 2017. In addition, the Tax Act repeals the two-year carryback for losses arising in tax years ending after 2017. As a result, the Company recognized deferred tax expense of $3.4 million for the year ended December 31, 2017 due to the inability to carryback existing temporary differences after 2017.

Also on December 22, 2017, the SEC issued Staff Accounting Bulletin 118, or SAB 118, which provides guidance on accounting for tax effects of the Tax Act. SAB 118 provides a measurement period that should not extend beyond one year from the Tax Act enactment date for companies to complete the accounting under ASC 740. In accordance with SAB 118, a company must reflect the income tax effects of those aspects of the Tax Act for which the accounting under ASC 740 is complete. To the extent that a company's accounting for certain income tax effects of the Tax Act is incomplete but it is able to determine a reasonable estimate, it must record a provisional estimate to be included in the financial statements. Provisional amounts or adjustments to provisional amounts identified in the measurement period, as defined, would be included as an adjustment to tax expense or benefit from continuing operations in the period the amounts are determined. Due to the broad complexities of the Tax Act, under the guidance of SAB 118, the Company previously provided a provisional estimate of the effect of the Tax Act in its financial statements. In the fourth quarter of 2018, the Company completed its analysis to determine the effect of the Tax Act and recorded immaterial adjustments as of December 31, 2018.

At December 31, 2018, the Company has generated net operating loss, or NOL, carryforwards (before tax effects) for federal, state and foreign income tax purposes of $102.8 million, $64.4 million and $49.9 million, respectively. These federal, state and foreign NOL carryforwards will begin to expire in 2027, 2033 and 2025, respectively, if not utilized. In addition, the Company has federal and state tax credit carryforwards of $39.6 million and $7.9 million, respectively, to offset future income tax liabilities. The federal tax credits can be carried forward for 20 years and will start to expire in 2034, if not utilized, while the state research and development tax credit can be carried forward indefinitely.

Under Section 382 of the Code, the Company's ability to utilize NOL carryforwards or other tax attributes, such as federal tax credits, in any taxable year may be limited if the Company has experienced an "ownership change." Generally, a Section 382 ownership change occurs if one or more stockholders or groups of stockholders who owns at least 5% of a corporation's stock increases its ownership by more than 50 percentage points over its lowest ownership percentage within a specified testing period. Similar rules may apply under state tax laws. The Company experienced an ownership change that it believes under Section 382 of the Code will result in limitations in its ability to utilize net operating losses and credits. In addition, the Company may experience future ownership changes as a result of future offerings or other changes in ownership of its stock. As a result, the amount of the NOLs and tax credit carryforwards presented in the financial statements could be limited and may expire unutilized.

Uncertain Tax Positions

A reconciliation of the Company's unrecognized tax benefits for the years ended December 31, 2018 and 2017 is as follows (in thousands):

	Year Ended December 31,	
	2018	2017
Balance at beginning of year	$ 4,090	$ 2,508
Additions based on tax positions related to prior year	3	293
Reductions based on tax positions related to prior year	(7)	—
Additions based on tax positions related to current year	1,120	1,289
Balance at end of year	$ 5,206	$ 4,090

Without regard to the valuation allowance, $800,000 of unrecognized tax benefits included in the consolidated balance sheet would, if recognized, affect the effective tax rate.

The Company does not foresee material changes to its gross uncertain income tax position liability within the next 12 months.

The Company files income tax returns in the United States and the Netherlands. The federal and state income tax returns are open under the statute of limitations subject to tax examinations for the tax years ended December 31, 2015 through December 31, 2017. To the extent the Company has tax attribute carryforwards, the tax years in which the attribute was generated may still be adjusted upon examination by the IRS or state tax authorities to the extent utilized in a future period. For the Netherlands, the tax administration can impose an additional assessment within five years from the year in which the tax debt originated.

The Company will recognize accrued interest and penalties related to unrecognized tax benefits as income tax expense in its consolidated statements of operations. At December 31, 2018, the Company has recorded no interest and penalties.

13. Employee Benefit Plan

The Company sponsors a 401(k) plan. All employees are eligible to participate in the 401(k) plan after meeting certain eligibility requirements. Participants may elect to have a portion of their salary deferred and contributed to the 401(k) plan up to the limit allowed under the Code.

14. Net Loss per Common Share

Because the Company was in a loss position for all periods presented, diluted net loss per common share is the same as basic net loss per common share for all periods presented as the inclusion of all potential common shares outstanding would have been anti-dilutive. Potentially dilutive securities that were not included in the diluted per common share calculations because they would be anti-dilutive were as follows:

	December 31,		
	2018	2017	2016
Options to purchase common stock	8,986,010	9,076,018	10,690,156
Common stock warrants	64,909	69,378	97,621
Restricted stock awards	1,600,218	1,436,623	657,200
Total	10,651,137	10,582,019	11,444,977

15. Selected Quarterly Financial Data (Unaudited)

The following interim financial information presents the Company's 2018 and 2017 results of operations on a quarterly basis (in thousands, except per share amounts):

	Quarter Ended			
	March 31, 2018	June 30, 2018	September 30, 2018	December 31, 2018
Total revenue	$ 6,627	$ 2,639	$ 3,063	$ 2,758
Net loss	(21,494)	(24,397)	(23,146)	(26,320)
Net loss per common share, basic	(0.28)	(0.31)	(0.29)	(0.33)
Net loss per common share, diluted	(0.28)	(0.31)	(0.29)	(0.33)

	Quarter Ended			
	March 31, 2017	June 30, 2017	September 30, 2017	December 31, 2017
Total revenue	$ 3,772	$ 5,917	$ 3,794	$ 3,756
Net loss	(21,812)	(19,400)	(24,520)	(26,131)
Net loss per common share, basic	(0.32)	(0.27)	(0.33)	(0.34)
Net loss per common share, diluted	(0.32)	(0.27)	(0.33)	(0.34)

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 President and Chief Executive Officer and our Chief Financial Officer, have evaluated our disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, as amended) as of December 31, 2018. Based on that evaluation, our President and Chief Executive Officer and our Chief Financial Officer have concluded that, as of December 31, 2018, our disclosure controls and procedures were, in design and operation, effective.

Management's report on internal control over financial reporting.

Our management is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in Rule 13a-15(f) under the Securities Exchange Act of 1934, as amended. Our management conducted an evaluation of the effectiveness of our internal control over financial reporting based on the 2013 framework in Internal Control—Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission. Based on its evaluation under the framework in Internal Control—Integrated Framework, our management concluded that our internal control over financial reporting was effective as of December 31, 2018.

Changes in internal control over financial reporting.

There were no changes in our internal control over financial reporting identified in connection with the evaluation required by Rule 13a-15(d) and 15d-15(d) of the Exchange Act that occurred during the quarter ended December 31, 2018 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Inherent limitation on the effectiveness of internal control.

The effectiveness of any system of internal control over financial reporting, including ours, is subject to inherent limitations, including the exercise of judgment in designing, implementing, operating, and evaluating the controls and procedures, and the inability to eliminate misconduct completely. Accordingly, any system of internal control over financial reporting, including ours, no matter how well designed and operated, can only provide reasonable, not absolute assurances. In addition, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate. We intend to continue to monitor and upgrade our internal controls as necessary or appropriate for our business, but cannot assure you that such improvements will be sufficient to provide us with effective internal control over financial reporting.

Attestation Report of the Registered Public Accounting Firm

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

Item 9B. Other Information.

None.

PART III

Item 10. Directors, Executive Officers and Corporate Governance.

Information required by this item will be contained in our definitive proxy statement to be filed with the Securities and Exchange Commission on Schedule 14A in connection with our 2019 Annual Meeting of Stockholders, or the Proxy Statement, which will be filed no later than 120 days after the end of our fiscal year ended December 31, 2018, under the headings "Executive Officers," "Election of Directors," "Corporate Governance" and " Section 16(a) Beneficial Ownership Reporting Compliance," and is incorporated herein by reference.

We have adopted a Code of Business Conduct and Ethics that applies to our officers, directors and employees which is available on our website at www.aduro.com. The Code of Business Conduct and Ethics is intended to qualify as a "code of ethics" within the meaning of Section 406 of the Sarbanes-Oxley Act of 2002 and Item 406 of Regulation S-K. In addition, we intend to promptly disclose (1) the nature of any amendment to our Code of Business Conduct and Ethics that applies to our principal executive officer, principal financial officer, principal accounting officer or controller or persons performing similar functions and (2) the nature of any waiver, including an implicit waiver, from a provision of our code of ethics that is granted to one of these specified officers, the name of such person who is granted the waiver and the date of the waiver on our website in the future.

Item 11. Executive Compensation.

The information required by this item regarding executive compensation will be incorporated by reference to the information set forth in the sections titled "Executive Compensation" and "Director Compensation" in our Proxy Statement.

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

The information required by this item regarding security ownership of certain beneficial owners and management and our equity compensation plans will be incorporated by reference to the information set forth in the sections titled "Security Ownership of Certain Beneficial Owners and Management" and "Equity Compensation Plan Information" in our Proxy Statement.

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

The information required by this item regarding certain relationships and related transactions and director independence will be incorporated by reference to the information set forth in the sections titled "Certain Relationships and Related Party Transactions" and "Election of Directors", respectively, in our Proxy Statement.

Item 14. Principal Accounting Fees and Services.

The information required by this item regarding principal accountant fees and services will be incorporated by reference to the information set forth in the section titled "Principal Accountant Fees and Services" in our Proxy Statement.

PART IV

Item 15. Exhibits, Financial Statement Schedules.

(a) The following documents are filed as part of this report:

1. Financial Statements

   Information in response to this Item is included in Part II, Item 8 of this Annual Report on Form 10-K.

2. Financial Statement Schedules

   All schedules are omitted because they are not applicable or the required information is shown in the financial statements or notes thereto.

3. Exhibits

   See Item 15(b) below.

(b) We have filed, or incorporated into this Annual Report on Form 10-K by reference, the exhibits listed on the Exhibit Index below.

(c) See Item 15(a)2 above.

Exhibit No.	Description of Exhibit	Incorporated by Reference				Filed Herewith
		Form	File No.	Exhibit	Filing Date	
3.1	Restated Certificate of Incorporation of Aduro Biotech, Inc.	8-K	001-37345	3.1	04/20/2015	
3.2	Amended and Restated Bylaws of Aduro Biotech, Inc.	S-1/A	333-202667	3.5	04/06/2015	
4.1	Form of common stock certificate.	S-1/A	333-202667	4.1	04/06/2015	
4.2	Amended and Restated Investor Rights Agreement, by and among Aduro Biotech, Inc. and the stockholders named therein, dated December 19, 2014.	S-1	333-202667	4.2	03/11/2015	
5.1	Opinion of Latham & Watkins LLP					X
10.1+	2000 Oncologic Equity Incentive Plan.	S-1	333-202667	10.1	03/11/2015	
10.2+	Forms of Stock Option Agreement and Notice of Grant of Stock Option under the 2000 Oncologic Equity Incentive Plan.	S-1	333-202667	10.2	03/11/2015	
10.3+	2001 Triton BioSystems Equity Incentive Plan.	S-1	333-202667	10.3	03/11/2015	
10.4+	Forms of Stock Option Agreement and Notice of Grant of Stock Option under the 2001 Triton BioSystems Equity Incentive Plan.	S-1	333-202667	10.4	03/11/2015	
10.5+	Aduro Biotech 2009 Stock Incentive Plan.	S-1	333-202667	10.5	03/11/2015	
10.6+	Forms of Stock Option Agreement and Notice of Grant of Stock Option under the 2009 Stock Plan.	S-1	333-202667	10.6	03/11/2015	
10.7+	2015 Equity Incentive Plan.	S-1/A	333-202667	10.7	04/06/2015	
10.8+	Forms of Stock Option Agreement and Notice of Grant of Stock Option under the 2015 Equity Incentive Plan.	S-1/A	333-202667	10.8	04/06/2015	
10.9+	2015 Employee Stock Purchase Plan.	S-1/A	333-202667	10.9	04/06/2015	
10.10+	Form of Indemnification Agreement made by and between Aduro Biotech, Inc. and each of its directors and executive officers.	S-1	333-202667	10.11	03/11/2015	
10.11+	Executive Employment Agreement between Aduro Biotech, Inc. and Stephen T. Isaacs, dated February 26, 2010.	S-1	333-202667	10.12	03/11/2015	
10.12+	Amendment to Executive Employment Agreement between Aduro Biotech, Inc. and Stephen T. Isaacs, dated July 31, 2014.	S-1	333-202667	10.13	03/11/2015	
10.13+	Offer of Employment Letter between Aduro Biotech, Inc. and Gregory W. Schafer, dated April 28, 2013.	S-1	333-202667	10.14	03/11/2015	
10.14†	Research and License Agreement between Aduro Biotech, Inc. and Janssen Biotech, Inc., dated as of May 27, 2014.	S-1	333-202667	10.18	03/11/2015	

Exhibit No.	Description of Exhibit	Incorporated by Reference				Filed Herewith
		Form	File No.	Exhibit	Filing Date	
10.15†	GVAX Prostate License Agreement between Aduro Biotech, Inc. and Janssen Biotech, Inc., dated as of May 27, 2014.	S-1	333-202667	10.19	03/11/2015	
10.16†	Research and License Agreement between Aduro Biotech, Inc. and Janssen Biotech, Inc., dated as of October 13, 2014.	S-1	333-202667	10.20	03/11/2015	
10.17†	Exclusive License Agreement between Aduro Biotech, Inc. and the Regents of the University of California, dated March 15, 2012.	S-1	333-202667	10.22	03/11/2015	
10.18†	License Agreement between Karagen Pharmaceuticals, Inc. and Aduro Biotech, Inc., dated June 20, 2012.	S-1	333-202667	10.26	03/11/2015	
10.19†	Exclusive License between Aduro Biotech, Inc. and the Regents of the University of California, dated September 25, 2014.	S-1	333-202667	10.27	03/11/2015	
10.20†	Exclusive License Agreement among Aduro Biotech, Inc., Memorial Sloan Kettering Cancer Center, The Rockefeller University, Rutgers, the State University of New Jersey and University of Bonn, dated December 18, 2014.	S-1	333-202667	10.28	03/11/2015	
10.21	Fourth Addendum to Office Lease, dated February 20, 2015, by and between the Company and Bancroft Way, LLC.	S-1	333-202667	10.31	03/11/2015	
10.22†	Amendment No. 1 to Exclusive License between Aduro Biotech, Inc. and the Regents of the University of California, dated March 6, 2015.	S-1	333-202667	10.32	03/11/2015	
10.23+	Aduro Biotech, Inc. Non-Employee Director Compensation Policy.	S-1/A	333-202667	10.33	04/06/2015	
10.24†	Collaboration and License Agreement between Aduro Biotech, Inc. and Novartis Pharmaceuticals Corporation, dated March 12, 2015; and the related letter agreement dated March 19, 2015.	S-1/A	333-202667	10.34	04/06/2015	
10.25	Letter Agreement between Aduro Biotech, Inc. and Karagen Pharmaceuticals, Inc. dated June 5, 2015.	10-Q	001-37345	10.38	08/11/2015	
10.26†	Office/Laboratory Lease between Seventh Street Properties VII, LLC and Aduro Biotech, Inc., dated September 11, 2015.	10-Q	001-37345	10.1	11/23/2015	
10.27+	Offer of Employment between Blaine Templeman and Aduro Biotech, Inc., dated September 18, 2015.	10-Q	001-37345	10.2	11/23/2015	

Exhibit No.	Description of Exhibit	Incorporated by Reference				Filed Herewith
		Form	File No.	Exhibit	Filing Date	
10.28†	Amendment to Research and License Agreements between Aduro Biotech, Inc. and Janssen Biotech, Inc., dated November 11, 2015.	10-K	001-37345	10.41	03/08/2016	
10.29	Common Stock Sales Agreement between Aduro Biotech, Inc. and Cowen and Company, LLC, dated May 2, 2016.	10-Q	001-37345	10.1	05/02/2016	
10.30	First Amendment to Lease, dated April 26, 2016.	10-Q	001-37345	10.2	08/03/2016	
10.31	Form of Restricted Stock Unit Grant Notice and Restricted Stock Unit Award Agreement.	8-K	001-37345	10.1	09/14/2016	
10.32	Newly Appointed CMO Offer of Employment Letter between Aduro Biotech, Inc. and Natalie Sacks, M.D., dated as of August 4, 2016.	10-Q	001-37345	10.2	11/02/2016	
10.33	Amended and Restated Severance Plan, dated as of December 9, 2016.	10-K	001-37345	10.44	03/01/2017	
10.34†	Amendment No. 1 to Exclusive License Agreement between Aduro Biotech, Inc. and the Memorial Sloan Kettering Cancer Center, dated May 27, 2016.	10-K	001-37345	10.45	03/01/2017	
10.35†	Amendment No. 2 to Exclusive License Agreement between Aduro Biotech, Inc. and the Memorial Sloan Kettering Cancer Center, dated October 10, 2016.	10-K	001-37345	10.46	03/01/2017	
10.36	Common Stock Sales Agreement between Aduro Biotech, Inc. and Cowen and Company, LLC, dated August 2, 2017.	10-Q	001-37345	10.1	08/02/2017	
10.41#	Research Collaboration and Exclusive License Agreement between Aduro Biotech, Inc. and Eli Lilly and Company, dated December 18, 2018.					X
10.42	Amendment No. 1 to Sales Agreement between Aduro Biotech, Inc. and Cowen and Company, LLC, dated February 27, 2019.					X
21.1	Subsidiaries of the Registrant					X
23.1	Consent of Deloitte & Touche LLP, independent registered public accounting firm.					X
23.2	Consent of Latham & Watkins LLP (included in Exhibit 5.1)					X
24.1	Power of Attorney (included in the signature page hereto).					X
31.1	Certification of Principal Executive Officer pursuant to rules 13a-14(a) and 15d-14(a) under the Securities Exchange Act of 1934, as amended.					X

Exhibit No.	Description of Exhibit	Incorporated by Reference				Filed Herewith
		Form	File No.	Exhibit	Filing Date	
31.2	Certification of Principal Financial Officer pursuant to rules 13a-14(a) and 15d-14(a) under the Securities Exchange Act of 1934, as amended.					X
32.1*	Certification of Principal Executive Officer and Principal Financial Officer, as required by rules 13a-14(a) and 15d-14(a) and Section 1350 of Chapter 63 of Title 18 of the United States Code (18 U.S.C. 1350).					X
101.INS	XBRL Instance Document					X
101.SCH	XBRL Taxonomy Extension Schema Document					X
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document					X
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document					X
101.LAB	XBRL Taxonomy Extension Label Linkbase Document					X
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document					X

+ Indicates management contract or compensatory plan, contract or agreement.

† Confidential treatment has been granted for a portion of this exhibit.

* The certifications attached as Exhibit 32.1 accompany this Annual Report on Form 10-K pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, and shall not be deemed "filed" by the Registrant for purposes of Section 18 of the Securities Exchange Act of 1934, as amended.

Confidential treatment has been requested for a portion of this exhibit.

(c) See Item 15(a)2 above.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, as amended, the Registrant has duly caused this Report to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Berkeley, State of California, on the 27th day of February, 2019.

ADURO BIOTECH, INC.

By: /s/ Stephen T. Isaacs
Stephen T. Isaacs
Chairman, President and Chief Executive Officer
(principal executive officer)

POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints Stephen T. Isaacs and Jennifer Lew, and each of them, as his or her true and lawful attorneys-in-fact and agents, each with the full power of substitution, for him or her and in his or her name, place or stead, in any and all capacities, to sign any and all amendments to this Annual Report on Form 10-K, and to file the same, with all exhibits thereto and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done in and about the premises, as fully to all intents and purposes as he or she might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, or their, his or her substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Exchange Act of 1934, as amended, 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/ Stephen T. Isaacs Stephen T. Isaacs	Chairman, President and Chief Executive Officer *(principal executive officer)*	February 27, 2019
/s/ Jennifer Lew Jennifer Lew	Chief Financial Officer (*principal financial and accounting officer*)	February 27, 2019
/s/ William M. Greenman William M. Greenman	Director	February 27, 2019
/s/ Ross Haghighat Ross Haghighat	Director	February 27, 2019
/s/ Stephanie O'Brien Stephanie Monaghan O'Brien	Director	February 27, 2019
/s/ Stephen A. Sherwin Stephen A. Sherwin	Director	February 27, 2019
 David H. Mack	Director	February 27, 2019

Exhibit 5.1

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Menlo Park, California 94025
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www.lw.com
FIRM / AFFILIATE OFFICES

LATHAM & WATKINS LLP

FIRM / AFFILIATE OFFICES

Beijing	Moscow
Boston	Munich
Brussels	New York
Century City	Orange County
Chicago	Paris
Dubai	Riyadh
Düsseldorf	Rome
Frankfurt	San Diego
Hamburg	San Francisco
Hong Kong	Seoul
Houston	Shanghai
London	Silicon Valley
Los Angeles	Singapore
Madrid	Tokyo
Milan	Washington, D.C.

February 27, 2019

Aduro Biotech, Inc.
740 Heinz Avenue
Berkeley, CA 94110

Re: Registration Statement No. 333-219639; Up to $81,500,000 of Shares of Common Stock, par value $0.0001 per share

Ladies and Gentlemen:

We have acted as special counsel to Aduro Biotech, Inc., a Delaware corporation (the "***Company***"), in connection with the proposed issuance from time to time of shares of common stock of the Company, par value $0.0001 per share, having an aggregate offering price of up to $81,500,000 (the "***Shares***"), by the Company pursuant to the Sales Agreement, dated August 2, 2017, between the Company and Cowen & Company, LLC, as amended by Amendment No. 1 thereto, dated February 27, 2019 (together as amended, the "***Sales Agreement***"). The Shares are included in a registration statement on Form S-3 under the Securities Act of 1933, as amended (the "***Act***"), filed with the Securities and Exchange Commission (the "***Commission***") on August 2, 2017 (Registration No. 333–219639) (as amended, the "***Registration Statement***"), a related base prospectus dated August 2, 2017 (the "***Base Prospectus***") and a prospectus supplement dated February 27, 2019 to be filed with the Commission pursuant to Rule 424(b) under the Act (the "***Sales Agreement Prospectus***" and, together with the Base Prospectus, the "***Prospectus***"). This opinion is being furnished in connection with the requirements of Item 601(b)(5) of Regulation S-K under the Act. No opinion is expressed herein as to any matter pertaining to the contents of the Registration Statement or the Prospectus, other than as expressly stated herein with respect to the issue of the Shares.

As such counsel, we have examined such matters of fact and questions of law as we have considered appropriate for purposes of this letter. With your consent, we have relied upon certificates and other assurances of officers of the Company and others as to factual matters

without having independently verified such factual matters. We are opining herein as to the General Corporation Law of the State of Delaware, and we express no opinion with respect to any other laws.

Subject to the foregoing and the other matters set forth herein, it is our opinion that, as of the date hereof, when (i) the Shares shall have been duly registered on the books of the transfer agent and registrar therefor in the name or on behalf of the purchasers, and (ii) have been issued by the Company against payment therefor in total numbers that do not exceed the total number of shares available under the Company's certificate of incorporation and in the circumstances contemplated by the Sales Agreement, (a) the issue and sale of the Shares will have been duly authorized by all necessary corporate action of the Company, (b) the Shares will be validly issued, and (c) the Shares will be fully paid and nonassessable. In rendering the foregoing opinion, we have assumed that the Company will comply with all applicable notice requirements regarding uncertificated shares provided in the General Corporation Law of the State of Delaware.

This opinion is for your benefit in connection with the Registration Statement and may be relied upon by you and by persons entitled to rely upon it pursuant to the applicable provisions of the Act. We consent to your filing this opinion as an exhibit to the Company's Form 10-K dated February 27, 2019, and to the reference to our firm in the Prospectus under the heading "Legal Matters." In giving such consent, we do not thereby admit that we are in the category of persons whose consent is required under Section 7 of the Act or the rules and regulations of the Commission thereunder.

