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

# FORM 10-K

☒ **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 000-31161**

# ARENA PHARMACEUTICALS, INC.

**(Exact name of registrant as specified in its charter)**

| **Delaware** | **23-2908305** |
|---|---|
| **(State or other jurisdiction of incorporation or organization)** | **(I.R.S. Employer Identification No.)** |
| **6154 Nancy Ridge Drive, San Diego, CA** | **92121** |
| **(Address of principal executive offices)** | **(Zip Code)** |

**858.453.7200**
**(Registrant's telephone number, including area code)**

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

| **Title of each class** | **Name of each exchange on which registered** |
|---|---|
| Common Stock, par value $0.0001 per share | The Nasdaq Global Select Market |

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

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

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

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

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§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 of this chapter) 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, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company" and "emerging growth company" in Rule 12b-2 of the Exchange Act.

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

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

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

The aggregate market value of the voting and non-voting common equity held by non-affiliates of the registrant was approximately $1.9 billion as of June 29, 2018, based on the last sale price of the registrant's common stock as reported on the Nasdaq Global Select Market on such date. For purposes of this calculation, shares of the registrant's common stock held by directors and executive officers have been excluded. This number is provided only for purposes of this Annual Report on Form 10-K and does not represent an admission that any particular person or entity is an affiliate of the registrant.

As of February 22, 2019, there were 49,462,849 shares of the registrant's common stock outstanding.

**DOCUMENTS INCORPORATED BY REFERENCE**

Certain information required by Part III of this Annual Report on Form 10-K is incorporated by reference from the Registrant's Definitive Proxy Statement for the Annual Meeting of Stockholders to be held in June 2019, which will be filed with the Securities and Exchange Commission on or before April 30, 2019.

**ARENA PHARMACEUTICALS, INC.**

**FORM 10-K – ANNUAL REPORT**
**For the Fiscal Year Ended December 31, 2018**

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## INFORMATION RELATING TO FORWARD-LOOKING STATEMENTS

This Annual Report on Form 10-K, or Annual Report, includes forward-looking statements, which involve a number of risks and uncertainties. These forward-looking statements can generally be identified as such because the context of the statement will include words such as "may," "will," "intend," "plan," "believe," "anticipate," "expect," "estimate," "predict," "potential," "continue," "likely," or "opportunity," the negative of these words or other similar words. Similarly, statements that describe our future plans, strategies, intentions, expectations, objectives, goals or prospects and other statements that are not historical facts are also forward-looking statements. Discussions containing these forward-looking statements may be found, among other places, in "Business" and "Management's Discussion and Analysis of Financial Condition and Results of Operations" in this Annual Report. For such statements, we claim the protection of the Private Securities Litigation Reform Act of 1995. Readers of this Annual Report are cautioned not to place undue reliance on these forward-looking statements, which speak only as of the time this Annual Report was filed with the Securities and Exchange Commission, or SEC. These forward-looking statements are based largely on our expectations and projections about future events and future trends affecting our business and are subject to risks and uncertainties that could cause actual results to differ materially from those anticipated in the forward-looking statements. These risks and uncertainties include, without limitation, those discussed in "Business", "Risk Factors" and "Management's Discussion and Analysis of Financial Condition and Results of Operations" of this Annual Report. In addition, past financial or operating performance is not necessarily a reliable indicator of future performance, and you should not use our historical performance to anticipate results or future period trends. We can give no assurances that any of the events anticipated by the forward-looking statements will occur or, if any of them do, what impact they will have on our results of operations and financial condition. In addition, statements that "we believe" and similar statements reflect our beliefs and opinions on the relevant subject. These statements are based upon information available to us as of the date of this Annual Report, and while we believe such information forms a reasonable basis for such statements, such information may be limited or incomplete, and our statements should not be read to indicate that we have conducted an exhaustive inquiry into, or review of, all potentially available relevant information. These statements are inherently uncertain and you are cautioned not to unduly rely upon these statements. Except as required by law, we undertake no obligation to update publicly or revise our forward-looking statements to reflect events or circumstances that arise after the filing of this Annual Report or documents incorporated by reference herein that include forward-looking statements.

## TRADEMARKS AND CERTAIN TERMS

Arena Pharmaceuticals ® and Arena ® are registered service marks of Arena. Any other brand names or trademarks appearing in this Annual Report are the property of their respective holders.

In this Annual Report, "Arena Pharmaceuticals," "Arena," "we," "us" and "our" refer to Arena Pharmaceuticals, Inc., and our wholly owned subsidiaries on a consolidated basis, unless the context otherwise provides. "APD" is an abbreviation for Arena Pharmaceuticals Development.