Very truly yours,

/s/ Latham & Watkins LLP

US-DOCS\106211869.3

Exhibit 10.41

[***] Certain information in this document has been omitted and filed separately with the Securities and Exchange Commission. Confidential treatment has been requested with respect to the omitted portions.

EXECUTION VERSION

RESEARCH COLLABORATION

AND EXCLUSIVE LICENSE AGREEMENT

BY AND BETWEEN

ADURO BIOTECH, INC.

and

ELI LILLY AND COMPANY

December 18, 2018

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(continued)

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[***] Certain information in this document has been omitted and filed separately with the Securities and Exchange Commission. Confidential treatment has been requested with respect to the omitted portions.

RESEARCH COLLABORATION AND EXCLUSIVE LICENSE AGREEMENT

This RESEARCH COLLABORATION AND EXCLUSIVE LICENSE AGREEMENT (this "**Agreement**") is entered into as of December 18, 2018 (the "**Effective Date**") by and between Aduro Biotech, Inc., a Delaware corporation having a place of business at 740 Heinz Avenue, Berkeley, California 94710 ("**Aduro**"), and Eli Lilly and Company, an Indiana corporation having a place of business at Lilly Corporate Center, Indianapolis, Indiana 46285 ("**Lilly**"). Each of Aduro and Lilly is sometimes referred to individually herein as a "**Party**" and collectively as the "**Parties**".

RECITALS

WHEREAS, Aduro is a biotechnology company which owns or otherwise controls patent rights and know-how, including its cGAS-STING pathway platform, designed to harness the body's natural immune system;

WHEREAS, Lilly is a pharmaceutical company having expertise in the discovery, development and commercialization of innovative human pharmaceutical products, including products for the Field (as defined below); and

WHEREAS, the Parties wish to collaborate in the development of products that are intended for use in the Field, pursuant to which the Parties will identify and research Collaboration Compounds (as defined below), including by way of application of Aduro's cGAS-STING pathway platform and the conduct by the Parties of activities under a Research Plan (as defined below) and the conduct by Lilly of clinical development and commercialization of such product in the Territory (as defined below), all subject to the terms and conditions set forth herein.

NOW, THEREFORE, in consideration of the mutual covenants contained herein, and for other good and valuable consideration, the Parties hereto, intending to be legally bound, hereby agree as follows:

1. DEFINITIONS

Whenever used in this Agreement with an initial capital letter, the terms defined in this Article 1 shall have the meanings specified herein.

1.1 "**AAA**" is defined in Schedule 12.3.

1.2 "**Aduro**" is defined in the Preamble.

1.3 "**Aduro Collaboration IP**" is defined in Section 10.2.2(a).

1.4 "**Aduro Indemnitees**" is defined in Section 14.1.

1.5 "**Aduro Indemnity Claims**" is defined in Section 14.1.

1.6 "**Aduro Know-How**" means any Know-How Controlled by Aduro or its Affiliates as of the Effective Date or during the Exclusivity Term that is necessary or reasonably useful for (a) the Research, Development, Manufacture, use, importation, or Commercialization (including offer for sale or sale) of a Collaboration Compound or Product or (b) the performance of the Research Activities; provided that "Aduro Know-How" does not include [***].

1.7 "**Aduro Patent Rights**" means any Patent Rights Controlled by Aduro or its Affiliates as of the Effective Date or during the Exclusivity Term, the practice of which is necessary or reasonably useful for (a) the Research, Development, Manufacture, use, importation, or Commercialization (including offer for sale or sale) of a Collaboration Compound or Product or (b) the performance of the Research Activities; provided that "Aduro Patent Rights" do not include [***].

1.8 "**Aduro Research Activities**" is defined in Section 4.1.2(a).

1.9 "**Aduro's Knowledge**" means all such facts, circumstances or other information, of which Aduro should be aware following reasonable investigation with respect to the subject matter of the relevant representation.

1.10 "**Adverse Event**" means any untoward medical occurrence in a Clinical Trial subject or patient who is administered a Product, whether or not considered related to such Product, including any undesirable sign (including abnormal laboratory findings of clinical concern), symptom or disease associated with the use of such Product.

1.11 "**Affiliate**" means, with respect to either Party, any Person that directly or indirectly controls, is controlled by or is under common control with such Party; for purposes of this definition, the term "control" (including, with correlative meaning, the terms "controlled by" or "under common control with") means direct or indirect ownership of more than fifty percent (50%), including ownership by trusts with substantially the same beneficial interests, of the voting and equity rights of such Person, firm, trust, corporation, partnership or other entity or combination thereof, or the power to direct the management of such Person, firm, trust, corporation, partnership or other entity or combination thereof.

1.12 "**Agreement**" is defined in the Preamble.

1.13 "**Alliance Manager**" is defined in Section 3.8.

1.14 "**ANDA**" is defined in Section 1.37.

1.15 "**Applicable Laws**" means any national, international, federal, state or local laws, treaties, statutes, ordinances, rules and regulations, including any rules, regulations, guidance, guidelines or requirements of any Regulatory Authority, national securities exchange or securities listing organization, that are in effect from time to time during the Term and apply to a particular activity or Party hereunder.

1.16 "**Auditor**" is defined in Section 8.3.5(b).

[***] Certain information in this document has been omitted and filed separately with the Securities and Exchange Commission. Confidential treatment has been requested with respect to the omitted portions.

1.17 "**Bankruptcy Code**" means, as applicable, (a) the U.S. Bankruptcy Code, as amended from time to time, and the rules and regulations and guidelines promulgated thereunder or (b) the applicable bankruptcy laws of any other country or competent Governmental Authority, as amended from time to time, and the rules and regulations and guidelines promulgated thereunder.

1.18 "**Baseline Quarter Volume**" means, on a country-by-country basis, the average cumulative unit volume of Product sold in such country during the four (4) consecutive Calendar Quarters that immediately precede the Calendar Quarter during which a Competing Generic with respect to such Product is First Commercially Sold in such country.

1.19 "**Business Day**" means a day other than (a) a Saturday or a Sunday, (b) a bank or other public holiday in New York, New York, or (c) the eleven (11) consecutive days beginning on December 22 nd and continuing through January 1st to the extent not already covered in the foregoing clause (a) or (b).

1.20 "**Calendar Quarter**" means the period beginning on the Effective Date and ending on the last day of the calendar quarter in which the Effective Date falls, and thereafter each successive period of three (3) consecutive calendar months ending on March 31, June 30, September 30 or December 31; provided that the final Calendar Quarter shall end on the last day of the Term.

1.21 "**Calendar Year**" means the period beginning on the Effective Date and ending on December 31 of the calendar year in which the Effective Date falls, and thereafter each successive period of twelve (12) months commencing on January 1 and ending on December 31; provided that the final Calendar Year shall end on the last day of the Term.

1.22 "**Candidate Selection Criteria**" means the criteria attached hereto as Schedule 1.22 as may be amended by the JRC from time-to-time.

1.23 "**cGAS**" means cyclic GMP-AMP synthase, a cytosolic DNA sensor that synthesizes cyclic GMP-AMP and activates the type I interferon pathway.

1.24 "**cGAS/STING Assessment**" means, with respect to (a) the targeting of cGAS, that a given Potential Collaboration Compound demonstrates activity at **[***]** or (b) the binding of a given Potential Collaboration Compound to STING with **[***]**, in each case of (a) or (b), as the applicable assay to determine activity or binding specificity is specified in greater detail in the Research Plan.

1.25 "**cGAS/STING Compound**" is defined in Section 4.2.1.

1.26 "**Change of Control**" means, with respect to a Party, (a) a merger or consolidation of such Party with a Third Party that results in the voting securities of such Party outstanding immediately prior thereto, or any securities into which such voting securities have been converted or exchanged, ceasing to represent at least fifty percent (50%) of the combined voting power of the surviving entity or the parent of the surviving entity immediately after such merger or consolidation, (b) a transaction or series of related transactions in which a Third Party, together

with its Affiliates, becomes the beneficial owner of fifty percent (50%) or more of the combined voting power of the outstanding securities of such Party or (c) the sale or other transfer to a Third Party of all or substantially all of such Party's assets or all or substantially all of such Party's assets to which this Agreement relates.

1.27 "**Claim**" means an Aduro Indemnity Claim or a Lilly Indemnity Claim, as applicable.

1.28 "**Clinical Trial**" means a Phase I Clinical Trial, a Phase II Clinical Trial, a Pivotal Trial, or a combination of two (2) or more of the foregoing.

1.29 "**Co-Funding Option**" is defined in Section 5.4.2.

1.30 "**Collaboration Compound**" means (i) any cGAS/STING Compound that is identified in accordance with the process set forth in Section 4.2, or (ii) any compound **[***]** Collaboration Target that the Parties have agreed to add to this Agreement in accordance with Section 1.31 and for which the JRC has approved a revised process analogous to that set forth in Section 4.2.

1.31 "**Collaboration Target**" means, as applicable, (i) cGAS, (ii) STING, (iii) any other target mutually agreed by the Parties in writing, or (iv) a multi-specific target combination of two (2) or more of the foregoing. The Parties acknowledge and agree that if one or more additional targets is approved by the Parties, then the Parties will redefine "cGAS/STING Assessment" and as applicable, "[***]", accordingly.

1.32 "**Combination Product**" is defined in Section 1.108.

1.33 "**Commercialization**" or "**Commercialize**" means any and all activities directed to the offering for sale and sale of a product including activities directed to marketing, promoting, detailing, distributing, importing, selling and offering to sell that product, and seeking pricing approvals and reimbursement approvals (in each case, as and to the extent applicable) for that product, and interacting with Regulatory Authorities regarding the foregoing. When used as a verb, "to **Commercialize**" and "**Commercializing**" means to engage in Commercialization and "**Commercialized**" has a corresponding meaning.

1.34 "**Commercially Reasonable Efforts**" means, with respect to a Party, the effort, expertise and resources normally used by the Party in the development or commercialization of a comparable pharmaceutical product controlled by such Party which is of similar market potential at a similar stage of development or commercialization in light of issues of safety and efficacy, product profile, the competitiveness of the marketplace, the proprietary position of the compound, platform, or product, the regulatory structure involved, the profitability of the applicable products, product reimbursement and other relevant strategic and commercial factors normally considered by the Party in making product portfolio decisions. For purposes of clarity, Commercially Reasonable Efforts will be determined on an Indication-by-Indication (if needed) and country-by-country basis within the Territory, and it is anticipated that the level of effort may be different for different Indications and countries and may change over time, reflecting changes in the status of the Product and the Indications and country(ies) involved.

1.35 "**Competing Acquirer**" is defined in Section 15.10.3.

1.36 "**Competing Acquisition**" is defined in Section 15.10.3.

1.37 "**Competing Generic**" means, with respect to a given Product and a given country in the Territory, a product sold by a Third Party in such country, other than as a Sublicensee of Lilly or its Affiliates under this Agreement, that (a) receives Marketing Authorization as a generic, follow-on, hybrid, or interchangeable product of such Product from the applicable Regulatory Authority in such country by referencing the Drug Approval Application (or data therein) for the Product or (b) which is approved under an abbreviated pathway under the FDCA or similar legislation in the relevant country. For purposes of this Agreement, Competing Generic in the United States means a product sold by a Third Party in such country, other than as a Sublicensee of Lilly or its Affiliates under this Agreement, that (i) receives approval under an abbreviated new drug application ("ANDA") referencing Product], or (ii) receives approval through an FDCA section 505(b)(2) application referencing Product and is determined by the FDA to be therapeutically equivalent to Product as documented in FDA's *Approved Drug Products with Therapeutic Equivalence Evaluations* publication (the "Orange Book"), or (iii) receives approval through a process that does not exist as of the Effective Date but that satisfies the first sentence of this Section 1.37.

1.38 "**Competing Product**" means any product (other than a Product) that includes a component that **[***]** Collaboration Target, thereby having the **[***]** whether alone or in combination with one or more therapeutic or active agents.

1.39 "[***]" is defined in Section 15.10.3(a).

1.40 "**Compliance**" shall mean the adherence by the Parties in all material respects to all Applicable Laws and Party Specific Regulations, in each case with respect to the activities to be conducted under this Agreement.

1.41 "**Confidential Information"** means (a) with respect to Aduro, all information, including Aduro Know-How and Aduro's Proprietary Materials; and (b) with respect to Lilly, all information, including Lilly Know-How and Lilly's Proprietary Materials, that are, in either case, disclosed or provided by or on behalf of a Party (the "**Disclosing Party**") to the other Party (the "**Receiving Party**") or to any of the employees, directors or agents of, or consultants to, the Receiving Party; provided that none of the foregoing shall be deemed Confidential Information if: (i) as of the date of disclosure, it is known to the Receiving Party or its Affiliates as demonstrated by contemporaneous credible written documentation, other than by virtue of a prior confidential disclosure to such Receiving Party; (ii) as of the date of disclosure it is in the public domain, or it subsequently enters the public domain through no fault of the Receiving Party; (iii) it is obtained by the Receiving Party from a Third Party having a lawful right to make such disclosure free from any obligation of confidentiality to the Disclosing Party of which the Receiving Party should be reasonably aware; or (iv) it is independently developed by or for the Receiving Party without reference to or use of any Confidential Information of the Disclosing Party as demonstrated by contemporaneous credible written documentation. For clarity, any combination of Confidential Information shall not be considered in the public domain or in the possession of the Receiving Party merely because individual elements of such Confidential Information are in the public

domain or in the possession of the Receiving Party unless the combination and its principles are in the public domain or in the possession of the Receiving Party. Notwithstanding anything herein to the contrary, (A) the terms of this Agreement shall constitute Confidential Information of each Party, and (B) [***].

1.42 "**Content**" is defined in Section 9.2.1.

1.43 "**Control**" or "**Controlled**" means (a) with respect to Know-How or Patent Rights, the possession by a Party of the right to grant a license or sublicense to such Know-How or Patent Rights as provided herein without violating the terms of any agreement or arrangement with any Third Party, and without violating any Applicable Laws and (b) with respect to Proprietary Materials, the possession by a Party of the right to supply such Proprietary Materials to the other Party as provided herein without violating the terms of any agreement or arrangement with any Third Party, and without violating any Applicable Laws.

1.44 "**Cover**" or "**Covered**" means, with respect to a Product or component thereof, that the manufacture, use, offer for sale, sale, import or export of such Product or component thereof in a particular country by an unlicensed Third Party would infringe a Valid Claim.

1.45 "**CTA**" means: (a) a clinical trial application or any successor application or procedure required to initiate clinical testing of a Product in humans in the Territory and (b) all supplements and amendments to any of the foregoing.

1.46 "**Deliberation Period**" is defined in Section 4.3.1.

1.47 "**Development**" or "**Develop**" means, with respect to a product, all product development activities commencing with an IND filing (*i.e.*, following the conclusion of Research), including the performance of Clinical Trials with respect to that product, and the preparation and filing of Regulatory Filings and all regulatory affairs related to the foregoing. For clarity, "Development" does not include activities that are Aduro Research Activities. When used as a verb, "**Developing**" means to engage in Development and "**Developed**" has a corresponding meaning. For clarity, "**Development**" shall not include any Research or Commercialization activities.

1.48 "**Development Costs**" means all internal and external costs and expenses incurred by a Party or its Affiliates (including, without replication, the cost of allocated FTEs at the FTE Rate) in Developing the Products, in each case to the extent incurred in accordance with this Agreement and with U.S. GAAP generally and consistently applied. For clarity, Development Costs include, as applicable, **[***]**.

1.49 "**Disclosing Party**" is defined in Section 1.41.

1.50 "**Disputed Matter**" is defined in Section 3.7.1.

1.51 "**DMF**" means a Drug Master File maintained with a Regulatory Authority in any country within the Territory.

1.52 "**Drug Approval Application**" means, with respect to a Product in any country in the Territory, an application for Marketing Authorization for such Product in such country, including an NDA or supplemental NDA (or the equivalent filing(s) outside of the United States) in any country in the Territory and all renewals, supplements and amendments to any of the foregoing.

1.53 "**Effective Date**" is defined in the Preamble.

1.54 "**Eli Lilly and Company Animal Care and Use Requirement for Animal Researchers and Suppliers**" means the guidelines relating to animal care and use for research done on behalf of Lilly and set forth in Schedule 1.54.

1.55 "**EMA**" means the European Medicines Agency or any successor agency or authority thereto.

1.56 "**European Union**" or "**EU**" means the countries of the European Union as constituted on the Effective Date (including the United Kingdom).

1.57 "**Excluded Compound**" is defined in Section 4.2.2.

1.58 "**Exclusivity Term**" means the Initial Exclusivity Term and any extended exclusivity period under Section 2.3.2(b).

1.59 "**Executive Officers**" means for Aduro, the President of Aduro, and for Lilly, prior to the first dosing of a patient in a Pivotal Trial, the President of Lilly Research, and following the first dosing of a patient in a Pivotal Trial, the President of Lilly's Bio Medicines Business Unit, or such other employee of Lilly as Lilly's Executive Officer designates.

1.60 "**Exercise Period**" is defined in Section 5.4.2.

1.61 "**Extension Period**" is defined in Section 4.1.4(d).

1.62 "**FDA**" means the United States Food and Drug Administration, or any successor agency or authority thereto.

1.63 "**FDCA**" means the United States Federal Food, Drug, and Cosmetic Act, as amended.

1.64 "**Field**" means, the diagnosis, prevention, control, treatment or amelioration, in humans and other animals, of all diseases or conditions, other than an Oncology Indication, whose treatment **[***]**, including (a) autoimmune diseases or conditions caused by excess inflammation, (b) autoimmune diseases or conditions caused by chronic inflammation, and (c) any other diseases or conditions that will benefit from **[***]**, including rheumatoid arthritis, lupus, psoriasis, atopic dermatitis, inflammatory bowel disease (IBD), type 1 diabetes, cardiovascular and neuroinflammatory diseases (*e.g.*, Alzheimer's disease, multiple sclerosis).

1.65 "**First Commercial Sale**" means, with respect to any Product in any country in the Territory, the date of the first sale, transfer or disposition by Lilly, an Affiliate of Lilly or Sublicensee, to a Third Party in that country after Marketing Authorization for the Product has been received in that country; provided that the following shall not constitute a First Commercial Sale: (a) any sale, transfer or disposition of a Product at no more than a *de minimis* charge for academic research, preclinical, clinical, or regulatory purposes; (b) any sale, transfer or disposition of a Product in connection with any patient assistance programs or for a bona fide charitable purpose, including compassionate use or "named patient sales" or to physicians or hospitals for promotional purposes (including free samples to a level and in an amount which is customary in the industry or which is reasonably proportional to the market for such Product); or (c) any sale, transfer or disposition of a Product for use in Clinical Trials, pre-clinical studies or other Research or Development activities. "**First Commercially Sold**" shall have correlative meaning. For purposes of the definition of "Baseline Quarter Volume" only, these definitions shall apply to a Competing Generic as if it were a Product under this Section 1.65 (and subject to adjusting the references from "Lilly" to the applicable Third Party), *mutatis mutandis*.

1.66 "**Force Majeure**" means any occurrence beyond the reasonable control of a Party that prevents or substantially interferes with the performance by such Party of any of its obligations hereunder, including by reason of any act of God, flood, fire, explosion, earthquake, casualty or accident, or war, revolution, civil commotion, act of terrorism, blockage or embargo, or any injunction, law, order, proclamation, regulation, ordinance, demand or requirement of any government or of any subdivision, authority or representative of any such government.

1.67 "**FTE**" means, with respect to an individual, the equivalent of the work of one (1) employee (which might include temporary contract workers) of the total work force being utilized by a Party to perform its obligations under the Agreement) working full time under this Agreement for one (1) Calendar Year (consisting of at least a total of **[***]** hours per year (excluding vacations and holidays)). Overtime, and work on weekends, holidays and the like (collectively or individually, the "Overtime Work") will not be counted with any multiplier (*e.g.*, time-and-a-half or double time) toward the number of hours that are used to calculate the FTE contribution, and such Overtime Work will not be considered at all for any employees paid on a salaried basis. One FTE may constitute work performed by an individual whose time is dedicated solely to an individual development activity hereunder, or may comprise the efforts of several individuals, each of whom dedicates only part of his or her time to work on an individual development activity hereunder. In no event shall a single individual account for more than one full FTE (*i.e.*, 1.0 FTE) in any Calendar Year, whether dedicated solely to activities under this Agreement or in part to activities under this Agreement and in part to activities outside of this Agreement.

1.68 "**FTE Costs**" means the applicable number of FTE hours multiplied by the FTE Rate.

1.69 "**FTE Rate**" means, for the period commencing on the Effective Date until such time as the Parties agree otherwise, **[***]** U.S. dollars ($**[***]**) per FTE. The FTE Rate is assumed to be a fully burdened rate and includes costs of salaries, benefits, standard or ordinary course supplies, travel, other employee costs, and supporting general and administration allocations for the specific, relevant, activities contemplated under this Agreement, but does not include a margin or mark-up on such amounts.

1.70 "**Good Clinical Practice**" or "**GCP**" means the then-current good clinical practice applicable to the clinical Development of any Product under Applicable Laws, including the ICH guidelines and U.S. Good Clinical Practice.

1.71 "**Good Laboratory Practice**" or "**GLP**" means the then-current standards for laboratory activities for pharmaceuticals, as set forth in the FDA's Good Laboratory Practice regulations as defined in 21 C.F.R. Part 58 or the Good Laboratory Practice principles of the Organization for Economic Co-Operation and Development ("**OECD**"), and such standards of good laboratory practice as are required by the European Union and other organizations and governmental agencies in countries in which a Product is intended to be sold, to the extent such standards are not less stringent than United States Good Laboratory Practice.

1.72 "**Good Manufacturing Practice**" or "**GMP**" means the then-current Good Manufacturing Practices that apply to the manufacture (including clinical or commercial supply) of any product, including, as applicable to Product, the United States regulations set forth under Title 21 of the United States Code of Federal Regulations, parts 4, 210, 211 and 820, as may be amended from time-to-time, as well as all applicable guidance published from time-to-time by the FDA and the International Conference on Harmonisation Guidelines ICH Q7A Good Manufacturing Practice Guidance for the principles, guidelines of Good Manufacturing Practices for Medicinal Products as defined with EC Directive 2003/94/EC and associated EC Guide to Good Manufacturing Practice.

1.73 "**Good Research Practices**" or "**GRP**" means all applicable current Good Research Practices including, as applicable, (a) the research quality standards defining how Lilly's research laboratories conduct good science for non-regulated work as set forth in Schedule 1.73 (*i.e.*, the "Eli Lilly and Company Good Research Practices"), (b) the Research Quality Association (RQA), 2014, Quality in Research Guidelines for Working in Non-Regulated Research, (c) the WHO Quality Practices in Basic Biomedical Research Guidelines and (d) the equivalent Applicable Laws if any, in any relevant country.

1.74 "**Government Official**" means: (a) any officer or employee of (i) a government, or any department or agency thereof, (ii) a government-owned or controlled company, institution, or other entity, including a government-owned hospital or university or (iii) a public international organization (such as the United Nations, the International Monetary Fund, the International Committee of the Red Cross, and the World Health Organization), or any department or agency thereof; (b) any political party or party official or candidate for public or political party office; or (c) any person acting in an official capacity on behalf of any of the foregoing.

1.75 "**Governmental Authority**" means any multi-national, federal, state, local, municipal, provincial or other governmental authority of any nature (including any governmental division, prefecture, subdivision, department, agency, bureau, branch, office, commission, council, court or other tribunal).

1.76 "**ICH**" is defined in Section 4.4.1.

1.77 "**IND**" means (a) an Investigational New Drug Application, as defined in the FDCA and regulations promulgated thereunder, or any successor application or procedure required to initiate clinical testing of a Product in humans in the United States; (b) a counterpart of an Investigational New Drug Application that is required in any other country or region in the Territory before beginning clinical testing of any Product in humans in such country or region; and (c) all supplements and amendments to any of the foregoing.

1.78 "**Indemnified Party**" is defined in Section 14.3.

1.79 "**Indemnifying Party**" is defined in Section 14.3.

1.80 "**Indication**" means any indication, disease or condition, which can be treated, prevented, cured or the progression of which can be delayed. For clarity, distinctions between human indications, diseases or conditions with respect to a Product shall be made by reference to the World Health Organization International Classification of Diseases, version 10 (as revised and updated).

1.81 "**Infringement**" is defined in Section 11.2.1(a)(i).

1.82 "**Infringement Notice**" is defined in Section 11.2.1(a)(i).

1.83 "**Infringement Response**" is defined in Section 11.2.1(a)(ii).

1.84 "**Initial Exclusivity Term**" is defined in Section 2.3.2(a).

1.85 "**Internal Compliance Codes**" shall mean a Party's internal policies and procedures intended to ensure that a Party complies with Applicable Laws, Party Specific Regulations, and such Party's internal ethical, medical and similar standards.

1.86 "**Inventions**" means all inventions, whether or not patentable, that are discovered, made, conceived of, or reduced to practice in the performance of activities hereunder with respect to any Collaboration Compound or Product or any component thereof.

1.87 "**Joint Know-How**" means Jointly-Owned Collaboration IP which is Know-How.

1.88 "**Joint Patent Rights**" means Jointly-Owned Collaboration IP which is Patent Rights.

1.89 "**Jointly-Owned Collaboration IP**" is defined in Section 10.2.3(a).

1.90 "**JRC**" is defined in Section 3.2.

1.91 "**Know-How**" means, collectively, inventions, discoveries, improvements, trade secrets and proprietary methods, whether or not patentable, including: (a) methods of manufacture or use of, and structural and functional information pertaining to, chemical compounds and materials and (b) compositions of matter, data, formulations, processes, techniques, protocols, assays, know-how and results, including preclinical, pharmaceutical, toxicological and clinical data.

1.92 "**Lead Candidate**" means: (a) a Collaboration Compound that (i) [***], or (ii) [***]; or (b) any **[***]**.

1.93 "**Lead Selection Criteria**" means the criteria attached hereto as Schedule 1.93 as may be amended by the JRC from time-to-time.

1.94 "**Lilly**" is defined in the Preamble.

1.95 "**Lilly Collaboration IP**" is defined in Section 10.2.1(a).

1.96 "**Lilly Compound**" is defined in Section 12.3.5.

1.97 "**Lilly Indemnitees**" is defined in Section 14.2.

1.98 "**Lilly Indemnity Claims**" is defined in Section 14.2.

1.99 "**Lilly Know-How**" means any Know-How Controlled by Lilly or its Affiliates as of the Effective Date or during the Exclusivity Term that is necessary or reasonably useful for (a) the Research, Development, Manufacture, use, importation, or Commercialization (including offer for sale or sale) of a Collaboration Compound or Product or (b) the performance of the Research Activities; provided that "Lilly Know-How" does not include any Joint Know-How.

1.100 "**Lilly Patent Rights**" means any Patent Rights Controlled by Lilly or its Affiliates as of the Effective Date or during the Exclusivity Term, the practice of which is necessary or reasonably useful for (a) the Research, Development, Manufacture, use, importation, or Commercialization (including offer for sale or sale) of a Collaboration Compound or Product or (b) the performance of the Research Activities; provided that "Lilly Patent Rights" do not include any Joint Patent Rights.

1.101 "**Lilly Research Activities**" is defined in Section 4.1.3(a).

1.102 "**Losses**" is defined in Section 14.1.

1.103 "**Major EU Markets**" means **[***]**.

1.104 "**Major Markets**" means **[***]**.

1.105 "**Manufacture**" means, with respect to any product, all activities related to the manufacture, processing, filling, finishing, packaging, labeling, release, shipping, holding, conduct of process development, process qualification and validation and scale-up of the process to manufacture any product or component thereof, and any analytic development and product characterization with respect thereto, stability testing, quality assurance and quality control of such product.

1.106 "**Marketing Authorization**" means, with respect to a product, the Regulatory Approval required by Applicable Laws to sell such product in a country or region in the Territory. For purposes of clarity, (a) "Marketing Authorization" in the **[***]** means **[***]**, (b) "Marketing Authorization" in the **[***]** means marketing authorization for such product granted **[***]**, (c) "Marketing Authorization" in **[***]** means marketing authorization for such product granted by **[***]**, and (d) with respect to each of the foregoing jurisdictions listed in the foregoing clauses (a) – (c), "Marketing Authorization" also means marketing authorization or approval through a process that does not exist as of the Effective Date but that satisfies the first sentence of this Section 1.106.

1.107 "**NDA**" means a New Drug Application, as defined in the FDCA and regulations promulgated thereunder, or any successor application or procedure required to sell the Product in the United States.

1.108 "**Net Sales**" means, with respect to a particular Product, the gross amount invoiced by Lilly (including any Affiliate of Lilly) or any Sublicensee thereof to unrelated Third Parties, excluding any Sublicensee (except where the Sublicensee is the end user of such Product), for such Product in the Territory, less:

(a) Trade, quantity and cash discounts allowed for such Product;

(b) Discounts, refunds, rebates, chargebacks, retroactive price adjustments, and any other allowances which effectively reduce the net selling price of such Product;

(c) Returns and allowances of such Product;

(d) [***];

(e) [***];

(f) [***]; and

(g) Any other similar and customary deductions in accordance with U.S. GAAP.

Such amounts shall be determined from the books and records of Lilly or Sublicensee maintained in accordance with U.S. GAAP or, in the case of Sublicensees, such similar accounting principles, consistently applied. Lilly further agrees in determining such amounts, it will use Lilly's then current standard procedures and methodology, including Lilly's then current standard exchange rate methodology for the translation of foreign currency sales into U.S. dollars or, in the case of Sublicensees, such similar methodology, consistently applied.

In the event that the Product is sold as part of a Combination Product (where "**Combination Product**" means any pharmaceutical product which comprises the Product and a non-Collaboration Compound active compound(s) and/or active ingredients), the Net Sales of such Product, for the purposes of determining royalty payments, shall be determined by multiplying the Net Sales of the Combination Product by the fraction, A / (A+B), where A is the weighted average sale price of the Product when sold separately for the same dosage as contained in the Combination Product in finished form, and B is the weighted average sale price of the other product(s) sold separately in finished form.

In the event that the weighted average sale price of the Product can be determined, but the weighted average sale price of the other product(s) cannot be determined, Net Sales for purposes of determining royalty payments shall be calculated by multiplying the Net Sales of the Combination Product by the fraction A / C where A is the weighted average sale price of the Product when sold separately in finished form and C is the weighted average sale price of the Combination Product.

In the event that the weighted average sale price of the other product(s) can be determined, but the weighted average sale price of the Product cannot be determined, Net Sales for purposes of determining royalty payments shall be calculated by multiplying the Net Sales of the Combination Product by the following formula: one (1) minus (B / C) where B is the weighted average sale price of the other product(s) when sold separately in finished form and C is the weighted average sale price of the Combination Product.

In the event that the weighted average sale price of both the Product and the other product(s) in the Combination Product cannot be determined, the Net Sales of the Product shall be deemed to be equal to **[***]** of the Net Sales of the Combination Product.

The weighted average sale price for a Product, other product, or Combination Product shall be calculated once each Calendar Year and such price shall be used during all applicable royalty reporting periods for the entire following Calendar Year. When determining the weighted average sale price of a Product, other product or Combination Product, the weighted average sale price shall be calculated by dividing the sales dollars (translated into U.S. dollars) by the units of active ingredient sold during the **[***]** months (or the number of months sold in a partial Calendar Year) of the preceding Calendar Year for the respective Product, other product or Combination Product. In the initial Calendar Year, a forecasted weighted average sale price will be used for the Product, other products or Combination Product. Any over or under payment in the initial year due to a difference between forecasted and actual weighted average sale prices will be paid or credited in the first royalty payment of the following Calendar Year.

1.109 "**OECD**" is defined in Section 1.71.

1.110 "**Oncology Indications**" means a clinical indication for the [***].

1.111 "**Orange Book**" is defined in Section 1.37.

1.112 "**Overtime Work**" is defined in Section 1.67.

1.113 "**Party**" and "**Parties**" are defined in the Preamble.

1.114 "**Party Specific Regulations**" means all judgments, decrees, orders or similar decisions issued by any Governmental Authority specific to a Party, and all consent decrees, corporate integrity agreements, or other agreements or undertakings of any kind by a Party with any Governmental Authority, in each case as the same may be in effect from time to time and applicable to a Party's activities contemplated by this Agreement.

1.115 "**Patent Costs**" means the costs and expenses incurred by a Party (including reasonable external attorneys' fees) in the conduct of Patent Prosecution or Patent Defense activities, as the case may be, for which that Party is responsible in accordance with this Agreement.

1.116 "**Patent Defense**" means the responsibility for defending any interference, declaratory judgment action, opposition, *inter partes* review, re-examination or similar action or proceeding alleging the invalidity, unenforceability or non-infringement of any Patent Right.

1.117 "**Patent Prosecution**" means the responsibility for preparing, filing and prosecuting patent applications (of all types) for any Patent Rights, and for maintaining any Patent Rights.

1.118 "**Patent Rights**" means the rights and interests in and to issued patents and pending patent applications (which, for purposes of this Agreement, include certificates of invention, applications for certificates of invention and priority rights) in any country or region, including all provisional applications, substitutions, continuations, continuations-in-part, divisions, renewals, all letters patent granted thereon, and all reissues, re-examinations and extensions thereof, and all foreign counterparts of any of the foregoing.

1.119 "**PDF**" is defined in Section 15.7.

1.120 "**Person**" means an individual, sole proprietorship, partnership, limited partnership, limited liability partnership, corporation, limited liability company, business trust, joint stock company, trust, incorporated association, joint venture or similar entity or organization, including a government or political subdivision, department or agency of a government.

1.121 "**Phase I Clinical Trial**" means a human clinical trial for a product in any country that satisfies the requirements of 21 C.F.R. § 312.21(a) (or its successor regulation or its equivalent in any other jurisdiction) and is designed to assess the safety of such product in patients.

1.122 "**Phase II Clinical Trial**" means a human clinical trial for a product in any country that satisfies the requirements of 21 C.F.R. § 312.21(b) (or its successor regulation or its equivalent in any other jurisdiction) and is intended to explore one or more doses, dose response, and duration of effect, and to generate initial evidence of clinical activity and safety, in the target patient population.

1.123 "**Pivotal Trial**" means a human clinical trial that (a) if the defined endpoints for such trial are met, is intended to be a pivotal trial for purposes of obtaining Regulatory Approvals and (b) satisfies the requirements of 21 C.F.R. § 312.21(c) (or its successor regulation or its equivalent in any other jurisdiction).

1.124 "**Potential Collaboration Compound**" means (a) the compounds listed on Schedule 1.124, (b) any **[***]** and (c) **[***]**. For clarity, if a Potential Collaboration Compound is subsequently determined to be an Excluded Compound in accordance with Section 4.2, such compound is no longer a Potential Collaboration Compound.

1.125 "**Product**" means any pharmaceutical preparation or other product formulation containing or comprising one or more Collaboration Compounds, any of which or both of which are, alone or in combination with one or more therapeutic or active agents (other than any non-Collaboration Compound active ingredient owned or controlled by Aduro or its Affiliates), intended for use in the Field.

1.126 "[***]" is defined in Section 1.41.

1.127 "**Product Patent Rights**" means any Aduro Patent Rights, Lilly Patent Rights, or Joint Patent Rights that claim the composition of matter of a Product.

1.128 "**Proposed Terms**" is defined in Schedule 12.3.

1.129 "**Proprietary Materials**" means: (a) any tangible chemical, biological or physical materials that are Controlled and furnished by the Transferring Party to the Recipient Party, whether or not specifically designated as proprietary by the Transferring Party; or (b) any tangible chemical, biological or physical materials that are generated, conceived or reduced to practice in the conduct of the Research Plan; provided that "Proprietary Materials" do not include any Product.

1.130 "**Publication**" is defined in Section 9.2.2.

1.131 "**Receiving Party**" is defined in Section 1.41.

1.132 "**Recipient Party**" is defined in Section 9.4.

1.133 "**Recovery**" is defined in Section 11.2.1(c).

1.134 "**Regulatory Approval**" means, with respect to any country or region in the Territory, any approval, establishment license, registration or authorization of any Regulatory Authority required for the manufacture, use, storage, importation, exportation, transport or distribution of product for use in such country or region.

1.135 "**Regulatory Authority**" means any national, international, regional, state or local regulatory agency, department, bureau, commission, council or other governmental entity with authority over the distribution, importation, exportation, manufacture, use, storage, transport, clinical testing, pricing, sale or reimbursement of pharmaceutical products in the Territory.

1.136 "**Regulatory Filing**" means, collectively: (a) any IND, CTA, Drug Approval Application, establishment license application, DMF, application for designation as an "Orphan Drug" under the Orphan Drug Act, for "Fast Track" status under Section 506 of the FDCA (21 U.S.C. § 356) or for a Special Protocol Assessment under Section 505(b)(4)(B) and (C) of the FDCA (21 U.S.C. § 355(b)(4)(B)) and all other similar filings (including counterparts of any of the foregoing in any country or region in the Territory); (b) all supplements and amendments to any of the foregoing; and (c) all data and other information contained in, and correspondence relating to, any of the foregoing.

1.137 "**Requesting Party**" is defined in Section 9.2.1.

1.138 "**Research**" means, with respect to a compound, research activities prior to an IND filing (*i.e.*, prior to commencing Development).

1.139 "**Research Activities**" means Aduro Research Activities and Lilly Research Activities, collectively.

1.140 "**Research Data**" means all results, data, and analyses thereof generated in the conduct of the Research Plan.

1.141 "**Research Plan**" means the plan pursuant to which the Parties shall pursue certain Research Activities as more specifically outlined in the initial Research Plan attached as Schedule 1.141, and which shall include a budget for all such Research Activities, and as may be amended from time to time in accordance with Article 4.

1.142 "**Research Term**" means the period commencing on the Effective Date and continuing until **[***]**, subject to extension in accordance with Section 4.1.4(d).

1.143 "**Researchers**" is defined in Schedule 1.54.

1.144 "**Reviewing Party**" is defined in Section 9.2.1.

1.145 "**Royalty Term**" means with respect to a Product in the Territory, on a country-by-country basis, the period beginning on the date of First Commercial Sale of such Product in a country and ending on the latest of (a) the expiration of the last-to-expire Valid Claim of an Aduro Patent Right, Lilly Patent Right or a Joint Patent Right in such country **[***]**, (b) **[***]** from the date of the First Commercial Sale of such Product in such country, and (c) expiration of any data exclusivity period in such country.

1.146 "**Selected Candidate**" means (a) a Lead Candidate that (i) [***] or (ii) [***] or (b) any **[***]**.

1.147 "**Serious Adverse Event**" means any untoward medical occurrence with respect to any Product that, at any dose, results in death, is life-threatening, requires inpatient hospitalization or prolongation of existing hospitalization, results in persistent or significant disability/incapacity, or is a congenital anomaly/birth defect, as defined more fully in 21 C.F.R. § 312.32.

1.148 "**STING**" means stimulator of interferon genes (also known as TMEM173), which is [***] to induce type I interferon responses.

1.149 "**Sublicensee**" means any Third Party to which Lilly grants a sublicense in accordance with Section 2.1.3.

1.150 "**Suppliers**" is defined in Schedule 1.54.

1.151 "**Support Memorandum**" is defined in Schedule 12.3.

1.152 "**Term**" is defined in Section 12.1.

1.153 "**Termination IP**" means all (a) Patent Rights that Lilly Controls as of the effective date of termination that are necessary for the Research, Development, Manufacture, use, importation, or Commercialization of the Termination Products and (b) Know-How that Lilly Controls as of the effective date of termination that Lilly is using or has used (and, in the case of "has used", is determined to be necessary) for the Research, Development, Manufacture, use, importation, or Commercialization of the Termination Products; provided that **[***]**.

1.154 "**Termination Products**" means, in the event of a termination of this Agreement in its entirety, all Collaboration Compounds and/or Products that are being Developed or Commercialized by Lilly as of the effective date of termination (and in the form, and through the Manufacturing process, then being used by Lilly) and, in the event of a termination of this Agreement on a per-Product basis, the specific Product being terminated (and in the form, and through the Manufacturing process, then being used by Lilly). For clarity, **[***]**.

1.155 "**Territory**" means every country or territory in the world.

1.156 "**Third Party**" means a Person other than Lilly and Aduro and their respective Affiliates.

1.157 "**Third Party License**" is defined in Section 8.3.2(b).

1.158 "**Third Party Payments**" is defined in Section 8.3.2(b).

1.159 "**Transferring Party**" is defined in Section 9.4.

1.160 "[***]" means, with respect a cGAS/STING Compound, (a) a **[***]**, (b) a **[***]**, or (c) another effect reasonably deemed to be a surrogate of the foregoing clause (a) or (b) by the JRC.

1.161 "**United States**" or "**U.S.**" means the United States of America and its territories and possessions.

1.162 "**U.S. GAAP**" means U.S. Generally Accepted Accounting Principles.

1.163 "**Valid Claim**" means any claim of (a) an issued unexpired United States or foreign patent that has not been revoked or found to be unpatentable, invalid or unenforceable by a court or other government agency of competent jurisdiction, or (b) a United States or foreign patent application that has not been cancelled, withdrawn, or abandoned and has not been pending for more than **[***]** (**[***]**) years from the date of filing of the earliest priority patent application.

2. GRANT OF LICENSES; EXCLUSIVITY

2.1 **Grant of Rights to Lilly**.

2.1.1 Grant of License. Subject to the terms and conditions of this Agreement and Aduro's receipt of the upfront fee in accordance with Section 8.1, Aduro hereby grants Lilly an exclusive license, including the right to grant sublicenses as provided in Section 2.1.3, under the Aduro Patent Rights, the Aduro Know-How, the Aduro Collaboration IP, and Aduro's interest in the Jointly-Owned Collaboration IP to (a) Research, Develop, Manufacture or have Manufactured, use, Commercialize and otherwise fully exploit Products in the Territory in the Field or (b) perform the Lilly Research Activities. Notwithstanding the foregoing, the Parties acknowledge and agree that **[***]**; provided that **[***]**; provided, further, **[***]**. Furthermore, **[***]**. Lilly shall not **[***]**.

2.1.2 Retention of Rights. Notwithstanding the license granted in Section 2.1.1, Aduro retains the rights under the Aduro Patent Rights, the Aduro Know-How, the Aduro Collaboration IP, and Aduro's interest in the Jointly-Owned Collaboration IP as necessary to conduct the Aduro Research Activities and its other obligations under this Agreement.

2.1.3 Right to Sublicense. Lilly shall not grant sublicenses to a Third Party [***] (other than a sublicense to a contractor, supplier, or vendor) [***]**. [***]** Lilly shall have the right to grant sublicenses (through multiple tiers) under the license granted to it under Section 2.1.1 to any of its Affiliates and to any Third Party pursuant to a written agreement. (a) Any sublicense granted pursuant to this Section 2.1.3 shall obligate the Affiliate or Sublicensee (as applicable) to comply with all relevant restrictions, limitations and obligations in this Agreement including those relating to confidentiality, and shall be subject to the terms and conditions of this Agreement, (b) Lilly shall remain responsible to Aduro for the full and complete performance of its Sublicensee(s) and any Affiliate to which it grants a sublicense with respect to Lilly's obligations under the terms of this Agreement, including their compliance with the applicable terms and conditions of this Agreement, and (c) Lilly shall [***].

2.1.4 Aduro Covenant. Aduro covenants that, during the Term, it will not knowingly assign, transfer, convey or otherwise grant to any Person any rights to any Aduro Know-How and Aduro Patent Right (or any rights to any intellectual property that would otherwise be included in the Aduro Know-How or Aduro Patent Rights if not assigned, transferred, conveyed or otherwise granted to a Third Party), in any manner that is inconsistent with the exclusive license granted to Lilly pursuant to Section 2.1.1.

2.2 **Grant of Rights to Aduro**. Lilly hereby grants Aduro a limited, non-exclusive license, including the right to grant sublicenses upon written notice to Lilly and subject to Section 2.1.3 applied *mutatis mutandis* to Aduro and its sublicensees, under the Lilly Patent Rights, the Lilly Know-How, the Lilly Collaboration IP, and Lilly's interest in the Jointly-Owned Collaboration IP solely to conduct Aduro Research Activities hereunder in accordance with this Agreement; provided, however, that, **[***]** it shall **[***]**.

2.3 **Exclusivity**.

2.3.1 Field Exclusivity. Neither Party, absent the Parties' mutual written agreement, **[***]**. For clarity, each Party agrees, on its own behalf and on behalf of its Affiliates, not to (and shall cause its Affiliates not to) **[***]** with respect to **[***]** is permitted under this Agreement, but such other Party may not **[***]** (absent the Parties' mutual written agreement); provided that the results of such Research conducted during the Research Term **[***]** on a Calendar Quarter basis during the performance of such Research and will be deemed to be Jointly-Owned Collaboration IP created during the Research Activities except to the extent that any such results are subject to Section 10.2.1(a)(iii) or 10.2.2(a)(ii); provided, further, that **[***]**. In the event a Party desires to Develop or Commercialize **[***]**, prior to any Development or Commercialization thereof, (a) such Party shall **[***]** and (b) both Parties shall **[***]**. In addition, and without limiting the foregoing or any license grant to Lilly under Section 2.1, **[***]** may not (except as specifically permitted under this Agreement) (i) **[***]** or (ii) **[***]**, in each case (clauses (i) or (ii)), that **[***]**.

2.3.2 Aduro Exclusivity.

(a) *Initial Exclusivity Term*. During the Research Term and for a period of **[***]** (**[***]**) years thereafter (the "**Initial Exclusivity Term**"), except as expressly provided in this Agreement, Aduro and its Affiliates (subject to Section 4.1.2 and Section 15.10.3) shall not, **[***]**, nor **[***]**.

(b) *Extended Exclusivity*. Upon expiration of the Initial Exclusivity Term, and for the remainder of the Term, without limiting any license grant to Lilly under Section 2.1, except as expressly provided in this Agreement, Aduro and its Affiliates (subject to Section 4.1.2 and Section 15.10.3) shall not, **[***]** the **[***]** of which is targeted by:

(i) **[***]**, or

(ii) **[***]**.

(c) *Limitations on Exclusivity*. Aduro's and its Affiliates' obligations pursuant to Sections 2.3.2(a) and 2.3.2(b) shall terminate automatically on the date **[***]**, Lilly shall notify Aduro in writing **[***]** (**[***]**) [***] after any of the foregoing **[***]**.

(d) Notwithstanding anything to the contrary herein, Aduro will not (i) **[***]**, or (ii) **[***]**, in each case (clauses (i) or (ii)), **[***]**.

2.4 **Know-How Sharing; Cooperation**.

2.4.1 By Aduro. Upon Lilly's reasonable request, Aduro shall disclose or deliver to Lilly copies of the physical embodiments of the Aduro Know-How existing as of such time (and will use reasonable efforts to obtain all data and information, including any such Aduro Know-How in the possession of Aduro's contract researchers) related to the Development and Commercialization of Products to the extent necessary or useful for Lilly's performance under this Agreement, including the assays and pre-clinical models that Aduro is to use in performing the Aduro Research Activities; provided that Aduro's provision of Potential Collaboration Compounds (as a precursor to becoming Collaboration Compounds) hereunder shall in all events be subject to the screening and selection process set forth in Section 4.2. Until the **[***]** (**[***]**) anniversary of the end of the Research Term, upon Lilly's reasonable request, Aduro will provide reasonable technical assistance to Lilly subject to reimbursement by Lilly of Aduro's **[***]** costs and expenses, and reasonably cooperate with Lilly in connection with the transfer and disclosure of such Aduro Know-How and the Development of any Products, including making its employees and non-employee consultants reasonably available to consult with Lilly on issues arising during Lilly's Development and in connection with any request related to a Product or its Development from any Regulatory Authority, including regulatory, scientific, technical and clinical testing issues.

2.4.2 By Lilly. Lilly shall disclose or deliver to Aduro copies of the physical embodiments of the Lilly Know-How existing as of such time (and will use reasonable efforts to obtain all data and information, including any such Lilly Know-How, in Lilly's contract researchers' possession) in order to facilitate the performance of the Aduro Research Activities; provided that [***].