## PART I

### Item 1. Business.

#### Overview

We are a biopharmaceutical company focused on delivering novel, transformational medicines with optimized pharmacology and pharmacokinetics to patients globally. Our proprietary, internally-developed pipeline includes multiple potentially first- or best-in-class assets with broad clinical utility.

Our most advanced investigational clinical programs are: etrasimod (APD334), which we are evaluating in late-stage clinical programs in ulcerative colitis, and Crohn's disease, as well as progressing programs for atopic dermatitis and other indications; olorinab (APD371) for a broad range of visceral pain conditions associated with inflammatory bowel diseases and irritable bowel syndrome, and which we are evaluating in a Phase 2 trial for treatment of gastrointestinal pain; and ralinepag (APD811), which we have licensed to United Therapeutics Corporation, or United Therapeutics, and is being evaluated by United Therapeutics in a Phase 3 program for pulmonary arterial hypertension. We continue to assess other earlier research and development stage drug candidates, including APD418, a potential first-in-class calcium-independent myofilament derepressor, which we are studying in a preclinical program for the treatment of decompensated heart failure.

We have license agreements or collaborations with various companies, including United Therapeutics (ralinepag), Everest Medicines Limited (etrasimod in Greater China and select countries in Asia), Boehringer Ingelheim International GmbH (undisclosed orphan GPCR program for central nervous system – preclinical), Outpost Medicine, LLC (undisclosed program with potential utility in treating genitourinary disorders – preclinical) and Eisai Co., Ltd. and Eisai Inc., collectively, Eisai (BELVIQ®/BELVIQ XR® – marketed products).

#### Our Strategy

The primary elements of our focus are to:

- Develop etrasimod – a modulator of the sphingosine 1-phosphate, or S1P, receptor intended for the treatment of a broad range of immune and inflammatory conditions including inflammatory bowel diseases and dermatologic diseases
- Develop olorinab – an agonist of the cannabinoid receptor type 2, or CB2, intended for the treatment of a range of visceral gastrointestinal pain
- Develop APD418 – a calcium-independent myofilament derepressor for the treatment of decompensated heart failure
- Develop our pipeline by efficiently managing our cash and development timelines, which may include entering strategic agreements for certain clinical and preclinical programs
- Progress additional pipeline programs over time in select therapeutic areas
- Build a streamlined, high-performing and high-energy organization

Arena Pharmaceuticals, Inc. was incorporated in the state of Delaware in April 1997, and is located in San Diego, California. Our operations are located in San Diego, California; Boston, Massachusetts; and Zug, Switzerland.

**Pipeline of Development Programs and Commercial Products**

Below is a summary of our internally developed, proprietary portfolio:

| Arena's Pipeline Products | | | |
|---|---|---|---|
| **Program** | **Indication** | **Status** | **Rights *** |
| **Etrasimod** | Ulcerative colitis | Phase 3 | Arena: worldwide, excluding rights granted to Everest Medicines for Greater China & certain other countries in Asia |
| | Crohn's disease | Phase 2b/3 | |
| | Atopic dermatitis | Phase 2 | |
| **Olorinab** | Inflammatory bowel disease | Phase 2 | Arena: worldwide |
| | Irritable bowel syndrome | Phase 2 | Arena: worldwide |
| **APD418** | Decompensated heart failure | Preclinical | Arena: worldwide |
| **Licenses and Collaborations** | **Program** | **Status** | **Rights *** |
| **United Therapeutics** | Ralinepag | Phase 3 | Worldwide |
| **Everest Medicines** | Etrasimod | Pharmacokinetic study/Phase 3 preparation | Greater China & certain other countries in Asia |
| **Eisai** | BELVIQ and BELVIQ XR | Marketed | Worldwide |
| **Boehringer Ingelheim** | Undisclosed orphan GPCR program for central nervous system | Preclinical | Worldwide |
| **Outpost Medicine** | Undisclosed compound for genitourinary disorders | Preclinical | Worldwide |

* Represents rights to all indications. In some cases, licensees and collaborators have sublicensed their rights in certain territories.

We also own and have rights to other clinical and preclinical stage compounds that were internally discovered by us.

**Etrasimod Program**

Etrasimod is a next-generation, oral, selective sphingosine 1 phosphate (S1P) receptor modulator, discovered by Arena, designed to provide systemic and local cell modulation by selectively targeting S1P receptor subtypes 1, 4 and 5. Etrasimod has therapeutic potential in immune and inflammatory-mediated diseases such as ulcerative colitis, Crohn's disease, and atopic dermatitis. S1P receptors have been demonstrated to be involved in the modulation of several biological responses, including lymphocyte trafficking from lymph nodes to the peripheral blood. By isolating subpopulations of lymphocytes in lymph nodes, fewer immune cells are available in the circulating blood to effect tissue damage.