2.5 **Retained Rights**. Except as expressly provided in this Agreement including the rights under this Article 2, neither Party shall be deemed to have granted the other Party (by implication, estoppel or otherwise) any right, title, license or other interest in or with respect to any intellectual Property Controlled by such Party. For the avoidance of doubt, (i) Aduro retains all rights under the Aduro Patent Rights, Aduro Know-How and Aduro Collaboration IP to Research, Develop, Commercialize and otherwise exploit products (other than Products) in any field throughout the world, (ii) Lilly retains all rights under the Lilly Patent Rights, Lilly Know-How and Lilly Collaboration IP to Research, Develop, Commercialize and otherwise exploit products in any field throughout the world; in each case subject to the restrictions set forth in Section 2.3; and (iii) each Party retains all rights that such Party may Control (including all Patent Rights and Know-How) in respect of, and as they apply to, Excluded Compounds and/or any non-Collaboration Compounds.

3. COLLABORATION; GOVERNANCE

3.1 **Collaboration Overview**. The Parties desire and intend to collaborate with respect to the Research of Products in the Field in the Territory, as and to the extent set forth in this Agreement.

3.2 **Establishment and Disbandment of Joint Research Committee**. Within thirty (30) days after the Effective Date, Aduro and Lilly shall establish a joint research committee (the "**JRC**"). The JRC shall have and perform the responsibilities set forth in this Article 3; provided that the JRC shall in no event have any authority to amend this Agreement. The term for the JRC shall commence as of the date upon which it is established and continue until [***], but shall be extended (i) automatically, as necessary for the JRC to make decisions in accordance with Section 3.4.2 [***] or such limited time thereafter as is described in Section 4.3.1 or 4.3.2, as applicable, or (ii) on written agreement of the Parties. From and after the expiration of the term of the JRC as described in the foregoing sentence, this Article 3 shall have no further force or effect, except for Section 3.7, which will continue in accordance with its terms.

3.3 **Membership**. Each Party shall designate in writing, in its sole discretion, [***] to represent it on the JRC. The JRC may change its size from time to time by mutual written consent of the Parties (which consent may be withheld by either Party at its sole discretion); provided that each Party shall have equal numbers of employees on the JRC at all times, and each Party may replace its representatives at any time upon written notice to the other Party. Each Party shall appoint one of its representatives to serve as a co-chairperson of the JRC.

3.4 **Meetings**.

3.4.1 Schedule of Meetings; Attendance. The JRC shall have regular meetings, taking into account, without limitation, the planning needs for the Research Plan and the responsibilities of the JRC. Special meetings of the JRC may be convened by any member upon not less than fifteen (15) Business Days' (or, if such meeting is proposed to be conducted by teleconference, upon not less than five (5) Business Days') written notice to the other members; provided that (a) notice of any special meeting may be waived at any time, either before or after the special meeting and (b) attendance of any member at a special meeting shall constitute a valid waiver of notice of such member. Each Party may invite representatives, presenters or experts of such Party or of its Affiliates as it determines is appropriate, subject to the other Party consenting to such attendance, which consent will not be unreasonably withheld, conditioned or delayed; provided that any such guest attendees (i) shall not vote or otherwise participate in the decision-making process of the JRC and (ii) are bound by obligations of confidentiality and non-disclosure consistent with Article 9.

3.4.2 Voting; Decisions. The goal of all decision making shall be to achieve consensus, and the JRC representatives shall cooperate with one another to achieve such consensus. At each JRC meeting, the representatives of a Party shall have one (1) collective vote on all matters before the JRC at such meeting. All decisions of the JRC shall be made by unanimous vote, subject to Section 3.7. The JRC may also act by written consent signed by at least one (1) member designated by each Party. Whenever any action by the JRC is called for hereunder during a time period in which the JRC is not scheduled to meet, the Parties may call a special meeting in order to enable the JRC to address, and if agreed, take, the action in the requested time period.

3.4.3 Meetings; Minutes.

(a) A quorum of the JRC shall exist whenever there is present at a meeting at least [***] representatives appointed by each Party; provided that a Party may waive such requirement in respect of its own attendance, in its sole discretion, in the event only [***] of such Party is available to meet. The JRC will meet once every Calendar Quarter, unless otherwise mutually agreed. Meetings of the JRC may be held in person at the respective offices by a Party (or at other locations identified by such Party as may be mutually agreeable to the JRC members) on an alternating basis or by teleconference or videoconference. Notwithstanding the foregoing, the JRC shall meet in person at least twice per year.

(b) With the sole exception of specific items of any JRC meeting minutes to which the JRC cannot agree and which are escalated as provided in Section 3.7, definitive minutes of all meetings of the JRC shall be finalized no later than thirty (30) Business Days after the meeting to which the minutes pertain, as follows:

(i) Within ten (10) Business Days after each JRC meeting, beginning with Aduro's Alliance Manager and alternating between the Alliance Managers of the Parties thereafter, the designated Alliance Manager shall prepare and distribute to all members of the JRC draft minutes of the meeting. Such minutes shall provide a description, in reasonable detail, of a list of any actions, decisions or determinations approved by the JRC and a list of any issues to be resolved by the Executive Officers.

(ii) The JRC members shall then have ten (10) Business Days after receiving such draft minutes to provide comments thereon to the Alliance Manager. Upon the expiration of such second ten (10) Business Day period, the co-chairpersons shall have an additional ten (10) Business Days to finalize the minutes. If no comments are received by the JRC co-chairpersons within the second ten (10) Business Day period, the minutes shall be deemed final.

(c) The JRC co-chairpersons shall each sign and date the final minutes. The signature of the JRC co-chairpersons upon the final minutes shall indicate each Party's assent to the minutes. If at any time during the preparation and finalization of JRC meeting minutes, the Parties do not agree on any issue with respect to the minutes, such issue shall be resolved by the Executive Officers (and without either Party having decision-making authority with respect thereto); provided that **[***]**. The decision resulting from this escalation process shall be recorded by the JRC in amended finalized minutes for said meeting and if no resolution can be reached, then the disagreement shall be reflected in the minutes accordingly.

3.4.4 Expenses. Aduro and Lilly shall each bear all expenses of their respective JRC representatives related to their participation on the JRC and attendance at JRC meetings.

3.5 **Responsibilities**. Subject to Section 3.7, the JRC responsibilities will include:

(a) [***]

(b) [***]

(c) [***]

(d) [***]

(e) [***]

(f) [***]

(g) [***]

(h) [***]

(i) [***]

(j) [***]

3.6 **Reports to JRC**. Each Party shall endeavor to, at least five (5) days prior to each meeting of the JRC, and otherwise each Party shall, at each meeting of the JRC, submit to the JRC a written status report summarizing the progress of its Research Activities, including pursuant to the Research Plan, during the period since the last meeting of the JRC. Each summary shall include a description of all material decisions and actions relating to the Research, or Development of, or filing of any Regulatory Filing for a Product, including summaries of resulting Research Data generated during such period. Notwithstanding the foregoing, this Section 3.6 is subject to Section 15.10.3(d).

3.7 **Committee Decisions**.

3.7.1 Disputed Matters. The JRC members shall use reasonable efforts in good faith to reach agreement on any and all matters within its responsibility. If, despite such reasonable efforts, agreement on a particular matter that is within the responsibility of the JRC cannot be reached by the JRC within fifteen (15) days after the JRC first meets to consider such matter or such later date as may be mutually acceptable to the Parties (each such matter, a "Disputed Matter"), the Parties shall refer such Disputed Matter to the Executive Officers of the Parties who shall promptly initiate discussions in good faith to resolve such Disputed Matter, and if not resolved by the Executive Officers within thirty (30) days from the date the Disputed Matter is first referred to the Executive Officers, then **[***]**.

3.7.2 Limitations. Neither Party shall have the right to exercise decision-making authority to unilaterally (a) amend, modify or waive compliance with the terms and conditions of this Agreement, or to interpret, alter, increase, expand, or waive compliance by a Party with, a Party's obligations under this Agreement or (b) to cause the other Party to perform any activities, or incur any material costs, that are not specified in this Agreement (including the last mutually agreed **[***]** Research Plan). For clarity, if any Disputed Matter involves a matter outside of the decision-making authority of the JRC, such Disputed Matter shall be resolved in accordance with Section 15.2 except as otherwise expressly set forth herein.

3.8 **Alliance Managers**. Each Party will appoint an individual designated as the alliance manager for all of the activities contemplated under this Agreement (the "**Alliance Manager**"). The Alliance Managers will attend each JRC meeting, and may be a member of the JRC (during the term of the JRC) and will be the main point of contact for each Party to exchange information, facilitate communication and coordinate the Parties' activities under this Agreement relating to Products and to provide support to the JRC and such other committees and working groups as the JRC may establish.

4. RESEARCH PLAN

4.1 Conduct of Research Plan

4.1.1 Research Plan. The Research Plan outlines the Research activities to be conducted by the Parties. The Research Plan in effect as of the Effective Date is attached hereto as Schedule 1.141. Amendments to the Research Plan may be proposed by either Party at any time and shall be subject to approval by the JRC.

4.1.2 Aduro Responsibilities.

(a) Aduro will be responsible for the Research activities assigned to it in the Research Plan (the "**Aduro Research Activities**").

(b) Aduro shall use Commercially Reasonable Efforts to perform the Aduro Research Activities during the Research Term as soon as practical (consistent with good scientific practice), and shall commit such resources (including employees, agents, consultants, facilities, equipment and materials) as are reasonably necessary to comply with such diligence obligation. Aduro shall make available to Lilly all results, data, and information arising from the Aduro Research Activities.

(c) Aduro shall be solely responsible for the safety and health of its employees, consultants and visitors, and for compliance with all Applicable Laws related to health, safety and the environment, including providing its employees, consultants and visitors with all required information and training concerning any potential hazards involved in performing such activities and any precautionary measures to protect its employees from any such hazards. Aduro shall train its personnel assigned to perform activities under this Agreement to ensure compliance with the Research Plan and ensure that any personnel so assigned shall be capable of professionally and competently performing the activities assigned to Aduro in each Research Plan.

4.1.3 Lilly Responsibilities.

(a) Subject to Sections 4.1.2 and 2.4, Lilly will be responsible for the Research activities assigned to it in the Research Plan and for all further Research and Development activities for the Products other than Aduro Research Activities (collectively, the "**Lilly Research Activities**"). For clarity, subject to Sections 4.1.2 and 2.4 and under any other written agreement between the Parties, Aduro shall have no obligation to assist in the Development of or fund any activities with respect to any Products other than as expressly provided under the Research Plan, unless mutually agreed by the Parties in writing.

(b) Lilly shall use Commercially Reasonable Efforts to perform the Lilly Research Activities during the Research Term as soon as practical (consistent with good scientific practice), and shall commit such resources (including employees, agents, consultants, facilities, equipment and materials) as are reasonably necessary to comply with such diligence obligation.

(c) Lilly shall be solely responsible for the safety and health of its employees, consultants and visitors, and for compliance with all Applicable Laws related to health, safety and the environment, including providing its employees, consultants and visitors with all required information and training concerning any potential hazards involved in performing such activities and any precautionary measures to protect its employees from any such hazards.

4.1.4 Costs of Research Activities.

(a) *Aduro Responsibilities*. Subject to Section 4.1.4(c), **[***]**.

(b) *Lilly Responsibilities*. **[***]**.

(c) *Lilly Funding Obligations*. Lilly will reimburse Aduro for [***] (including the budget set forth therein) and this Agreement [***] during the initial Research Term for up to a total amount of **[***]** dollars ($**[***]**); provided that Lilly will not be obligated to reimburse Aduro for (i) **[***]**, (ii) **[***]** and (iii) **[***]**. In the event Lilly exercises its option to extend the initial Research Term in accordance with Section 4.1.4(d), Lilly will reimburse Aduro for [***] Aduro will invoice Lilly in arrears on a Calendar Quarter basis for [***] and will provide reasonable supporting documentation with respect thereto, which invoice, to the extent undisputed, Lilly shall pay within **[***]** (**[***]**) days of receipt thereof. The Parties shall use good faith efforts to resolve all invoicing disputes promptly. Lilly will have the right to audit any such FTE Costs by way of Section 8.3.5 applied *mutatis mutandis* (with appropriate substitution/replacement of relevant Party and subject matter).

(d) *Extension Period.* Lilly shall have the right to extend the Research Term [***] for **[***]** (**[***]**) months each (each, an "**Extension Period**") upon written notice to Aduro (i) in the case of the first Extension Period, not less than **[***]** prior to the end of the initial Research Term, or (ii) in the case of the second Extension Period, not less than **[***]** prior to the end of the first Extension Period, in each case provided that Lilly reimburses Aduro in full for all FTE Costs in accordance with Section 4.1.4(c)*;* provided that an extension of the Research Term shall not be effective until (A) both Parties have agreed in a written amendment to this Agreement to the [***] for such extension, and (B) Aduro has confirmed in writing its ability to complete such Research Activities in accordance with the standards of this Agreement and [***]; provided, further, that **[***]**.

4.2 **Collaboration Compound Identification**.

4.2.1 **[***]** Without limiting the foregoing, **[***]** may still be deemed by the JRC to be a "cGAS/STING Compound".

4.2.2 All Potential Collaboration Compounds that do not **[***]** and, to the extent not otherwise deemed by the JRC to be a cGAS/STING Compound, shall be "**Excluded Compounds**" (unless otherwise determined to be cGAS/STING Compounds or Collaboration Compounds pursuant to the last sentence of this Section 4.2.2), and as provided further in Section 2.5, all intellectual property rights in and to any such Excluded Compounds shall remain with the Party that furnished such compound for screening (*i.e.*, the Party associated with the relevant compound set forth on Schedule 1.124 or Lilly with respect to any compound falling under Section 10.2.1(a)(ii)). Any disputes as to whether a Potential Collaboration Compound should be designated as a cGAS/STING Compound or Collaboration Compound shall be resolved as set forth in Section 15.2.

4.2.3 Each cGAS/STING Compound shall be subjected to the [***] in accordance with the Research Plan. **[***]**.

4.2.4 **[***]** (unless otherwise determined to be Collaboration Compounds pursuant to the last sentence of this Section 4.2.4), and as provided further in Section 2.5, all intellectual property rights in and to any such Excluded Compounds shall remain with the Party that furnished such compound for screening (*i.e.*, the Party associated with the relevant compound set forth on Schedule 1.124 or Lilly with respect to any compound falling under Section 10.2.1(a)(ii)). Any disputes as to whether a cGAS/STING Compound should be designated as a Collaboration Compound shall be resolved as set forth in Section 15.2.

4.2.5 Notwithstanding anything to the contrary herein, including Sections 1.24, 1.160, 4.2.1, 4.2.2, and 4.2.3, following the expiration of the Research Term (and the related Research Plan), **[***]** for determining (a) **[***]**, with respect to, (i) **[***]** or (ii) **[***]**, in each case of (i) and (ii) as appropriate to determine whether a given Potential Collaboration Compound is a cGAS/STING Compound or an Excluded Compound; and (b) whether any cGAS/STING Compound [***] and is a Collaboration Compound or an Excluded Compound. **[***]** if any such identified Excluded Compound was **[***]**.

4.2.6 **[***]**, and as a result the Potential Collaboration Compound never becomes a "Collaboration Compound" hereunder, **[***]**, such product shall be deemed a Product for all purposes hereunder.

4.3 **Candidate Selection.**

4.3.1 Lead Selection. The Lead Selection Criteria as of the Effective Date are attached hereto as Schedule 1.93. The JRC shall review the Lead Selection Criteria periodically during the Research Term in light of results obtained under the Research Plan and other relevant information. During the Research Term and for a period of **[***]** (**[***]**) days thereafter, a Party shall provide written notice to the JRC of any Collaboration Compound in the event that such Party reasonably believes such Collaboration Compound approximates the Lead Selection Criteria.

Within **[***]** (**[***]**) days after receipt of such notice, the JRC shall convene a special meeting to review the data and information associated with such Collaboration Compound and shall decide whether such Collaboration Compound should be selected as a Lead Candidate. The time between the JRC's receipt of such notice and the selection of a Lead Candidate is referred to herein as the "**Deliberation Period**." Any disputes as to whether a Collaboration Compound should be designated as a Lead Candidate shall be resolved as set forth in Section 3.7. From and after the expiration of the Research Term, **[***]**; provided that **[***]**.

4.3.2 Candidate Selection. The Candidate Selection Criteria as of the Effective Date are attached hereto as Schedule 1.22. The JRC shall review the Candidate Selection Criteria periodically during the Research Term in light of results obtained under the Research Plan and other relevant information. During the Research Term and for **[***]** (**[***]**) days thereafter, a Party shall provide written notice to the JRC of any Lead Candidate in the event that such Party reasonably believes such Lead Candidate approximates the Candidate Selection Criteria. Within **[***]** (**[***]**) days after receipt of such notice, the JRC shall convene a special meeting to review the data and information associated with such Lead Candidate and, within **[***]** (**[***]**) days of such notice, shall decide whether such Lead Candidate should be selected as a Selected Candidate. Any disputes as to whether a Lead Candidate should be designated as a Selected Candidate shall be resolved as set forth in Section 3.7. From and after the expiration of the Research Term, **[***]**; provided that **[***]**, and **[***]** associated therewith.

4.4 **Compliance**.

4.4.1 Applicable Laws. Each Party shall perform its obligations and exercise its rights hereunder in compliance with all Applicable Laws. For clarity, with respect to each activity performed under the Research Plan that will or would reasonably be expected to generate Research Data to be submitted to a Regulatory Authority in support of an IND, each Party shall comply with the regulations and guidance of the FDA that constitute GRP, GLP or GMP (or, if and as appropriate under the circumstances, International Conference on Harmonization ("**ICH**") guidance or other comparable regulation and guidance of any Regulatory Authority in any country or region in the Territory).

4.4.2 Compliance with Anti-Corruption Laws. Without limiting Section 4.4.1, in connection with this Agreement, each Party shall comply with all applicable local, national, and international laws, regulations, and industry codes dealing with government procurement, conflicts of interest, corruption or bribery, and shall not (i) make or promise to make, directly or indirectly, any improper payment or unlawful transfer of anything of value to any government official; government entity (including any government-owned or -controlled company); public international organization; political party or organization or official or candidate thereof; or any other person or entity; (ii) violate the United States Foreign Corrupt Practices Act of 1977, as amended (15 U.S.C. § 78dd-1, *et seq.*), the United Kingdom Bribery Act 2010 http://www.legislation.gov.uk/ukpga/2010/23/pdfs/ukpgaen_20100023_en.pdf), or any applicable Law of similar effect; or (iii) offer, promise, accept, or receive any unlawful payments, contributions, expenditures or gifts, or anything else of value, including bribes, gratuities, kickbacks, lobbying expenditures, political contributions, and contingent fee payments.

4.4.3 Prohibited Conduct. In connection with this Agreement, neither Party has made, offered, given, promised to give, or authorized, and will not make, offer, give, promise to give, or authorize, any bribe, kickback, payment or transfer of anything of value, directly or indirectly, to any person or to any Government Official for the purpose of: (a) improperly influencing any act or decision of the person or Government Official; (b) inducing the person or Government Official to do or omit to do an act in violation of a lawful or otherwise required duty; (c) securing any improper advantage; or (d) inducing the person or Government Official to improperly influence the act or decision of any organization, including any government or government instrumentality, to assist Aduro or Lilly in obtaining or retaining business.

4.4.4 Certain Standards Applicable to Research Activities. Without limiting Section 4.4.1, all research done by either Party for non-regulated work under this Agreement will be conducted in accordance with the Research Plan, GRP, Eli Lilly and Company Animal Care and Use Requirement for Animal Researchers and Suppliers as set forth in Schedule 1.54 and all applicable data privacy and security laws and regulations. If Lilly requests, Aduro will complete a self-assessment examination form based on such quality standards; provided that [***]. For purposes of this Agreement, if either Party requests, the other Party will complete a self-assessment examination form based on such quality standards.

4.4.5 Compliance Audits.

(a) Without limiting Section 8.3.5 (which is specific to financial audits) and other Sections cross-referencing Section 8.3.5, during the Research Term, Lilly and its duly authorized representatives, shall have the right, **[***]**, on reasonable prior written notice and during normal business hours, to audit Aduro's facilities, where Aduro is performing activities under the Research Plan, including reviewing such documents and records as is reasonably necessary for assessing Aduro's compliance with this Agreement; provided that Lilly may conduct such an audit of Aduro following the end of the Research Term to the extent that such an audit is required by Applicable Law or is necessary or useful in responding to a request from a Regulatory Authority; provided further, **[***]**. It is understood that Lilly undertakes any obligation to inspect, audit or qualify the facilities and any inspection conducted hereunder is for Lilly's sole interest without undertaking any obligation or liability to Aduro or any other person or entity. Any audit under this Section 4.4.5 conducted by or on behalf of Lilly shall not relieve Aduro from any of its obligations or liabilities under this Agreement.

(b) During the Research Term, to the extent that Aduro receives an inquiry from a Regulatory Authority related to the Aduro Research Activities that it believes in good faith Lilly is in possession of information that is necessary or useful in responding to such inquiry, Aduro shall have the right to ask questions of Lilly with respect thereto, to which Lilly shall use Commercially Reasonable Efforts to promptly respond to Aduro. For clarity, **[***]**.

4.4.6 Compliance with Internal Compliance Codes and Party Specific Regulations. All Internal Compliance Codes and Party Specific Regulations are binding only in accordance with their terms and only upon the Party to which they relate. The Parties agree to cooperate with each other to insure that each Party is able to comply with the substance of its respective Internal Compliance Codes and, to the extent practicable, to operate in a manner consist with its usual Compliance related processes. Neither Party shall be obligated to pursue any course of conduct that would result in such Party being in material breach of any Internal Compliance Codes or Party Specific Regulations applicable to it.

4.4.7 Subcontractors and Agents. Each Party agrees that it will not retain any subcontractor, representative, or agent in connection with the performance of this Agreement without requiring such subcontractor, representative, or agent to enter into a written agreement with such Party requiring compliance with Applicable Laws, including anti-corruption laws, and the obligations set forth in this Section 4.4 (to the extent applicable) prior to any involvement in connection with this Agreement.

4.5 **Record Keeping**. Each Party shall maintain complete and accurate records (paper or electronic as applicable) of its Research and Development activities in sufficient detail, including in sufficient detail for purposes of making patent filings, in good scientific manner, or otherwise in a manner that reflects all work done and results achieved, as well as, with respect to Aduro, [***]**.**

5. DEVELOPMENT ACTIVITIES; REGULATORY ACTIVITIES; SUPPLY

5.1 **Responsibility for Development**. As between the Parties, Lilly shall have the sole right and responsibility, at its sole cost and expense, for the conduct of all Development activities in respect of any Product in the Territory.

5.2 **Engagement of Third Party Contractors**. Lilly shall have the right to engage Third Party contractors, suppliers, or vendors to perform any of its Development activities, subject to Section 2.1.3 (to the extent applicable) and Section 4.4.7.

5.3 **Development Diligence**.

5.3.1 Lilly shall use Commercially Reasonable Efforts during the Term to Develop, either itself or through one or more Lilly Affiliates or Sublicensees, [***] and shall commit such resources (including employees, agents, consultants, facilities, equipment and materials) as are necessary to comply with such diligence obligation.

5.3.2 Lilly shall provide to Aduro a written report on or about **[***]** of each Calendar Year, including a high-level summary of material (a) Clinical Trials completed, (b) work-in-progress, (c) current schedules or anticipated events or milestones and (d) Development-related transaction(s) involving Products, which summaries shall include relevant activities conducted and being conducted by Lilly Affiliates or Sublicensees. **[***]**.

5.4 **Co-Funding Option**.

5.4.1 Discussion by the Parties Prior to Exercise. On a Product-by-Product basis, no later than **[***]** (**[***]**) months prior to **[***]**, Lilly shall provide notice to Aduro of such **[***]** and an estimated budget (by Calendar Quarter and Calendar Year, to the extent available) of Lilly's anticipated future Research and Development Costs to be incurred up to **[***]** for such Product **[***]**, with sufficient detail to enable Aduro to assess whether to exercise its Co-Funding Option with respect to such Product pursuant to this Section 5.4 (the "**Base Development Budget**"). In addition, upon written request, Lilly will promptly provide to Aduro updates (if any) to the Base Development Budget made between the date Lilly provides the initial budget to Aduro pursuant to the foregoing sentence and the end of the Exercise Period (as defined below).

5.4.2 Exercise. On a Product-by-Product basis, Aduro will have the option (the "**Co-Funding Option**"), exercisable during the **[***]** (**[***]**)-day period immediately following **[***]** (as notified by Lilly) (the "**Exercise Period**") to elect to fund **[***]** percent (**[***]**%) of the Development Costs incurred by Lilly post-exercise of the Co-Funding Option for such Product. Aduro may exercise the Co-Funding Option by providing written notice of its decision to exercise the Co-Funding Option to Lilly prior to expiration of the Exercise Period.

5.4.3 Effects of Co-Funding Option Exercise. If Aduro exercises a Co-Funding Option during the applicable Exercise Period, then the Parties shall promptly enter into a standalone agreement memorializing: (a) an obligation that Lilly provide Aduro rolling estimates of all shared Development Costs for the Development process on a routine basis and not less than **[***]**, (b) an invoicing and payment process through which Aduro will pay in arrears **[***]** percent (**[***]**%) of the relevant Development Costs incurred by Lilly from and after the date of Aduro's exercise of the relevant Co-Funding Option, (c) an amendment to the Agreement, setting forth (i) payments equal to **[***]** percent (**[***]**%) of Net Sales (provided that such **[***]** percent (**[***]**%) payments shall in no event be subject to any of the reductions set forth in Section 8.3.2), (ii) a reduction in the milestone payments set forth in Sections **[***]** and (iii) establishing a joint development committee with reasonable and customary governance provisions, which will in any event ensure Lilly decision-making control over activities and budgets, and (d) reasonable and appropriate consequences in the event **[***]**.

6. REGULATORY MATTERS.

6.1 **Regulatory Filings**. As between the Parties, Lilly shall have the sole right and responsibility for, at its sole expense, (a) preparing (subject to Section 4.1.2), filing and maintaining all Regulatory Filings for Products in its own name in the Territory and (b) reporting to Regulatory Authorities all Adverse Events and Serious Adverse Events occurring in any Clinical Trial conducted by or on behalf of Lilly related to Products, to the extent required by Applicable Laws.

6.2 **Product-Related Regulatory Interactions**. From and after the end of the Research Term, as between the Parties, Lilly shall be solely responsible for any communications with any Regulatory Authorities regarding the Products. In the event that Aduro receives any communication from a Regulatory Authority following the end of the Research Term, Aduro shall refer such Regulatory Authority to Lilly **[***]**.

6.3 **Supply of Selected Candidate and Product**. Lilly shall be, as between the Parties, responsible for the global supply chain for Collaboration Compounds and Products, and shall be solely responsible for obtaining sufficient quantities of Collaboration Compounds, Lead Candidates and Selected Candidates, for pre-clinical, clinical and Commercialization purposes. Lilly will provide to Aduro, free of charge, the pre-clinical supply of Collaboration Compounds, Lead Candidates and Selected Candidates as reasonably required for the conduct of Aduro Research Activities under the Research Plan.

7. COMMERCIALIZATION OF PRODUCTS

7.1 **Responsibility for Commercialization of Products**. As between the Parties, Lilly shall be solely responsible, at its sole cost and expense, for the conduct of all aspects of the Commercialization of Products in the Territory, including (a) the conduct of: (i) all activities related to Clinical Trials and (ii) all pre-marketing, marketing, promotion, sales, distribution, import and export activities (including securing reimbursement, sales and marketing and conducting any post-marketing trials or databases and post-marketing safety surveillance); (b) the timing for the launch of Products and for submitting applications for reimbursement with respect to Products in any country in the Territory; and **[***]**.

7.2 **Commercialization Diligence**. Subject to obtaining Regulatory Approval for a Product, Lilly shall use Commercially Reasonable Efforts to Commercialize, either itself or through one or more Affiliates or Sublicensees, **[***]** dollars ($**[***]**).

8. CONSIDERATION

8.1 **Upfront Fee**. In partial consideration of the rights granted by Aduro to Lilly hereunder, Lilly shall pay to Aduro a one-time, non-refundable, non-creditable, upfront fee of twelve million dollars ($12,000,000) within fifteen (15) Business Days after the Effective Date.

8.2 **Milestone Payments**.

8.2.1 Development Milestones. Lilly shall make the following one-time non-refundable, non-creditable payments to Aduro, on a per-Product basis, within **[***]** days after the first achievement of each of the following milestone events by each Product to achieve each such milestone:

Milestone Event	**Milestone Payment ($ US Dollars)**
[***]	$ **[***]**

[***].

Notwithstanding the foregoing to the contrary, **[***]**. For clarity, a "Product" includes all doses and formulations of such Product, and milestones hereunder would not be repeated in the event of a formulation change or dosage change for a given Product. [***].

8.2.2 Sales Milestones. Lilly shall make the following one-time, non-refundable, non-creditable milestone payments to Aduro within **[***]** (**[***]**) days after the end of the Calendar Quarter during which Lilly has achieved each of the following milestone events with respect to each Product:

Milestone Event	**Milestone Payment ($ US Dollars)**
[***]	$ **[***]**

In the event **[***]** following the Calendar Quarter in which such sales milestone event occurred.

8.2.3 Notice and Payment of Milestones. Lilly shall provide Aduro with prompt written notice of the occurrence of each milestone event set forth in Sections 8.2.1 and 8.2.2, but in any event no later than **[***]** (**[***]**) days after the end of the Calendar Quarter during which the milestone was achieved. If Aduro believes any such milestone event has occurred and it has not received a written notice of same from Lilly within the notice period set forth in the prior sentence, it shall so notify Lilly in writing and shall provide to Lilly documentation or other information that supports its belief and Lilly shall promptly, but in any event within **[***]** (**[***]**) days, pay the corresponding milestone or respond to the same in good faith in writing with documentation or other information that reasonably supports its belief.

8.3 **Payment of Royalties; Royalty Rates; Accounting and Records**.

8.3.1 Payment of Royalties. Lilly shall pay Aduro royalties, on a Product-by-Product and country-by-country basis, on Net Sales of each Product in each Calendar Year (or partial Calendar Year), commencing with the First Commercial Sale of such Product in any country in the Territory and ending upon the last day of the last Royalty Term for such Product and country, at the following incremental rates:

Calendar Year Net Sales of such Product Increment	**Royalty Rate (%)**
[***]	**[***]**

Following expiration of the applicable Royalty Term for any Product, as applicable, in a given country, no further royalties will be payable in respect of sales of such Product in such country, the sales of such Product shall no longer be counted for purposes of establishing royalty tiers or the occurrence of a sales milestone under Section 8.2.2, and thereafter the licenses granted to Lilly hereunder with respect to such Product in such country will automatically become fully paid-up, perpetual, irrevocable and royalty-free.

8.3.2 Adjustments to Royalty Payments.

(a) *No Patent Coverage*. Notwithstanding anything to the contrary in Section 8.3.1, if any Product is sold in a country and [***] is not Covered by a Valid Claim] of any Product Patent Rights, the royalty rates applicable to Net Sales in such country shall be reduced by **[***]** percent (**[***]**%) of the rates set forth in Section 8.3.1, continuing until the last day of the applicable Royalty Term with respect to such Product and such country at issue.

(b) *Third Party IP Payments*. During the Term, Lilly shall have the right to negotiate and obtain a license from one or more Third Parties to Patent Rights that **[***]** (each such Third Party license is referred to herein as a "**Third Party License**"). If Lilly enters into any Third Party License in connection with the Development, Manufacture, or Commercialization of a Product **[***]** then, except as otherwise provided in this Agreement, Lilly shall be entitled to credit a percentage of any payments actually made by Lilly to any Third Party solely in respect of such Third Party License (collectively, the "**Third Party Payments**"), up to a maximum of **[***]** percent (**[***]**%) of such Third Party Payments, against royalties payable to Aduro under Section 8.3.1 in respect of that Product (as then currently adjusted to reflect other applicable reductions hereunder, including as permitted under this Section 8.3.2); provided that [***] but in no event [***].

(c) *Competing Generics*. In the event that one or more Third Parties sells a Competing Generic in any country in which a Product is then being sold by Lilly, then, from and after the First Commercial Sale of such Competing Generic, (i) if the cumulative unit volume of such Product sold in such country during a Calendar Quarter is **[***]**, then the applicable royalties in effect with respect to such Product in such country as specified in Section 8.3.1 shall be reduced by **[***]** percent (**[***]**%); (ii) if the cumulative unit volume of such Product sold in such country during a Calendar Quarter is **[***]**, then the applicable royalties in effect with respect to such Product in such country as specified in Section 8.3.1 shall be reduced by **[***]** percent (**[***]**%); and (iii) if the cumulative unit volume of such Product sold in such country during a Calendar Quarter is **[***]**, then the applicable royalties in effect with respect to such Product in such country as specified in Section 8.3.1 shall be reduced by **[***]** percent (**[***]**%). For clarity, **[***]**.

(d) *Limitations on Adjustments*. Notwithstanding Sections 8.3.2(a) and (b), in no event shall the cumulative deductions applicable to any royalty payment hereunder reduce such payment by more than **[***]** percent (**[***]**%); provided that Lilly shall have the right to carry forward for application against royalties payable to Aduro in future periods any amount (up to **[***]** percent (**[***]**%) of the amounts paid) that is not credited due to the limitation in the immediately preceding clause. Further, in the event Aduro has exercised the Co-Funding Option, the reductions permitted under this Section 8.3.2 shall not apply to the **[***]** percent (**[***]**%) increase in royalties per tier. For the avoidance of doubt, **[***]**.

8.3.3 Payment Dates and Reports. Royalty payments shall be made by Lilly with respect to each Product within **[***]** (**[***]**) days after the end of each Calendar Quarter in which a sale of such Product shall occur, commencing with the Calendar Quarter in which the First Commercial Sale of such Product occurs. Lilly shall also provide, at the same time each such payment is made, a report showing: **[***]**.

8.3.4 Late Payments. Lilly shall pay interest to Aduro on the aggregate amount of any payment that is not paid on or before the date such payment is due under this Agreement at a per annum rate of the **[***]**, or the maximum rate allowable by Applicable Laws, whichever is less.

8.3.5 Records; Audit Rights.

(a) Lilly shall, and shall cause its Affiliates and its and their Sublicensees to, keep materially complete and accurate financial books and records pertaining to the commercialization of Products hereunder, including books and records of Net Sales of Products, in sufficient detail to calculate and verify all amounts payable hereunder. Lilly shall, and shall cause its Affiliates and its and their Sublicensees to, retain such books and records until the latest of (a) **[***]** (**[***]**) years after the end of the period to which such books and records pertain, (b) the expiration of the applicable tax statute of limitations (or any extensions thereof) and (c) for such period as may be required by Applicable Law.

(b) During the Term, Aduro shall not more than **[***]**, have the right to have Lilly's independent certified public accountants, or an independent auditor designated by Aduro from among one of the internationally recognized accounting firms known as KPMG, Deloitte, PricewaterhouseCoopers or Ernst & Young (*i.e.*, the "Big 4" global accounting firms) (the "**Auditor**"), inspect Lilly's records for **[***]** prior to the Calendar Year in which the audit request is made, for the purpose of determining the accuracy of royalty payments. No period will be audited more than once. Aduro shall submit an audit plan, including audit scope, to Lilly **[***]**, prior to audit implementation. The Auditor shall keep confidential any information obtained during such inspection and shall report to Aduro and Lilly only the amounts of net sales and royalties due and payable. If determined that additional royalties are owed, or that royalties were overpaid, during such period, Lilly will pay Aduro the additional royalties, or Aduro will pay Lilly the overpaid royalties, within **[***]** (**[***]**) days of the date the Auditor's written report is received by the paying party. The fees charged by the Auditor will be paid by Aduro, unless any additional royalties owed exceed **[***]** percent (**[***]**%) and **[***]** U.S. dollars ($**[***]**) of the royalties paid for the royalty period subject to audit, in which case Lilly will pay the fees of the Auditor.

8.3.6 Payments; Withholding Tax.

(a) *Payments in Dollars*. All payments made by Lilly under this Article 8 shall be made by wire transfer from a banking institution in U.S. dollars in accordance with instructions given in writing from time to time by Aduro; provided, however, that Lilly will disburse payments only to Aduro's jurisdiction of incorporation or to a jurisdiction in which Aduro has a significant business presence.

(b) *Withholding Taxes*. If Applicable Laws require withholding of income or other taxes imposed upon any payments made by Lilly to Aduro under this Agreement, including any VAT or sales tax, Lilly shall (i) make such withholding payments as may be required, (ii) subtract such withholding payments made by Lilly to Aduro from such payments made by Lilly to Aduro, (iii) submit appropriate proof of payment of the withholding taxes to Aduro within a reasonable period of time and (iv) promptly provide Aduro with all official receipts with respect thereto. Lilly shall render Aduro reasonable assistance in order to allow Aduro to obtain the benefit of any present or future treaty against double taxation which may apply to such payments.

9. TREATMENT OF CONFIDENTIAL INFORMATION; PUBLICITY

9.1 **Confidentiality**.

9.1.1 Confidentiality Obligations. Aduro and Lilly each recognizes that the other Party's Confidential Information and Proprietary Materials constitute highly valuable assets of such other Party. Aduro and Lilly each agrees that, during the Term and for an additional **[***]** after termination or expiration of this Agreement, (i) subject to Section 9.1.2, it will not disclose, and will cause its Affiliates and Sublicensees not to disclose, any Confidential Information or Proprietary Materials of the other Party, (ii) it will not use, and will cause its Affiliates and Sublicensees not to use, any Confidential Information or Proprietary Materials of the other Party, except as expressly permitted in this Agreement, (iii) it shall not attempt to reverse engineer, deconstruct or in any way determine the structure or composition of any of the other Party's Proprietary Materials, and (iv) it will use the same efforts to protect the other Party's Confidential Information as it does to protect its own similar Confidential Information (but, in any event, no less efforts than a reasonable Person in the industry would use to protect similar information). To the extent that any Confidential Information or Proprietary Materials are identified in writing as a "trade secret" by either Party, the other Party's obligations of confidentiality and non-use with respect to such trade secret information shall continue for so long as the relevant Confidential Information remains a "trade secret."

9.1.2 Limited Disclosure.

(a) Each Disclosing Party agrees that disclosure of its Confidential Information or any transfer of its Proprietary Materials may be made by the Receiving Party:

(i) to any employee, director or agent of, or consultant to, such Receiving Party or to other Third Parties to enable such Receiving Party to exercise its rights (including Lilly's right to fully exploit the license granted to it under Section 2.1) or to carry out its responsibilities under this Agreement;

(ii) to such Receiving Party's professional, legal and financial advisors;

(iii) as reasonably necessary in connection with an actual or potential (A) permitted license or sublicense of such Receiving Party's rights hereunder or (B) merger, acquisition, consolidation, share exchange or other similar transaction involving such Receiving Party and any Third Party;

(iv) to any Third Party that is or may be engaged by a Receiving Party to perform services in connection with the Research Plan (or perform services in connection with carrying out Development or Commercialization activities) as necessary to enable such Third Party to perform such services;

(v) with respect to Lilly as the Receiving Party, to the extent necessary or useful for Lilly to exploit the license granted to it under Section 2.1; and

[***] Certain information in this document has been omitted and filed separately with the Securities and Exchange Commission. Confidential treatment has been requested with respect to the omitted portions.

(vi) for any other purpose with the Disclosing Party's written consent, which consent shall not be unreasonably withheld, conditioned or delayed;

provided that any disclosure made pursuant to this Section 9.1.2 shall only be made to Persons who have a need to know such Confidential Information and who are bound by written obligations of confidentiality and non-use at least as strict as those described in this Article 9; provided, further, that each Party shall each remain responsible for any failure by such Persons to treat such Confidential Information as required under this Section 9.1.2.

(b) Each Disclosing Party also agrees that disclosure of its Confidential Information may be made by the Receiving Party:

(i) as reasonably necessary to file, prosecute or maintain Patent Rights, or to file, prosecute or defend litigation related to Patent Rights, or to file or maintain a Regulatory Filing, in accordance with this Agreement;

(ii) as required by court order, provided that the Receiving Party provides the other Party prior written notice of the required disclosure and takes reasonable steps to limit such disclosure to the minimum required amount and to obtain, or cooperate with the other Party in obtaining, a protective order or other similar order requiring that such Confidential Information be used only for the purposes required by such court order, law, or regulation; and

(iii) as reasonably necessary to comply with Applicable Laws, including in response to rules or guidance of the United States Internal Revenue Service or other taxing authority, or disclosures required by the U.S. Securities and Exchange Commission or made pursuant to the requirements of the national securities exchange or other stock market on which Receiving Party's securities are traded; and

(iv) as appropriate in connection with the financing of such Receiving Party in a public or private offering, as advised by Receiving Party's counsel.

9.1.3 Requirement to Cooperate to Enable Accurate Public Disclosure. To the extent either Party discloses to the other Party any Confidential Information which is a fact, result or event relating to the Research Activities or the Development, Manufacture or Commercialization of any Product that the Receiving Party in good faith reasonably believes is insufficient to allow the Receiving Party to fully understand the materiality of such Confidential Information for purposes of determining whether the Receiving Party is required to disclose, to any Government Authority or publicly, any such Confidential Information in order to comply with Applicable Laws (including securities laws or regulations and the applicable rules of any public stock exchange), the Disclosing Party agrees to discuss such Confidential Information with the Receiving Party and provide any additional information reasonably necessary to enable the receiving Party to assess the materiality, and the accuracy and completeness, of such information for such public disclosure purposes as the case may be, which additional information shall be treated as the Disclosing Party's additional Confidential Information and shall be treated in accordance with the terms hereof.

9.1.4 Employees and Consultants. Aduro and Lilly each hereby represents and warrants that all of its employees, directors, subcontractors, representatives, agents and consultants, and all of the employees and consultants of its Affiliates, Sublicensees and relevant Third Parties, who have access to Confidential Information or Proprietary Materials of the other Party are or will, prior to having such access, be bound by written obligations of confidentiality and non-use at least as strict those as described in Article 9. Each Party agrees to use, and to cause its Affiliates, Sublicensees and relevant Third Parties to use, commercially reasonable efforts to enforce such obligations and to prohibit its employees, directors, agents and consultants from using such Confidential Information except as expressly permitted hereunder.

9.2 **Publicity**.

9.2.1 Press Releases. The Parties shall, upon such timing as the Parties jointly agree, issue a joint press release with respect to this Agreement, and each Party may make subsequent public disclosure of the contents of such press release without further approval of the other Party. The Parties also may issue mutually agreed upon press releases upon the occurrence of any milestone event achieved with respect to the Research, Development, Manufacture or Commercialization of any Collaboration Compound and/or Product hereunder, announcing the occurrence of the milestone event, and to provide an annual update to each Party's shareholders regarding progress of the collaboration. Subject to the foregoing, except as otherwise permitted under this Article 9, neither Party shall issue a press or news release or make any similar public announcement related to the Research Plan or the terms and conditions of this Agreement without the prior written consent of the other Party, not to be unreasonably withheld. If a Party determines that an announcement related to this Agreement (as distinct from a publication related to a Product, which is subject to Section 9.2.2) is required by Applicable Laws, it shall, to the extent reasonably practicable and permitted, give the other Party at least **[***]** (**[***]**) Business Days advance notice of the text of the announcement so that the other Party will have an opportunity to comment upon the announcement. With respect to any such public disclosure, except for the initial press release described above, the receiving Party (the "**Requesting Party**") shall provide the other Party (the "**Reviewing Party**") with a draft of the Content (as defined in the next sentence) of the draft press release or proposed disclosure for review, at least **[***]** (**[***]**) Business Days **[***]** in advance of the issuance of the press release or filing. The word "**Content**" in this Section 9.2.1 means any information relating to the activities contemplated by this Agreement, and does not include any other business information of the Requesting Party or information pertaining to the "safe harbor" provisions of the Private Securities Litigation Reform Act of 1995 relating to "forward-looking statements." The Reviewing Party may notify the Requesting Party of any reasonable objections or suggestions that the Reviewing Party may have regarding the Content in the proposed public disclosure provided for review, and the Requesting Party shall reasonably consider any such objections or suggestions that are provided in a timely manner. The Requesting Party shall use diligent and good faith efforts to adopt the reasonable requests of the Reviewing Party with respect to its Confidential Information.

9.2.2 Right to Publish/Present Publications. Notwithstanding the foregoing or anything to the contrary in this Agreement, **[***]**; provided that Lilly shall submit a draft of any such publication to the extent such publication contains Aduro Know-How, or Aduro's Confidential Information (a "**Publication**") to Aduro prior to any such submission for publication

or oral presentation and Aduro shall have the right to notify Lilly in writing within **[***]** (**[***]**) Business Days of receipt of such draft if it reasonably determines that such draft contains Aduro Know-How that is Confidential Information of Aduro, in which case Lilly shall remove such Confidential Information from the proposed Publication. Subject to the foregoing portion of this Section 9.2.2, Aduro shall have the right to publish or present Aduro Know-How without the prior written consent of Lilly so long as no Confidential Information of Lilly is included in any such publication or presentation (including no [***]).

9.3 **Permitted Publication**. Notwithstanding Section 9.2, either Party may include in a public disclosure, without prior delivery to or approval by the other Party, any information which has previously been included in a public disclosure pursuant to Section 9.2. A Party relying on this Section 9.3 shall bear the burden of establishing that information has previously been included in a public disclosure that has been approved pursuant to Section 9.2 or published or publicly disclosed by the other Party.

9.4 **Use of Proprietary Materials**. From time to time during the Term, either Party (the "**Transferring Party**") may supply the other Party (the "**Recipient Party**") with Proprietary Materials of the Transferring Party for use in the Research Plan. Any Proprietary Materials being provided to Recipient Party shall be accompanied by a Materials Transfer Record substantially in the form of Schedule 9.4, which shall be signed by an official representative of both Parties. In connection with the receipt of any Proprietary Materials from the Transferring Party, each Recipient Party hereby agrees that (a) it shall not use such Proprietary Materials for any purpose other than exercising its rights or performing its obligations hereunder; (b) it shall use such Proprietary Materials only in compliance with all Applicable Laws; (c) it shall not transfer any such Proprietary Materials to any Third Party without the prior written consent of the Transferring Party; (d) the Recipient Party shall not acquire any rights of ownership, or title in or to, such Proprietary Materials as a result of such supply by the Transferring Party; and (e) upon the expiration or termination of this Agreement, the Recipient Party shall, if and as instructed by the Transferring Party, either destroy or return any such Proprietary Materials that are not the subject of the grant of a continuing license hereunder; provided that each Recipient Party may retain the Proprietary Materials of the Transferring Party for the sole purpose of fulfilling regulatory requirements or industry best practices. EACH PARTY ACKNOWLEDGES THAT THE PROPRIETARY MATERIALS ARE BEING SUPPLIED WITH NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR THAT THE USE OF THE PROPRIETARY MATERIALS WILL NOT INFRINGE ANY PATENT OR PROPRIETARY RIGHTS OF ANY THIRD PARTY.

9.5 **Residual [***]**. Except to the extent Aduro has granted exclusive rights to Lilly under Section 2.1 (including as and to the extent such rights survive this Agreement), each Party grants the other Party a non-exclusive license to use, outside the scope of this Agreement and for any purpose, any [***] who have had access to [***] pursuant to, [***] any such residual knowledge and no longer have access to any tangible embodiments of any [***]; provided, further, that any use of such residual knowledge is on an "as is, where is" basis, with all faults and all representations and warranties disclaimed and at such Party's sole risk. Notwithstanding anything to the contrary in this Agreement, nothing in this Section 9.5 shall, or shall be interpreted to, grant

any license or other right to use any patent, trademark or copyright. Notwithstanding the foregoing, such [***]. The ability to use any such [***]. Furthermore, notwithstanding anything to the contrary in this Agreement, except to the extent Aduro has granted exclusive rights to Lilly under Section 2.1 (including as and to the extent such rights survive this Agreement), neither Party is forfeiting any rights that each may have to perform research activities in compliance with 35 U.S.C. § 271(e)(1) or any experimental or research use exemption that may apply in any country.

10. INTELLECTUAL PROPERTY RIGHTS

10.1 **Ownership of Background IP**.

10.1.1 As between the Parties, Aduro shall retain all of its right, title and interest in and to the Aduro Patent Rights and the Aduro Know-How.

10.1.2 As between the Parties, Lilly shall retain all of its right, title and interest in and to the Lilly Patent Rights and the Lilly Know-How.

10.2 **Ownership of Collaboration IP**.

10.2.1 Lilly Collaboration IP.

(a) As between the Parties, Lilly shall own all right, title and interest in and to all "**Lilly Collaboration IP**," *i.e.*, Know-How and Patent Rights conceived or created or first reduced to practice after the Effective Date:

(i) **[***]**

(b) To the extent Aduro or any of its Affiliates or (sub)licensees has any ownership interest (*e.g.*, by way of conception) in or to any Lilly Collaboration IP, Aduro shall, and does hereby, transfer and assign to Lilly, without additional consideration, undivided ownership of Aduro's interest in such Lilly Collaboration IP to the extent necessary to vest sole ownership in Lilly, which transfer and assignment Lilly hereby accepts. Each Party shall execute and deliver to the other Party a deed(s) of such assignment, in a mutually agreeable form and will take whatever actions reasonably necessary, including the appointment of the other Party as its attorney in fact solely to make such assignment, to effect such assignment.

10.2.2 Aduro-Owned IP.

(a) As between the Parties, Aduro shall own all right, title and interest in and to all "**Aduro Collaboration IP**," *i.e.*, all Know-How and Patent Rights conceived or created or first reduced to practice after the Effective Date, other than Lilly Collaboration IP:

(i) **[***]**

(b) To the extent Lilly or any of its Affiliates or Sublicensees has any ownership interest (*e.g.*, by way of conception) in or to any Aduro Collaboration IP, Lilly shall, and does hereby, transfer and assign to Aduro, without additional consideration, undivided ownership of Lilly's interest in such Aduro Collaboration IP to the extent necessary to vest sole

ownership in Aduro, which transfer and assignment Aduro hereby accepts. Each Party shall execute and deliver to the other Party a deed(s) of such assignment, in a mutually agreeable form and will take whatever actions reasonably necessary, including the appointment of the other Party as its attorney in fact solely to make such assignment, to effect such assignment.

10.2.3 Jointly-Owned Collaboration IP.

(a) The Parties shall jointly own all right, title and interest in and to all "**Jointly-Owned Collaboration IP**", *i.e.,* all Know-How and Patent Rights conceived or created or first reduced to practice after the Effective Date in the performance of the Research Activities other than Lilly Collaboration IP or Aduro Collaboration IP.

(b) To the extent any Jointly-Owned Collaboration IP is made solely by Lilly or Aduro, such Party shall, and does hereby, transfer and assign to Lilly or Aduro, as applicable, without additional consideration, one undivided half of such Party's interest in such Jointly-Owned Collaboration IP to the extent necessary to vest joint ownership in Lilly or Aduro, which transfer and assignment the other Party hereby accepts. Each Party shall execute and deliver to the other Party a deed(s) of such assignment, in a mutually agreeable form and will take whatever actions reasonably necessary, including the appointment of the other Party as its attorney in fact solely to make such assignment, to effect such assignment.

(c) Except as expressly provided otherwise in this Agreement, neither Party shall have any obligation to obtain any approval of the other Party for, nor pay the other Party any share of the proceeds from or otherwise account to the other Party for, the practice, enforcement, licensing, assignment or other exploitation of any Jointly-Owned Collaboration IP, and each Party hereby waives any right it may have under the laws of any country to require such approval, sharing or accounting; provided, however, that neither Party shall exercise its rights under the Jointly-Owned Collaboration IP to Research, Develop, Manufacture or have Manufactured, use, Commercialize or otherwise exploit compounds (including Collaboration Compounds and Competing Products) outside the Field, or in the Field other than pursuant to this Agreement.

11. FILING, PROSECUTION AND MAINTENANCE OF PATENT RIGHTS

11.1 **Patent Prosecution**.

11.1.1 Prosecution Rights. As between the Parties, Lilly, at its sole expense, shall be primarily responsible for the Patent Prosecution of all Lilly Patent Rights, Aduro Patent Rights, and Joint Patent Rights. Aduro shall cooperate with and assist Lilly in all reasonable respects in connection with Lilly's Patent Prosecution of such Patent Rights. If Lilly decides to cease prosecution or to allow to lapse any Lilly Patent Right, Aduro Patent Right, or Joint Patent Right, it shall inform Aduro of such decision or cessation promptly and, in any event, so as to provide Aduro a reasonable amount of time to meet any applicable deadline to establish or preserve such Patent Rights. Aduro shall have the right, but not the obligation, to assume sole responsibility for continuing the prosecution of such Patent Rights and paying any required Patent Costs to maintain such Patent Rights or defend such Patent Rights; provided that Aduro shall not have the right to continue prosecuting any such Patent Rights to the extent that Lilly's notice pursuant to the foregoing sentence states that Lilly is ceasing such prosecution to benefit the Product and provides a commercially reasonable justification for such strategy.

11.1.2 Patent Defense Rights. Each Party will notify the other Party within **[***]** (**[***]**) Business Days of becoming aware of any interference, declaratory judgment, opposition, *inter partes* review, re-examination or similar action or proceeding alleging the invalidity, unenforceability or non-infringement of any of the Aduro Patent Rights, Joint Patent Rights, or Lilly Patent Rights in the Territory. Lilly shall be responsible for the Patent Defense of Lilly Patent Rights, Aduro Patent Rights, and Joint Patent Rights. Aduro shall cooperate with and assist Lilly in all reasonable respects, in connection with Lilly's Patent Defense activities. All Patent Costs incurred by Lilly in connection with the Patent Defense of such Patent Rights shall be, as between the Parties, the sole responsibility of Lilly. If Lilly decides to cease such Patent Defense with respect to any Aduro Patent Right, Lilly Patent Right or Joint Patent Right, it shall inform Aduro of such decision promptly and, in any event, so as to provide Aduro a reasonable amount of time to meet any applicable deadline to defend or preserve such Patent Rights. Upon receipt of such notice, Aduro shall have the right, but not the obligation, to assume sole responsibility for Patent Defense of such Patent Rights and paying all future Patent Costs associated with such Patent Defense; provided that Aduro shall not have the right to continue any such Patent Defense to the extent that Lilly's notice pursuant to the foregoing sentence states that Lilly is ceasing such Patent Defense to benefit the Product and provides a commercially reasonable justification for such strategy.

11.1.3 Information and Cooperation. Lilly shall (i) promptly provide Aduro with copies of all patent applications with respect to Aduro Patent Rights or Joint Patent Rights to be filed pursuant to Section 11.1.1 and other material submissions and correspondence with the applicable patent offices, in sufficient time to allow for review and comment by Aduro and (ii) provide Aduro and its patent counsel with an opportunity to consult with Lilly and its patent counsel regarding the filing and contents of any such application, amendment, submission or response that relates to such Patent Rights. The advice and suggestions of Aduro and its patent counsel shall be taken into consideration in good faith by Lilly and its patent counsel in connection with such filing; provided that if Aduro fails to provide any comment on or before the expiration of **[***]** before the proposed filing date notified by Lilly, Lilly's obligations under this Section 11.1.3 shall be deemed to have been fulfilled.

11.2 **Enforcement and Defense**.

11.2.1 Third Party Infringement.

(a) *In General; Right to Enforce*.

(i) If either Party becomes aware of (A) any actual or suspected infringement of any Joint Patent Rights, Lilly Patent Rights, or Aduro Patent Rights or misappropriation of any Aduro Know-How, Lilly Know-How, or Joint Know-How, or (B) the submission by any Third Party of an application for approval of a generic product under the FDCA, or similar legislation outside the United States, for any Product, or otherwise claiming that any Joint Patent Rights, Lilly Patent Rights, or Aduro Patent Rights are invalid or unenforceable or claiming that any such Patents would not be infringed by the making, use, offer for sale, sale or import of a product for which an application under the FDCA is filed, or any equivalent or similar certification or notice in any other jurisdiction in the Territory (each, an "**Infringement**"), that Party shall promptly notify the other Party of such Infringement of which it is aware (each, an "**Infringement Notice**"). The Parties shall promptly meet to discuss the Infringement and the strategy for patent enforcement with respect to that Infringement; provided that, **[***]**.

(ii) Lilly shall have the first right, but not the obligation, to address any Infringement in the Territory with respect to the Lilly Patent Rights, the Aduro Patent Rights or Joint Patent Rights, or with respect to the Lilly Know-How, Aduro Know-How or Joint Know-How, at its sole expense, by taking reasonable steps, which may include the institution of legal proceedings or other action, and to compromise or settle such Infringement (each, an "**Infringement Response**"), provided that: (A) Lilly shall keep Aduro reasonably informed about any such Infringement Response and Aduro shall provide all reasonable cooperation to Lilly in connection with such Infringement Response; and (B) **[***]**. If Lilly does not intend to prosecute or defend an Infringement of such Patent Rights, or ceases to diligently pursue an Infringement Response with respect to such an Infringement of Aduro Patent Rights or Joint Patent Rights, it shall promptly inform Aduro in such a manner that such Infringement Response will not be prejudiced and Aduro shall have the right, but not the obligation, to address such Infringement, at Aduro's sole expense, in accordance with this Section 11.2.1(a)(i), which shall apply *mutatis mutandis*. For clarity, **[***]**.

(b) *Right to Representation; Cooperation.* Each Party shall have the right to participate and be represented by counsel that it selects, at its sole expense, in any Infringement Response instituted or continued under Section 11.2.1(a) by the other Party. In any Infringement Response instituted under this Section 11.2.1, the Parties shall cooperate with and assist each other in all reasonable respects. If a Party with the right to initiate an Infringement Response under Section 11.2.1(a) to address an Infringement lacks standing to do so and the other Party has standing to initiate such action, then the Party with the right to initiate an action under Section 11.2.1(a) may name the other Party as plaintiff in such action or may require the Party with standing to initiate such Infringement Response at the expense of the other Party

(c) *Allocation of Recoveries*. Any monetary settlements, damages or monetary awards ("**Recovery**") recovered by either Party pursuant to any Infringement Response shall, after reimbursing the Parties for their reasonable out-of-pocket expenses in making such Recovery **[***]**, with the remainder to be **[***]**.

11.3 **Defense of Claims**. If any action, suit or proceeding is brought against either Party or any Affiliate of either Party alleging the misappropriation or infringement of the Know-How or Patent Rights of a Third Party by reason of the Research, Development, Manufacture or Commercialization of any Product, such Party shall notify the other Party within **[***]** (**[***]**) days of the earlier of (a) receipt of service of process in such action, suit or proceeding or (b) the date such Party becomes aware that such action, suit or proceeding has been instituted, and the Parties shall meet as soon as possible to discuss the overall strategy for defense of such matter. Except as unanimously agreed by the Parties, Lilly shall have the right but not the obligation to defend any such action, suit or proceeding at its sole expense; (ii) Aduro shall have the right to separate counsel at its own expense in any such action, suit or proceeding; and (iii) the Parties shall cooperate with each other in all reasonable respects in any such action, suit or proceeding. Each Party shall promptly furnish the other Party with a copy of each communication relating to the alleged infringement that is received by such Party including all documents filed in any litigation. If Lilly does not intend to defend any such action, or ceases such defense, it shall inform Aduro of such decision promptly and, in any event, so as to provide Aduro a reasonable amount of time to meet any applicable deadline with respect to such defense. Upon receipt of such notice, Aduro

shall have the right, but not the obligation, to assume sole responsibility for such defense at its sole expense; provided that Aduro shall not have the right to assume sole responsibility for or continue any such defense to the extent that Lilly's notice pursuant to the foregoing sentence states that Lilly is not defending such action or is ceasing such defense to benefit the Product and Lilly provides a reasonable justification for such strategy.

11.4 **Patent Term Extension**. The Parties shall cooperate with each other in obtaining patent term extensions or supplemental protection certificates or their equivalents in any country in the Territory where applicable to any Patent Right Covering the Product. Such cooperation shall include diligently and timely conferring and coordinating with respect to such matters to ensure compliance with applicable filing deadlines, and agreeing on procedures to be followed by the Parties to ensure such compliance. **[***]**.

12. TERM AND TERMINATION

12.1 **Term**. This Agreement shall commence on the Effective Date and shall continue in full force and effect, unless otherwise terminated pursuant to Section 12.2, until the expiration of all payment obligations under this Agreement with respect to the last Product in all countries in the Territory (the "**Term**"). Upon the expiration of the Royalty Term with respect to a given Product and country, the licenses granted to Lilly under Section 2.1 shall be retained as fully paid-up, irrevocable and perpetual, exclusive licenses with respect to such Product and such country.

12.2 **Termination**. This Agreement may be terminated as follows:

12.2.1 Unilateral Right to Terminate Agreement. Lilly may terminate this Agreement in its entirety or on a Product-by-Product basis effective at any time, by providing not less than **[***]** prior written notice to Aduro**[***]**.

12.2.2 Termination for Breach.

(a) If a Party materially breaches this Agreement in its entirety, or, after commencement of Development of a Product, materially breaches this Agreement with respect to a given Product, then the non-breaching Party may provide the breaching Party with a written notice specifying the nature of the breach, and stating its intention to terminate this Agreement in its entirety, or with respect to a given Product, as applicable, if such breach is not cured.

(b) If (i) the material breach is with respect to an undisputed payment obligation and is not cured within a **[***]** period after the alleged breaching Party has received written notice of termination or (ii) if the material breach relates to any obligation other than a payment obligation and is not cured by the allegedly breaching Party within **[***]** after the receipt of such notice, the non-breaching Party may terminate the Agreement by written notice to the other Party.

(c) If the allegedly breaching Party in good faith disputes such material breach or the failure to cure or remedy such material breach such Party shall, within **[***]** of receipt of written notice from the other Party of termination (i) provide written notice of that dispute putting forward in reasonable detail the rationale for disputing the alleged breach to the

notifying Party and (ii) initiate dispute resolution procedures in accordance with Section 15.2, in which case, such termination shall not be effective until **[***]** after the dispute resolution award determining that the conditions for termination of this Section 12.2.2 are met; provided that the breach is not cured within such **[***]** period and during the pendency of any such dispute resolution the Parties shall continue performing their respective obligations, and exercising their respective rights, under this Agreement. The Parties hereby agree to take such steps as may be reasonably necessary to complete such dispute resolution process as expeditiously as possible given the circumstances.

(d) For clarity, this Agreement may only be terminated in its entirety pursuant to this Section 12.2.2 if the material breach affects the totality of this Agreement and is not isolatable to a single Product.

12.2.3 Termination for Insolvency. Either Party shall have the right to terminate this Agreement in its entirety upon immediate written notice if the other Party: (a) applies for or consents to the appointment of, or the taking of possession by, a receiver, custodian, trustee or liquidator of itself or of all of a substantial part of its property, (b) makes a general assignment for the benefit of its creditors, (c) commences a voluntary case under the Bankruptcy Code of any country, (d) files a petition seeking to take advantage of any Applicable Laws relating to bankruptcy, insolvency, reorganization, winding-up, or composition or readjustment of debts, (e) fails to controvert in a timely and appropriate manner, or acquiesce in writing to, any petition filed against it in any involuntary case under the Bankruptcy Code of any country, (f) takes any corporate action for the purpose of effecting any of the foregoing, (g) has a proceeding or case commenced against it in any court of competent jurisdiction, seeking (i) its liquidation, reorganization, dissolution or winding-up, or the composition or readjustment of its debts, (ii) the appointment of a trustee, receiver, custodian, liquidator or the like of all or any substantial part of its assets or (iii) similar relief under the Bankruptcy Code of any country, or an order, judgment or decree approving any of the foregoing is entered, or (h) has an order for relief against it entered in an involuntary case under the Bankruptcy Code of any country and, in any of (a) through (g) above, the application, assignment, commencement, filing, or corporate action continues unstayed for, or is not otherwise discharged or withdrawn on or before, a period of sixty (60) days.

12.3 **Consequences of Termination of Agreement**.

12.3.1 If this Agreement is terminated in its entirety by Lilly pursuant to Section 12.2.1 (Unilateral Right to Terminate for Convenience), or by Aduro pursuant to Section 12.2.2 (Termination for Breach) or Section 12.2.3 (Termination for Insolvency), then:

(a) all the licenses and rights granted by one Party to the other, except as set forth in this Section 12.3.1, will cease and revert to the granting Party, as of the date of such termination;

(b) Lilly shall use Commercially Reasonable Efforts to transfer back to Aduro all Aduro Know-How;

(c) Lilly shall grant, and hereby does grant, to Aduro and its Affiliates, an exclusive, worldwide license, with the right to grant sublicenses through multiple tiers, under

the Termination IP, solely to Research, Develop, Manufacture or have Manufactured, use, Commercialize and otherwise fully exploit Termination Products. Aduro shall pay to Lilly, in consideration for the foregoing license grant, [***] If Lilly is required to make any payments to a Third Party as a result of Aduro's or its Affiliates' exercise of the foregoing license, Aduro shall (x) **[***]** and (y) comply with any applicable terms and conditions contained in any relevant Third Party agreement. [***];

(d) Lilly shall use Commercially Reasonable Efforts to transfer to Aduro, and Aduro shall take delivery and transfer of, all Regulatory Filings and Regulatory Approvals, and Know-How within the Termination IP (and solely to the extent related exclusively) to Termination Products;

(e) Lilly shall use Commercially Reasonable Efforts to destroy (at Lilly's expense) or transfer to Aduro (at Aduro's expense), at the election of Aduro, all Termination Products in the possession or control of Lilly at the effective date of termination; and

(f) any sublicenses granted by Lilly hereunder to any Sublicensees shall become direct licenses under this Agreement, subject only to modifying the rights granted to (and payments due from) any such Sublicensees to be proportional to the rights granted by Lilly to any such Sublicensees.

12.3.2 If this Agreement is terminated on a Product-by-Product basis by Lilly pursuant to Section 12.2.1 (Unilateral Right to Terminate for Convenience), or by Aduro pursuant to Section 12.2.2 (Termination for Breach) or Section 12.2.3 (Termination for Insolvency), then:

(a) all the licenses and rights granted by one Party to the other, except as set forth in this Section 12.3.2, to the extent solely related to such Product will cease and revert to granting Party, as at the date of such termination;

(b) Lilly shall use Commercially Reasonable Efforts to transfer back to Aduro all Aduro Know-How solely related to such Termination Product;

(c) Lilly shall grant, and hereby does grant, to Aduro and its Affiliates, an exclusive, worldwide license, with the right to grant sublicenses through multiple tiers, under the Termination IP, solely to Research, Develop, Manufacture or have Manufactured, use, Commercialize and otherwise fully exploit the Termination Product. Aduro shall pay to Lilly, in consideration for the foregoing license grant, [***]. If Lilly is required to make any payments to a Third Party as a result of Aduro's or its Affiliates' exercise of the foregoing license, Aduro shall (x) **[***]** and (y) comply with any applicable terms and conditions contained in any relevant Third Party agreement. [***];

(d) Lilly shall use Commercially Reasonable Efforts to transfer to Aduro, and Aduro shall take delivery and transfer of, all Regulatory Filings and Regulatory Approvals, and Know-How within the Termination IP (and solely to the extent related exclusively) to Termination Products;

(e) Lilly shall use Commercially Reasonable Efforts to destroy (at Lilly's expense) or transfer to Aduro (at Aduro's expense), at the election of Aduro, all Termination Products in the possession or control of Lilly at the effective date of termination; and

(f) any sublicenses granted by Lilly hereunder to any Sublicensees with respect to the Termination Products shall become direct licenses under this Agreement, subject only to modifying the rights granted to (and payments due from) any such Sublicensees to be proportional to the rights granted by Lilly to any such Sublicensees.

12.3.3 If this Agreement is terminable by Lilly pursuant to Section 12.2.2 (Termination for Breach), then, at Lilly's discretion, in lieu of exercising such termination right, Lilly shall have the right, by way of written notice to Aduro, to continue this Agreement in accordance with its terms, subject only to a reduction by **[***]** percent (**[***]**%) of any amounts due to Aduro hereunder with respect to such Products as are eligible to be the subject of such termination.

12.3.4 Termination of this Agreement for any reason shall be without prejudice to Aduro's right to receive all milestone payments and royalties accrued under Sections 8.2.1, 8.2.2, and 8.3.1 prior to the effective date of such termination and any other payments due hereunder that have accrued prior to the effective date of such termination.

12.3.5 If, following termination of this Agreement, Lilly Commercializes a compound that is (i) subject to Section 10.2.1(a)(ii), and (ii) **[***]** on or prior to the **[***]** (**[***]**) anniversary of the effective date of termination (a "**Lilly Compound**"), then Lilly shall pay to Aduro [***]

12.4 **Surviving Provisions**. Termination or expiration of this Agreement for any reason shall be without prejudice to: (a) the survival of rights specifically stated in this Agreement to survive, including as set forth in this Section 12.4; (b) the rights and obligations of the Parties provided in Sections 2.1 (solely to the extent set forth in Section 12.1), 2.5, 4.4 (solely with respect to the licensee Party to the extent any licenses granted hereunder survive under Section 12.3.1(c) or 12.3.2(c)), 4.5 (solely to the extent required under Applicable Law), 8.3.5, 12.1 (second sentence only), 12.3, 12.5, 13.3, and 13.4 and Articles 1 (solely to the extent defined terms are used in any other surviving provisions), 8 (solely as set out in Section 12.3, and excluding, for clarity, Section 8.1), 9 (for clarity, with respect to 9.1, solely for the period set forth therein), 14 (excluding, solely with respect to Lilly's indemnification obligations hereunder, any Losses, claims, suits, actions, demands or judgments arising in connection with any Termination Product), and 15, all of which shall survive such termination or expiration, except as provided in this Article 12; and (c) any other rights or remedies provided at law or equity which either Party may otherwise have, except as otherwise expressly provided for in this Agreement.

12.5 **Termination CRE**. Solely for purposes of Sections 12.3.1(d) and (e) and Sections 12.3.2(b), (d), and (e), the term "Commercially Reasonable Efforts" as it applies to Lilly will be understood to mean, the effort, expertise and resources normally used by Lilly in the divestiture of a comparable pharmaceutical product controlled by Lilly which is of similar market potential at a similar stage of development or commercialization in light of issues of safety and efficacy, product profile, the competitiveness of the marketplace, the proprietary position of the compound,

platform, or product, the regulatory structure involved, the profitability of the applicable products, product reimbursement and other relevant strategic and commercial factors normally considered by Lilly in undertaking such a divestiture.

13. REPRESENTATIONS AND WARRANTIES

13.1 **Mutual Representations and Warranties**. Aduro and Lilly each represents and warrants to the other, as of the Effective Date, as follows:

13.1.1 Organization. It is a corporation or company duly organized, validly existing and in good standing under the laws of the jurisdiction of its organization, and has all requisite power and authority, corporate or otherwise, to execute, deliver and perform this Agreement.

13.1.2 Authorization. The execution and delivery of this Agreement and the performance by it of the transactions contemplated hereby have been duly authorized by all necessary corporate action and will not violate (a) such Party's certificate of incorporation or bylaws, (b) any agreement, instrument or contractual obligation to which such Party is bound in any material respect, (c) any requirement of any Applicable Laws or (d) any order, writ, judgment, injunction, decree, determination or award of any court or governmental agency presently in effect applicable to such Party.

13.1.3 Binding Agreement. This Agreement is a legal, valid and binding obligation of such Party, enforceable against it in accordance with its terms and conditions.

13.1.4 No Inconsistent Obligation. It is not under, and will not become subject to, any obligation, contractual or otherwise, to any Person that conflicts with or is inconsistent in any respect with the terms of this Agreement or that would impede the diligent and complete fulfillment of its obligations hereunder.

13.1.5 Absence of Debarment. Neither it, nor any of its officers, employees, subcontractors, representatives, agents, consultants or any other person used by either Party in the performance of the Research Activities has been or is (a) debarred, convicted, or is subject to a pending debarment or conviction, pursuant to Section 306 of the United States Food Drug and Cosmetic Act, 21 U.S.C. § 335a, (b) listed by any government or regulatory agencies as ineligible to participate in any government healthcare programs (as that term is defined in 42 U.S.C. § 1320a-7b(f)) or government procurement or non-procurement programs, or (c) convicted of a criminal offense related to the provision of healthcare items or services, or is subject to any such pending action. Each Party shall inform the other Party in writing promptly if such Party or any person who is performing Research Activities on behalf of such Party is subject to the foregoing, or if any action, suit, claim, investigation, or proceeding relating to the foregoing is pending, or to the best of such Party's Knowledge, is threatened.

13.2 **Additional Representations and Warranties of Aduro**. Aduro represents and warrants to Lilly, as of the Effective Date, as follows:

13.2.1 No Claims. There are no claims, judgments or settlements against Aduro pending, [***], threatened that invalidate or seek to invalidate the Aduro Patent Rights. [***], use of the Aduro Know-How and Aduro Patent Rights by Lilly in accordance with the terms of this Agreement, including Lilly's further Research, Development, Manufacturing or Commercialization of Products, will not infringe on the rights of any Third Party, including any Third Party intellectual property rights.

13.2.2 No Assignment. Aduro has not granted any right, license or interest in or to the Aduro Patent Rights or Aduro Know-How that is inconsistent with the licenses and rights granted to Lilly under this Agreement.

13.2.3 Ownership; Rights and Related Actions. Aduro is the sole and exclusive owner of the Aduro Know-How and the Aduro Patent Rights, and, in each case, has the ability to grant to Lilly the rights granted to Lilly under this Agreement, and such ownership is free and clear of all encumbrances, security interests, options and licenses. None of the Aduro Know-How or Aduro Patent Rights is subject to any existing royalty or other payment obligations to any Third Party under any agreement or understanding entered into by Aduro or its Affiliates.

13.2.4 Completeness. The intellectual property rights licensed to Lilly hereunder represents all of the intellectual property rights that are being used by Aduro or its Affiliates for the Research of Products.

13.2.5 No Interference. [***] the Aduro Patent Rights are not the subject of any interference proceeding and there is no pending or threatened action, suit, proceeding or claim by a Third Party challenging Aduro's ownership rights in, or the validity or scope of, the Aduro Patent Rights.

13.2.6 No Litigation. There is no claim, action, suit, proceeding, complaint or investigation pending before any court or administrative office or agency or, [***], currently threatened against Aduro or any of its Affiliates, with respect to any of the Aduro Patent Rights or Aduro Know-How.

13.2.7 No Third Party Infringement. Aduro has not initiated or been involved in any proceedings or claims in which it alleges that any Third Party is or was infringing or misappropriating any Aduro Patent Rights or Aduro Know-How nor have any such proceedings been threatened by Aduro. [***] no Person is infringing or threatening to infringe or misappropriating or threatening to misappropriate any of the Aduro Patent Rights or Aduro Know-How.

13.2.8 Assignment by Employees, Agents and Consultants. All employees and agents of, and consultants to, Aduro are obligated to assign to Aduro their rights in and to any inventions arising out of their work at Aduro either pursuant to written agreement or by operation of law.

13.2.9 Disclosure. Aduro has made available to Lilly all toxicology studies, clinical data, process and analytical development information, manufacturing process data, material filings and material correspondence with Regulatory Authorities, and all other material information in its possession or control relating to the cGAS-STING pathway, and, [***] all such information is complete and accurate in all material respects.

13.2.10 Confidentiality. Aduro has used [***] to protect the confidentiality of those parts of the Aduro Know-How that constitute confidential or proprietary information of Aduro.

13.3 **Warranty Disclaimer**. EXCEPT AS OTHERWISE EXPRESSLY PROVIDED IN THIS AGREEMENT, NEITHER PARTY MAKES ANY WARRANTY WITH RESPECT TO ANY KNOW-HOW, RIGHTS OR OTHER SUBJECT MATTER OF THIS AGREEMENT AND EACH PARTY HEREBY DISCLAIMS ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT.

13.4 **No Warranty of Success**. Nothing contained in this Agreement shall be construed as a warranty, either express or implied, on the part of either Party that (a) the Development or Commercialization of any Product or any Product will be successful or (b) any Product will be commercially exploitable in any respect.

14. INDEMNIFICATION

14.1 **Indemnification of Aduro by Lilly**. Lilly shall indemnify, defend and hold harmless Aduro, its Affiliates, their respective employees, directors, agents, officers and consultants, and their respective successors, heirs and assigns (collectively, the "**Aduro Indemnitees**"), against all liabilities, damages, losses and expenses (including reasonable attorneys' fees and expenses of litigation) (collectively, "**Losses**") incurred by or imposed upon the Aduro Indemnitees, resulting from claims, suits, actions, demands or judgments of Third Parties, including personal injury and Product liability claims (collectively, "**Aduro Indemnity Claims**"), arising out of:

14.1.1 the conduct by Lilly, any of its Affiliates, Sublicensees or Third Parties of Lilly Research Activities (including any violation of Applicable Laws);

14.1.2 the Research, Development, Manufacture or Commercialization of any Product by Lilly or any of its Affiliates, Sublicensees, distributors or agents in the Territory);

14.1.3 any material breach of this Agreement (including any representation or warranty hereunder) by Lilly or any Lilly Indemnitee;

14.1.4 the gross negligence or willful misconduct of Lilly or any Lilly Indemnitee; or

14.1.5 any Third Party's claim that Aduro's practice of Lilly Patent Rights or Lilly Know-How in the performance of the Aduro Research Activities in the Field in accordance with this Agreement infringes such Third Party's proprietary intellectual property rights;

except, in each case, to the extent Aduro is obligated to indemnify the Lilly Indemnitees pursuant to Section 14.2.

14.2 **Indemnification of Lilly by Aduro**. Aduro shall indemnify, defend and hold harmless Lilly, its Affiliates, their respective employees, directors, agents, officers and consultants, and their respective successors, heirs and assigns (collectively, the "**Lilly Indemnitees**"), against all Losses incurred by or imposed upon the Lilly Indemnitees, or any of them, resulting from claims, suits, actions, demands or judgments of Third Parties, including personal injury and Product liability claims (collectively, "**Lilly Indemnity Claims**") arising out of:

14.2.1 the conduct by Aduro or any of its Affiliates, sublicensees or Third Parties of Aduro Research Activities (including any violation of Applicable Laws);

14.2.2 any material breach of this Agreement (including any representation or warranty hereunder) by Aduro or any Aduro Indemnitee;

14.2.3 the gross negligence or willful misconduct of Aduro or any Aduro Indemnitee; or

14.2.4 the Research, Development, Manufacture or Commercialization of any Termination Product by or on behalf of Aduro or any of its Affiliates, (sub)licensees, distributors or agents in the Territory;

except, in each case, to the extent Lilly has an obligation to indemnify any Aduro Indemnitees pursuant to Section 14.1.

14.3 **Conditions to Indemnification**. A Person seeking Recovery under this Article 14 (the "**Indemnified Party**") in respect of a Claim shall give prompt notice of such Claim to the Party from whom indemnification is sought (the "**Indemnifying Party**"). Provided that the Indemnifying Party is not contesting its obligation under this Article 14, the Indemnified Party shall permit the Indemnifying Party to control any litigation relating to such Claim and the disposition of such Claim. The Indemnifying Party shall (a) act reasonably and in good faith with respect to all matters relating to the settlement or disposition of such Claim as the settlement or disposition relates to such Indemnified Party and (b) not settle or otherwise resolve such claim without the prior written consent of such Indemnified Party (which consent shall not be unreasonably withheld, conditioned or delayed) unless such settlement fully releases the Indemnified Party without any liability, loss, cost or obligation incurred by the Indemnified Party (in which case prior consent shall not be required). Each Indemnified Party shall cooperate with the Indemnifying Party in its defense of any such Claim in all reasonable respects and shall have the right to be present in person or through counsel at all legal proceedings with respect to such Claim (with any such counsel being at its own sole cost and expense). If the Indemnifying Party does not assume and conduct the defense of the Claim as provided above, (i) the Indemnified Party may defend against, consent to the entry of any judgment, or enter into any settlement with respect

to such Claim in any manner the Indemnified Party may deem reasonably appropriate (and the Indemnified Party need not consult with, or obtain any consent from, the Indemnifying Party in connection therewith) and (ii) the Indemnifying Party shall remain responsible to indemnify the Indemnified Party as provided in this Article 14.

14.4 **Limited Liability**. NEITHER PARTY NOR ANY OF ITS AFFILIATES WILL BE LIABLE FOR ANY SPECIAL, PUNITIVE, INDIRECT, INCIDENTAL, CONSEQUENTIAL, REMOTE, SPECULATIVE OR OTHER DAMAGES WHETHER OR NOT PROBABLE OR REASONABLY FORESEEABLE, OR LOST PROFITS OR LOST REVENUES, REGARDLESS OF ANY NOTICE OF THE POSSIBILITY OF SUCH DAMAGES. NOTWITHSTANDING THE FOREGOING, (1) NOTHING IN THIS SECTION 14.4 IS INTENDED TO OR SHALL LIMIT OR RESTRICT DAMAGES PAID OR PAYABLE IN CONNECTION WITH THE INDEMNIFICATION RIGHTS OR OBLIGATIONS OF ANY PARTY UNDER SECTION 14.1 OR 14.2 FOR AMOUNTS PAID TO THIRD PARTIES, FOR A BREACH OF SECTION 9.1, OR IN THE CASE OF GROSS NEGLIGENCE, WILLFUL MISCONDUCT OR FRAUD, AND (2) A PARTY OR ITS AFFILIATE, AS APPLICABLE, SHALL BE ENTITLED TO RECOVER ALL AMOUNTS ACCRUED AND OWING UNDER THIS AGREEMENT.

14.5 **Insurance**. Each Party shall procure and maintain insurance (which, in the case of Lilly, may take the form of self-insurance), including product liability insurance, with respect to its activities hereunder and which are consistent with normal business practices of prudent companies similarly situated at all times during which any Collaboration Compound is being clinically tested in human subjects or commercially distributed or sold. Each Party shall provide the other Party with written evidence of such insurance upon reasonable request therefor from time-to-time. Each Party shall provide the other Party with written notice at least **[***]** (**[***]**) days prior to the cancellation, non-renewal or material change in such insurance or self-insurance, as applicable, which materially adversely affects the rights of the other Party hereunder.

15. MISCELLANEOUS

15.1 **Governing Law**. This Agreement shall be governed by and construed in accordance with the laws of the State of [***], without regard to the application of principles of conflicts of law.

15.2 **Dispute Resolution**.

15.2.1 In the event of any dispute arising under this Agreement between the Parties, either Party shall have a right to refer such dispute to the respective Executive Officers, and such Executive Officers shall attempt in good faith to resolve such dispute. If the Parties are unable to resolve a given dispute pursuant to this Section 15.2 within **[***]** (**[***]**) days of referring such dispute to the Executive Officers, any such dispute shall be resolved pursuant to Section 15.2.2; provided that disputes that are subject to a Party's final decision-making authority pursuant to Section 3.7 shall not be subject to the dispute resolution procedures in Section 15.2.2 and not subject to further dispute resolution, whether in a court of law, equity or otherwise. THE PARTIES EXPRESSLY WAIVE AND FOREGO ANY RIGHT TO TRIAL BY JURY.

15.2.2 In the event a dispute arising under this Agreement between the Parties remains unresolved within **[***]** (**[***]**) days of such dispute being referred to the Executive Officers, each Party reserves its right to any and all remedies available under Applicable Laws or equity with respect to such dispute. Each Party irrevocably submits to the exclusive jurisdiction of the United States District Court for the Southern District of New York for the purposes of any suit, action or other proceeding arising out of this Agreement and subject to this Section 15.2.2. Each Party agrees to commence any such action, suit or proceeding in the United States District Court for the Southern District of New York or if such suit, action or other proceeding may not be brought in such court for jurisdictional reasons, in the Supreme Court of the State of New York, New York County. Each Party irrevocably and unconditionally waives any objection to the laying of venue of any such action, suit or proceeding arising out of this Agreement in the United States District Court for the Southern District of New York, and hereby and thereby further irrevocably and unconditionally waives and agrees not to plead or claim in any such court that any such action, suit or proceeding brought in any such court has been brought in an inconvenient forum.

15.2.3 **[***]**.

15.3 **Equitable Relief**. Notwithstanding anything to the contrary, each of the Parties hereby acknowledges that a breach or threatened breach of their respective obligations under this Agreement may cause irreparable harm and that the remedy or remedies at law for any such breach may be inadequate. Each of the Parties hereby agrees that, in the event of any such breach or threatened breach, in addition to all other available remedies hereunder, the non-breaching Party shall have the right, to seek equitable relief to enforce the provisions of this Agreement.

15.4 **Notices**. All notices and communications permitted or required under this Agreement shall be in writing and delivered personally or by nationally recognized overnight express courier providing evidence of delivery either addressed as follows below, or by email or facsimile confirmed thereafter by any of the foregoing, or to such other address as may be designated from time to time.

If to Lilly:
Eli Lilly and Company
Lilly Corporate Center
Indianapolis, Indiana 46285
Attention: General Patent Counsel
Fax:317-433-3000

With a copy to:
Eli Lilly and Company
Lilly Corporate Center
Indianapolis, Indiana 46285
Attention: Senior Vice President Business Development
Fax: 317-651-3051

If to Aduro:
Aduro Biotech, Inc.
740 Heinz Avenue
Berkeley, California 94710
Attention: Legal Department
Tel.: 510-809-9289

[***] Certain information in this document has been omitted and filed separately with the Securities and Exchange Commission. Confidential treatment has been requested with respect to the omitted portions.

With a copy to: Arnold & Porter Kaye Scholer LLP
601 Massachusetts Avenue NW
Washington, District of Columbia 20001
Attention: Kristen Riemenschneider
Tel.: 202-942-6763

Notices delivered in accordance with this Section 15.4 shall be deemed delivered on receipt if received on a Business Day before 5pm at the location of delivery or if after 5pm, then on the following Business Day.

15.5 **Binding Effect**. This Agreement shall be binding upon and inure to the benefit of the Parties and their respective legal representatives, successors and permitted assigns.

15.6 **Headings**. Section and subsection headings are inserted for convenience of reference only and do not form a part of this Agreement.

15.7 **Counterparts**. This Agreement may be executed simultaneously in two or more counterparts, each of which shall be deemed an original and both of which, together, shall constitute a single agreement. Each Party may execute this Agreement by facsimile transmission or in Adobe™ Portable Document Format ("**PDF**") sent by electronic mail. In addition, facsimile or PDF signatures of authorized signatories of any Party will be deemed to be original signatures and will be valid and binding, and delivery of a facsimile or PDF signature by any Party will constitute due execution and delivery of this Agreement.

15.8 **Amendment; Waiver**. This Agreement may be amended, modified, superseded or canceled, and any of the terms of this Agreement may be waived, only by a written instrument executed by each Party or, in the case of waiver, by the Party or Parties waiving compliance. The delay or failure of either Party at any time or times to require performance or to exercise any right arising out of any provisions shall in no manner affect the rights at a later time to enforce the same. Any waiver by a Party of a particular provision or right shall be in writing, shall be as to a particular matter and, if applicable, for a particular period of time and shall be signed by such Party. No single or partial exercise of any right, power or privilege will preclude any other or further exercise of such right, power or privilege or the exercise of any other right, power or privilege. No waiver by either Party of any condition or of the breach of any term contained in this Agreement, whether by conduct, or otherwise, in any one or more instances, shall be deemed to be, or considered as, a further or continuing waiver of any such condition or of the breach of such term or any other term of this Agreement. Except as expressly set forth in this Agreement, all rights and remedies available to a Party, whether under this Agreement or afforded by Applicable Law or otherwise, will be cumulative and not in the alternative to any other rights or remedies that may be available to such Party.

15.9 **Purposes and Scope**. The Parties hereto understand and agree that the relationship between the Parties described in this Agreement is limited to the activities, rights and obligations as set forth in this Agreement. Nothing in this Agreement shall be construed (a) to create or imply a general partnership between the Parties, (b) to make either Party the agent of the other for any purpose, (c) to alter, amend, supersede or vitiate any other arrangements between the Parties with

respect to any subject matter not covered hereunder, (d) to give either Party the right to bind the other, (e) to create any duties or obligations between the Parties except as set forth herein or (f) to grant any direct or implied licenses or any other rights other than as set forth herein.

15.10 **Assignment and Successors; Change of Control**.

15.10.1 Generally. Neither this Agreement nor any obligation of a Party hereunder may be assigned by either Party without the written consent of the other Party which consent shall not be unreasonably withheld, conditioned or delayed, except that each Party may assign this Agreement and the rights, obligations and interests of such Party, (a) in whole or in part, to any of its Affiliates, or (b) in whole, but not in part, in connection with a Change of Control of such Party (whether this Agreement is actually assigned or is assumed by the acquiring party by operation of law (*e.g.*, in the context of a reverse triangular merger in the United States), in which event, subject to Aduro complying with Section 15.10.3 if applicable, the provisions of Section 2.3 shall not apply to the acquiring party as of the effective date of the Change of Control)). If either Party assigns this Agreement pursuant to this Section 15.10.1, it shall promptly notify the other Party in writing of such assignment within **[***]** (**[***]**) Business Days. In no event may Lilly assign this Agreement prior to the end of the Initial Exclusivity Term.

15.10.2 No Diminution of Rights. Subject to the terms and conditions hereof, no right of a Party shall be diminished and no obligation of a Party shall be increased as a result of an assignment by the other Party hereunder, including as a result of a Change of Control of the other Party. This Agreement is intended for the benefit of the Parties and their respective successors and permitted assigns, and is not for the benefit of, nor may any provision hereof be enforced by, any other Person, other than the Parties and their respective successors and permitted assigns.

15.10.3 Aduro Change of Control. In the event of a Change of Control of Aduro during the Term, where the acquirer is a company that is Researching, Developing or Commercializing a Competing Product (the "**Competing Acquirer**"), Aduro shall provide notice to Lilly of such Change of Control by the Competing Acquirer (the "**Competing Acquisition**") within **[***]** (**[***]**) Business Days after the date upon which the Change of Control closes or otherwise becomes effective, and the following shall apply:

(a) [***]

(b) *Intellectual Property*. Without limiting Section 15.10.3(a) and subject to compliance with this Section 15.10.3 (as applicable), the following intellectual property shall be excluded from the Aduro Know-How or Aduro Patent Rights for purposes of this Agreement: (i) the intellectual property Controlled by such Competing Acquirer immediately prior to the consummation of such Change of Control transaction (other than as a result of a license from Aduro), and (ii) the intellectual property Controlled by such Competing Acquirer following the consummation of such Change of Control transaction (other than as a result of a license from Aduro); provided that such Competing Acquirer intellectual property is not used or applied in the activities under this Agreement, and remains firewalled from the activities performed under this Agreement, at all times after such consummation.

(c) *Rights to Assume Conduct of Aduro Research Activities*. Lilly will have the right, upon written notice to Aduro no later than **[***]** (**[***]**) days from the date that Lilly receives such notice of the closing or effectiveness of such Competing Acquisition, to take over the conduct of all, or a designated portion (at Lilly's sole discretion) of the remaining Aduro Research Activities, outside the authority of the JRC, at Lilly's own cost and expense. Notwithstanding Lilly taking over such activities, it shall remain responsible for all milestones and royalties with respect to Products as provided for in this Agreement, Aduro shall have no liability for any performance of the Aduro Research Activities by or on behalf of Lilly, and all other terms and conditions of this Agreement remain in full force and effect.

(d) *Limitation on Information*. Following such Change of Control, Lilly shall have the right to (i) limit the information or reports otherwise required to be provided to Aduro or the JRC hereunder to only that which is essential to ensure Aduro's compliance with its obligations hereunder and Lilly shall have the right to refrain from including in such information or reports commercially sensitive information of Lilly (as Lilly may determine in its sole discretion), and (ii) in the event Lilly exercises its rights under Section 15.10.3(c), Lilly may cause Aduro (or the Competing Acquirer) to assign (or otherwise provide the full benefit of) any agreement(s) between Aduro and any Third Party(ies) related to the Research, Development, Manufacture, Commercialization or other exploitation of the Product that existed prior to the consummation of such Competing Acquisition. Without limiting the foregoing, in the event that either Party has a good faith concern that sharing of information following such Change of Control is prohibited under Applicable Law, the Parties shall promptly meet to discuss such concern.

15.11 **Force Majeure**. Neither Lilly nor Aduro shall be liable for failure of or delay in performing obligations set forth in this Agreement, and neither shall be deemed in breach of its obligations, if such failure or delay is due to a Force Majeure. In the event of such Force Majeure, the Party affected shall use Commercially Reasonable Efforts to cure or overcome the same and resume performance of its obligations hereunder. Notice of a Party's failure or delay in performance due to Force Majeure must be given to the other Party within **[***]** (**[***]**) days after its occurrence. All delivery dates under this Agreement that have been affected by Force Majeure shall be tolled for the duration of such Force Majeure. If a Force Majeure persists for more than **[***]** (**[***]**) days, then the Parties will discuss in good faith whether the modification of the Parties' obligations under this Agreement in order to mitigate the delays caused by such Force Majeure is appropriate given the totality of circumstances surrounding the Agreement and the Force Majeure.

15.12 **Interpretation**. The Parties hereto acknowledge and agree that: (a) each Party and its counsel reviewed and negotiated the terms and provisions of this Agreement and have contributed to its revision; (b) the rules of construction to the effect that any ambiguities are resolved against the drafting Party shall not be employed in the interpretation of this Agreement; and (c) the terms and provisions of this Agreement shall be construed fairly as to each Party and not in a favor of or against either Party, regardless of which Party was generally responsible for the preparation of this Agreement. In addition, unless a context otherwise requires, wherever used, the singular shall include the plural, the plural the singular, the use of any gender shall be applicable to all genders, the word "or" is used in the inclusive sense (and/or) and the word "including" is used without limitation and means "including without limitation". Unless otherwise specified, references in this Agreement to any Article shall include all Sections, subsections and

paragraphs in such Article, references to any Section shall include all subsections and paragraphs in such Section, and references in this Agreement to any subsection shall include all paragraphs in such subsection. The words "herein," "hereof" and "hereunder" and other words of similar import refer to this Agreement as a whole and not to any particular Section or other subdivision. The phrase "non-refundable, non-creditable" is not intended to limit either Party's rights to pursue or obtain damages arising from a breach of this Agreement. All references to days in this Agreement shall mean calendar days, unless otherwise specified. Unless the context requires otherwise, (i) any definition of or reference to any agreement, instrument or other document herein will be construed as referring to such agreement, instrument or other document as from time to time amended, supplemented or otherwise modified (subject to any restrictions on such amendments, supplements or modifications set forth herein or therein), (ii) any reference to any Applicable Laws herein will be construed as referring to such Applicable Laws as from time to time enacted, repealed or amended, (iii) any reference herein to any person will be construed to include the person's successors and permitted assigns, (iv) any reference herein to the words "mutually agree" or "mutual written agreement" will not impose any obligation on either Party to agree to any terms relating thereto or to engage in discussions relating to such terms except as such Party may determine in such Party's sole discretion, (v) all references herein to Sections or Schedules will be construed to refer to Sections and Schedules to this Agreement, (vi) except as otherwise expressly provided herein all references to "$" or "dollars" refer to the lawful money of the U.S., and (vii) the words "copy" and "copies" and words of similar import when used in this Agreement include, to the extent available, electronic copies, files or databases containing the information, files, items, documents or materials to which such words apply. This Agreement has been prepared in the English language and the English language shall control its interpretation. In addition, all notices required or permitted to be given hereunder, and all written, electronic, oral or other communications between the Parties regarding this Agreement shall be in the English language.

15.13 **Integration; Severability**. This Agreement sets forth the entire agreement with respect to the subject matter hereof and thereof and supersede all other agreements and understandings between the Parties with respect to such subject matter. There are no covenants, promises, agreements, warranties, representations, conditions or understandings, either oral or written, between the Parties with respect to the subject matter of this Agreement other than as are set forth in this Agreement and any other documents delivered pursuant hereto or thereto. If any provision of this Agreement is or becomes invalid or is ruled invalid by any court of competent jurisdiction or is deemed unenforceable, it is the intention of the Parties that the remainder of the Agreement shall not be affected.

15.14 **Further Assurances**. Each of Aduro and Lilly, upon the request of the other Party, whether before or after the Effective Date and without further consideration (except as specifically provided in this Agreement), will do, execute, acknowledge, and deliver or cause to be done, executed, acknowledged or delivered all such further acts, deeds, documents, assignments, transfers, conveyances, powers of attorney, instruments and assurances as may be reasonably necessary to effect complete consummation of the transactions contemplated by this Agreement, and to do all such other acts, as may be reasonably necessary in order to carry out the purposes and intent of this Agreement. The Parties agree to execute and deliver such other documents, certificates, agreements and other writings and to take such other actions as may be reasonably necessary in order to consummate or implement expeditiously the transactions contemplated by this Agreement.

15.15 **Expenses**. Each of the Parties will bear its own direct and indirect expenses incurred in connection with the negotiation and preparation of this Agreement and, except as set forth in this Agreement, the performance of the obligations contemplated hereby and thereby.

15.16 **Intellectual Property**. The Parties acknowledge and agree that the licenses granted by the Parties and all other rights granted under or pursuant to this Agreement are and shall otherwise be deemed to be, for purposes of Section 365(n) of the Bankruptcy Code (or analogous provisions of the bankruptcy laws of any Governmental Authority), licenses of rights to "intellectual property" as defined under Section 101(35A) of the Bankruptcy Code (or analogous foreign provisions), and that this Agreement is an executory contract governed by Section 365(n) of the Bankruptcy Code (or analogous foreign provisions) in the event that a bankruptcy proceeding is commenced involving either Party. Lilly, as the licensee of such rights under Section 2.1, shall retain and may fully exercise all of its rights and elections under the Bankruptcy Code. The foregoing provisions of this Section 15.16 are without prejudice to any rights the Parties may have arising under the Bankruptcy Code or other Applicable Laws.

15.17 **Performance by Affiliates**. Lilly may discharge any obligation and exercise any right hereunder through any of its Affiliates. Lilly hereby guarantees the performance by its Affiliates of such obligations under this Agreement, and shall cause its Affiliates to comply with the provisions of this Agreement in connection with such performance. Any breach by an Affiliate of Lilly of any of Lilly's obligations under this Agreement shall be deemed a breach by Lilly, and Aduro may proceed directly against Lilly without any obligation to first proceed against such Affiliate.

15.18 **Other Activities**. The Parties acknowledge that, except as expressly provided in this Agreement, each of them may now or in the future engage in research, manufacturing, development or commercialization activities that utilize technologies similar to or involve products competitive with those contemplated by this Agreement. The Parties acknowledge that, except as expressly provided in this Agreement, each of them may now or in the future engage in research, manufacturing, development or commercialization activities that utilize technologies similar to or involve products competitive with those contemplated by this Agreement. Except as may be expressly provided in this Agreement, nothing in this Agreement, including any obligation to promote Products or any restriction on the use of Confidential Information, shall create any obligation to utilize a separate sales force for Products from that used for other products. Subject to the exclusivity provisions of Section 2.3 (as applicable), neither Party shall be prevented from using any publicly available research results or other information (including any publicly available information of the other Party) to the same extent as Third Parties generally are legally permitted to do so. Each Party agrees that the other Party has limited resources, and as a result it is anticipated that personnel assigned to the activities contemplated by this Agreement may also participate in other activities that may utilize technologies similar to or involve products competitive with those contemplated by this Agreement. In particular, it is anticipated that personnel in sales, marketing, clinical and regulatory functions, regardless of level, will participate in multiple programs and that management personnel will by nature of their leadership positions participate in multiple programs.

[*SIGNATURE PAGE FOLLOWS*]

[*Signature Page to Research Collaboration and Exclusive License Agreement*]

[***] Certain information in this document has been omitted and filed separately with the Securities and Exchange Commission. Confidential treatment has been requested with respect to the omitted portions.

IN WITNESS WHEREOF, the Parties have caused this Agreement to be executed by their duly authorized representatives as of the Effective Date.

ELI LILLY AND COMPANY

By:	/s/ Daniel Skovronsky
Name:	Daniel Skovronsky, MD, PhD
Title:	Sr VP-Chief Scientific Officer/ President-Lilly Research Labs

ADURO BIOTECH, INC.

By:	/s/ Stephen T. Isaacs
Name:	Stephen T. Isaacs
Title:	Chairman, President and Chief Executive Officer

[***] Certain information in this document has been omitted and filed separately with the Securities and Exchange Commission. Confidential treatment has been requested with respect to the omitted portions.

SCHEDULE 1.22

CANDIDATE SELECTION CRITERIA

[***]

[***] Certain information in this document has been omitted and filed separately with the Securities and Exchange Commission. Confidential treatment has been requested with respect to the omitted portions.

SCHEDULE 1.54

ELI LILLY AND COMPANY ANIMAL CARE AND USE REQUIREMENTS FOR ANIMAL RESEARCHERS AND SUPPLIERS

Lilly recognizes that we have an ethical and scientific obligation to ensure the appropriate treatment of animals used in research. We expect all organizations with which we contract for animal research or supply to comply with all applicable country and local regulations dealing with the appropriate use and care for animals. We also expect Third Party organizations to apply the Lilly Principles for animal care and use.

Lilly also actively encourages animal research and animal supply companies, both inside and outside the United States, to obtain and maintain accreditation from the Association for Assessment and Accreditation of Laboratory Animal Care (AAALAC). Through active engagement, Lilly is helping to raise the standards of animal care and use in countries that have not had such standards or enforced them. These principles are internationally recognized standards for appropriate animal care and use. Lilly is requesting assurance that all Third Party suppliers of animal research or animals read, understand and comply with this Appendix.

1. **Compliance**. Lilly expects all individuals and organizations with which Lilly contracts for animal research services ("**Researchers**"), or the supply of animals to be used in Lilly research ("**Suppliers**"), to do the following for each location at which Researchers and Suppliers use or hold animals:

    a. comply with all applicable country and local laws, regulations, and standards regarding the care and use of animals,

    b. comply with the Lilly animal care and use principles stated below even if they impose requirements beyond the applicable local legal requirements,

    c. establish a mechanism to assess compliance with such laws, regulations, standards, and the Lilly principles stated below, and

    d. regularly assess and report to its management the status of compliance with these requirements.

2. **Lilly Principles for Animal Care and Use**.

    a. Animal Care. Researchers and Suppliers must provide living conditions for research animals that are appropriate for their species and contribute to their health and well-being. Personnel who care for animals or who conduct animal studies must be appropriately qualified regarding the proper care and use of animals in research.

    b. Studies. Researchers must assure that studies involving animals are designed and conducted in accordance with both:

(i) applicable country and local regulatory guidance, and

(ii) the following widely recognized principles of animal care and use:

- with due consideration of the relevance of the study to human or animal health and the advancement of scientific knowledge
- selecting only animals appropriate for that study
- using only the minimum number of animals required to obtain valid results
- using alternative methods instead of live animals when appropriate
- avoiding or minimizing discomfort and distress to the animals.

3. **Reporting**. Researchers and Suppliers must report to Lilly any animal welfare issues or concerns that may affect the welfare of animals or validity of the testing being conducted. This would include but is not limited to any animal illness, disease outbreaks, or any significant (*i.e.*, reportable to a government authority) non-compliance with any country or local animal welfare laws, regulations, or standards, or the Lilly principles stated above.

4. **Audits/Monitoring**. Lilly has the discretion to periodically assess Researchers' and Suppliers' animal use, care, and welfare in accordance with the auditing/monitoring provisions stated in the contract.

SCHEDULE 1.73

GOOD RESEARCH PRACTICES

Lilly's quality standards, along with the high level expectations for each standard, are listed below:

1.0 Governance

1.1	**Facilities**	Senior management must ensure that the facility is suitable for the intended use, is adequately protected for the work that is to be performed, and that risk to continuation of the business has been identified and minimized in order to restore normal business operation.
1.2	**Adherence**	Senior management must also establish processes to enable adherence to GRPs and assure that monitoring of adherence to the GRPs occurs.
2.0	**GRP Principles**	
2.1	**Accountability**	Scientists, supervision, management, and support personnel are all owners of and accountable for Good Research Practices.
2.2	**Qualifications**	Individuals must have documented training, education, and/or experience to perform the task required by their current roles.
2.3	**Test Materials**	Test materials must be identified, characterized, and stored properly to ensure that they are suitable for the intended research purpose.
2.4	**Equipment**	Laboratory equipment used to generate research data must be maintained, verified, and calibrated.
2.5	**Computer Systems**	Users of the computer systems which are used to generate, manage, store or analyze data must provide assurance that the systems are working as intended.
2.6	**In Vitro Assays**	The optimization, validation, and data analysis of *in vitro* assays must be performed in a manner that follows scientific and statistical principles, including Design and Optimization, Validation, Analysis, and Analysis Comparison and Correlation.
2.7	**In Vivo Assays**	The optimization, validation, and data analysis of *in vivo* assays must be performed in a manner that follows scientific and statistical principles, including Design and Optimization, Validation, and Analysis.
2.8	**Documentation**	All experimental procedures, observations, data, and results must be promptly and accurately recorded or referenced in laboratory notebooks and/or data binders to ensure data integrity.
2.9	**Record Retention**	All notebooks and related research materials must be securely maintained and archived.
2.10	**Research Reports**	Research reports must be prepared according to appropriate quality standards and reviewed to ensure integrity.

SCHEDULE 1.93

LEAD SELECTION CRITERIA

The decision to move any newly identified hits or series into Lead Candidate Evaluation & Validation phase will be based on the **[***]**.

Lead declaration criteria:

Medicinal Chemistry:

- **[***]**
- **[***]**
- **[***]**

Pharmacology:

- **[***]**
- **[***]**.

MOA:

- **[***]**
- **[***]** :
    - **[***]**
    - **[***]**
    - **[***]**
- **[***]**
- **[***]**

ADME PK/PD:

- **[***]**
- **[***]**
- **[***]**
- **[***]**

Toxicology:

- **[***]**
    - **[***]**
    - **[***]**

Schedule 1.93

SCHEDULE 1.124

INITIAL POTENTIAL COLLABORATION COMPOUNDS

Aduro Potential Collaboration Compounds:[***]

[***] Certain information in this document has been omitted and filed separately with the Securities and Exchange Commission. Confidential treatment has been requested with respect to the omitted portions.

Lilly Potential Collaboration Compounds:

[***]

Schedule 1.124

[***] Certain information in this document has been omitted and filed separately with the Securities and Exchange Commission. Confidential treatment has been requested with respect to the omitted portions.

SCHEDULE 1.141

RESEARCH PLAN

[***]

[***] Certain information in this document has been omitted and filed separately with the Securities and Exchange Commission. Confidential treatment has been requested with respect to the omitted portions.

SCHEDULE 9.4

MATERIALS TRANSFER RECORD

The material/compound(s) described below (the "Proprietary Material") is/are being supplied by _____ to _____. For clarity, defined terms used herein and not defined herein have the meanings ascribed to such terms in the Agreement. This Schedule may be executed in one or more counterparts, including by facsimile or PDF exchange, each of which shall be deemed to be an original as against any party whose signature appears thereon, but all of which together shall constitute but one and the same instrument.

Description of Proprietary Material(s): _____

_____

_____

The Parties agree that Proprietary Material shipped in conjunction with the performance of their respective obligations under the Agreement shall be delivered DAP [insert receiving party's city/state] (Incoterms® 2010). Each Party shall timely provide such information or assistance as is reasonably requested by the other Party to complete its obligations under this transfer record, including providing information necessary to facilitate an import or export which is not reasonably ascertainable by the importing or exporting party through other means.

When shipment by express consignment courier (*e.g.*, FedEx, DHL Express, etc.) is preferred, each Party shall ship Proprietary Material or other goods, if applicable, at its own expense, using an express consignment courier ("Courier") agreed to by the other Party. The shipping Party shall provide to the Courier for each article in the shipment documentation, as appropriate, that includes: (i) detailed description; (ii) six-digit tariff code from the Harmonized Tariff Schedule, if applicable; (iii) statement of intended use; (iv) fair value; (v) country of origin, if applicable; (vi) name and address of manufacturer if different than shipper; (vii) contact information for both the sender and receiver of the shipment; and (viii) other information or documentation as required by the Courier to effect any necessary export and import clearances and enable transportation to the receiving Party's designated facility.

In signing below, the authorized representative of each Party acknowledges on behalf of such Party that they understand and will abide by the terms and conditions under which the Proprietary Material(s) is/are provided.

Lilly Representative Signature	Aduro Representative Signature
Lilly Representative Name	Aduro Representative Name
Date	Date

[***] Certain information in this document has been omitted and filed separately with the Securities and Exchange Commission. Confidential treatment has been requested with respect to the omitted portions.

SCHEDULE 12.3

[***]

[***] Certain information in this document has been omitted and filed separately with the Securities and Exchange Commission. Confidential treatment has been requested with respect to the omitted portions.

Exhibit 10.42

AMENDMENT NO. 1 TO SALES AGREEMENT

February 27, 2019

Cowen and Company, LLC
599 Lexington Avenue
New York, NY 10022

Ladies and Gentlemen:

Aduro Biotech, Inc. (the "**Company**"), and Cowen and Company, LLC ("**Cowen**"), are parties to that certain Sales Agreement dated August 2, 2017 (the "**Original Agreement**"). All capitalized terms not defined herein shall have the meanings ascribed to them in the Original Agreement. The parties, intending to be legally bound, hereby amend the Original Agreement as follows:

1. With respect to issuances of Placement Shares that occur on or after the date of this Amendment No. 1 to Sales Agreement, reference to the "Current Registration Statement" in the Original Agreement shall refer to the registration statement on Form S-3 (File No. 333-219639), as amended, originally filed with the Securities and Exchange Commission on August 2, 2017.

2. Section 5(a) of the Original Agreement is hereby deleted in its entirety and replaced with the following:

"Settlement of Placement Shares. Unless otherwise specified in the applicable Placement Notice, settlement for sales of Placement Shares will occur on the second (2nd) Trading Day (or such earlier day as is industry practice for regular-way trading) following the date on which such sales are made (each, a "**Settlement Date**" and the first such settlement date, the "**First Delivery Date**"). The amount of proceeds to be delivered to the Company on a Settlement Date against receipt of the Placement Shares sold (the "**Net Proceeds**") will be equal to the aggregate sales price received by Cowen at which such Placement Shares were sold, after deduction for (i) Cowen's commission, discount or other compensation for such sales payable by the Company pursuant to Section 2 hereof, (ii) any other amounts due and payable by the Company to Cowen hereunder pursuant to Section 7(g) (Expenses) hereof, and (iii) any transaction fees imposed by any governmental or self-regulatory organization in respect of such sales."

3. The first paragraph in the section entitled "Notices" on page 26 of the Original Agreement is hereby deleted in its entirety and replaced with the following:

"Notices. All notices or other communications required or permitted to be given by any party to any other party pursuant to the terms of this Agreement shall be in writing, unless otherwise specified in this Agreement, and if sent to Cowen, shall be delivered to

Cowen at Cowen and Company, LLC, 599 Lexington Avenue, New York, NY 10022, fax no. 646-562-1124, Attention: General Counsel with a copy to Duane Morris LLP, 1540 Broadway, New York, New York 10036, attention: James T. Seery, e-mail jtseery@duanemorris.com; or if sent to the Company, shall be delivered to Aduro Biotech, Inc., 740 Heinz Avenue, Berkeley, CA 94710, attention: Celeste Ferber, e-mail: cferber@aduro.com, with a copy to Latham & Watkins LLP, 140 Scott Drive, Menlo Park, CA 94025, attention: Kathleen M. Wells, e-mail: kathleen.wells@lw.com. Each party to this Agreement may change such address for notices by sending to the parties to this Agreement written notice of a new address for such purpose. Each such notice or other communication shall be deemed given (i) when delivered personally, by email or by verifiable facsimile transmission (with an original to follow) on or before 4:30 p.m., New York City time, on a Business Day (as defined below), or, if such day is not a Business Day on the next succeeding Business Day, (ii) on the next Business Day after timely delivery to a nationally-recognized overnight courier, (iii) on the Business Day actually received if deposited in the U.S. mail (certified or registered mail, return receipt requested, postage prepaid) and (iv) if sent by e-mail, on the Business Day on which receipt is confirmed by the individual to whom the notice is sent, other than via auto-reply. For purposes of this Agreement, "**Business Day**" shall mean any day on which the Nasdaq and commercial banks in the City of New York are open for business."

4. Schedule 2 to the Original Agreement is hereby amended by (a) deleting "Gregory W. Schafer, Chief Operating Officer, gschafer@aduro.com," (b) deleting "Jennifer Lew, Senior VP, Finance, jlew@aduro.com" and replacing it with "Jennifer Lew, Chief Financial Officer, jlew@aduro.com" and (c) deleting "Robert Sine, Managing Director, robert.sine@cowen.com" and replacing it with "Michael J. Murphy, Director, michael.murphy@cowen.com."

5. All references to "August 2, 2017" set forth in Schedule I and Exhibit 7(m) of the Original Agreement are revised to read "August 2, 2017 (as amended by Amendment No. 1 to Sales Agreement, dated February 27, 2019)".

6. Except as specifically set forth herein, all other provisions of the Original Agreement shall remain in full force and effect.

7. This Amendment No. 1 to Sales Agreement together with the Original Agreement (including all schedules and exhibits attached hereto and thereto and Placement Notices issued pursuant hereto and thereto) constitutes the entire agreement and supersedes all other prior and contemporaneous agreements and undertakings, both written and oral, among the parties hereto with regard to the subject matter hereof. Neither this Amendment No. 1 to Sales Agreement nor any term hereof may be amended except pursuant to a written instrument executed by the Company and Cowen. In the event that any one or more of the provisions contained herein, or the application thereof in any circumstance, is held invalid, illegal or unenforceable as written by a court of competent jurisdiction, then such provision shall be given full force and effect to the fullest possible extent that it is valid, legal and enforceable, and the remainder of the terms and provisions herein shall be construed as if such invalid, illegal or unenforceable term or provision was not contained herein, but only to the extent that giving effect to such provision and the remainder of the terms and provisions hereof shall be in accordance with the intent of the parties

as reflected in this Amendment No. 1 to Sales Agreement. All references in the Original Agreement to the "Agreement" shall mean the Original Agreement as amended by this Amendment No. 1 to Sales Agreement; *provided, however*, that all references to "date of this Agreement" in the Original Agreement shall continue to refer to the date of the Original Agreement.

8. This Amendment No. 1 to Sales Agreement shall be governed by, and construed in accordance with, the internal laws of the State of New York without regard to the principles of conflicts of laws. Each party hereby irrevocably submits to the non-exclusive jurisdiction of the state and federal courts sitting in the City of New York, borough of Manhattan, for the adjudication of any dispute hereunder or in connection with any transaction contemplated hereby, and hereby irrevocably waives, and agrees not to assert in any suit, action or proceeding, any claim that it is not personally subject to the jurisdiction of any such court, that such suit, action or proceeding is brought in an inconvenient forum or that the venue of such suit, action or proceeding is improper. Each party hereby irrevocably waives personal service of process and consents to process being served in any such suit, action or proceeding by mailing a copy thereof (certified or registered mail, return receipt requested) to such party at the address in effect for notices to it under this Amendment No. 1 to Sales Agreement and agrees that such service shall constitute good and sufficient service of process and notice thereof. Nothing contained herein shall be deemed to limit in any way any right to serve process in any manner permitted by law.

9. The Company and Cowen each hereby irrevocably waives any right it may have to a trial by jury in respect of any claim based upon or arising out of this Amendment No. 1 to Sales Agreement or any transaction contemplated hereby.

10. This Amendment No. 1 to Sales Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument. Delivery of an executed amendment by one party to the other may be made by facsimile transmission or electronic transmission (e.g., PDF).

[Remainder of Page Intentionally Blank]

If the foregoing correctly sets forth the understanding between the Company and Cowen, please so indicate in the space provided below for that purpose, whereupon this letter shall constitute a binding amendment to the Original Agreement between the Company and Cowen.

Very truly yours,

COWEN AND COMPANY, LLC

By: /s/ Michael Murphy
Name: Michael Murphy
Title: Managing Director

ACCEPTED as of the date first-above written:

ADURO BIOTECH, INC.

By: /s/ Jennifer Lew
Name: Jennifer Lew
Title: Chief Financial Officer

Exhibit 21.1

Subsidiaries of Registrant

Name of Subsidiary	Jurisdiction of Incorporation
• Aduro GVAX, Inc.	Delaware
• Aduro International (Bermuda) Ltd.	Bermuda
• Aduro Netherlands Cooperatief UA	Netherlands
• Aduro Biotech Holdings Europe B.V.	Netherlands
• Aduro Biotech, Europe B.V.	Netherlands

Exhibit 23.1

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We consent to the incorporation by reference in Registration Statement Nos. 333-203508, 333-210016, 333-216373 and 333-223382 on Form S-8 and Registration Statement Nos. 333-211063, 333-219639, and 333-219640 on Form S-3 of our report dated February 27, 2019, relating to the consolidated financial statements of Aduro Biotech, Inc. and subsidiaries (the "Company") appearing in this Annual Report on Form 10-K of the Company for the year ended December 31, 2018.

/s/ Deloitte & Touche LLP
San Francisco, California
February 27, 2019

Exhibit 31.1

Certification of the Principal Executive Officer
Pursuant to
Securities Exchange Act Rules 13A-14(A) and 15D-14(A)

I, Stephen T. Isaacs, certify that:

1. I have reviewed this annual report on Form 10-K of Aduro Biotech, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13(a)-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. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: February 27, 2019

/s/ Stephen T. Isaacs
Stephen T. Isaacs
Chairman, President and Principal Executive Officer

Exhibit 31.2

Certification of Principal Financial Officer
Pursuant to
Securities Exchange Act Rules 13A-14(A) and 15D-14(A)

I, Jennifer Lew, certify that:

1. I have reviewed this annual report on Form 10-K of Aduro Biotech, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13(a)-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. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: February 27, 2019

/s/ Jennifer Lew
Jennifer Lew
Chief Financial Officer

Exhibit 32.1

Certification Pursuant to
18 U.S.C. Section 1350,
As Adopted Pursuant to
Section 906 of the Sarbanes-Oxley Act of 2002

In connection with the Annual Report of Aduro Biotech, Inc. (the "Company") on Form 10-K for the year ended December 31, 2018 (the "Report"), Stephen T. Isaacs, Chairman, President and Principal Executive Officer of the Company, and Jennifer Lew, Chief Financial Officer of the Company, each hereby certifies, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that:

1. The Report fully complies with the requirements of Section 13(a) or Section 15(d) of the Exchange Act; and

2. The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: February 27, 2019

/s/ Stephen T. Isaacs
Stephen T. Isaacs
Chairman, President and Principal Executive Officer

/s/ Jennifer Lew
Jennifer Lew
Chief Financial Officer

This certification accompanies the Form 10-K to which it relates, is not deemed filed with the Securities and Exchange Commission and is not to be incorporated by reference into any filing of Aduro Biotech, Inc. under the Securities Act of 1933, as amended, or the Securities Exchange Act of 1934, as amended (whether made before or after the date of the Form 10-K), irrespective of any general incorporation language contained in such filing.