*Inflammatory Bowel Diseases*

Inflammatory bowel diseases, or IBD, like ulcerative colitis, or UC, and Crohn's disease, or CD, are chronic inflammatory conditions of the gastrointestinal tract that affect approximately 3.1 million patients in the US alone. The prevalence of UC and CD in the US are currently estimated at 1.8 million and 1.3 million patients, respectively. The prevalence of IBD in European Union, or EU, is estimated at 3.0 million with 1.7 million patients with UC and 1.3 million patients with CD. Both conditions have a significant impact on the patient's quality of life and can in many cases be very aggressive and disabling.

UC is characterized by mucosal inflammation limited to the colon which involves the rectum in approximately 95% of cases and may extend to involve parts or all of the large intestine. In contrast, CD is characterized by full thickness inflammation that can occur anywhere in the gastrointestinal, or GI, tract but most typically involves the terminal ileum and colon; and causes fistulation and scarring. Symptoms for UC and CD can vary, depending on the location and severity of inflammation, but some of the most common are diarrhea, abdominal cramps, and rectal bleeding.

Important goals of therapy for IBD are to induce and maintain remission while improving the patient's quality of life. Currently available treatment options have limitations in terms of long-term efficacy and side effects, have complicated administration regimens, and often fail to induce or maintain remission. Therefore, we believe a significant unmet need remains for differentiated oral agents that are efficacious for induction and maintenance therapy with a favorable side effect profile. We believe that the oral once-daily dosing, selectivity, mechanism of action, and emerging clinical profile of etrasimod may represent a significant opportunity to provide patients with an effective treatment for IBD with an improved safety and dosing profile over current therapies.

*Atopic Dermatitis*

Atopic Dermatitis, or AD, is a chronic, inflammatory skin disorder characterized by dry skin, pruritus, and relapsing lesions. AD has a severe impact on quality of life, including potential occupational, social, and psychological impairments. The adult prevalence is approximately 18 million patients in the US and 22 million patients in the EU.

A survey published in 2016 showed that 86% of patients were not satisfied with current treatment options. Two new therapies have been marketed since 2016, however these treatments have less desirable administration routes and are not effective in all patients. Long-term efficacy of these therapies also remains relatively unknown. Therefore, we believe a significant unmet need remains for differentiated, safe, oral agents that are effective and have a favorable side effect profile.

AD pathology is driven by a combination of impaired skin epithelial barriers, altered microbiota, and aberrant inflammation driven by activated immune cells, including skin-infiltrating T cells and dendritic cells, or DCs. Etrasimod may have the potential to reduce DC migration/activation (S1P receptor subtypes 1 and 4 mediated) and T cell infiltration (S1P receptor subtype 1 mediated) in the skin. These effects could reduce the T cell-mediated inflammation in the skin that underlies atopic dermatitis pathogenesis.

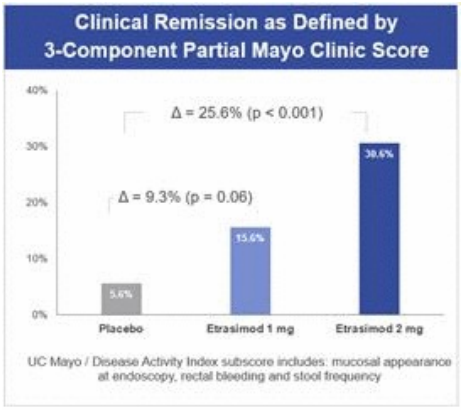
***Etrasimod Development***

*Inflammatory Bowel Disease*

We are currently preparing for a Phase 3 program in UC and a Phase 2b/3 program in CD.

In 2019, we announced positive results from a 34-week open-label extension, or OLE, of the Phase 2 OASIS trial of etrasimod for the treatment of ulcerative colitis. The trial enrolled 118 patients (84% of OASIS study completers), of which 22 completers also received 2 mg in OASIS, for a total of 46 weeks of treatment with etrasimod. Overall, etrasimod demonstrated durable, long-term clinical remission and was generally safe and well tolerated in this trial. Adverse events in the OLE study were generally mild to moderate in severity and no new safety findings were noted. Impact on heart rate and atrioventricular, or AV, conduction was minimal throughout the study with no discontinuations from study related to bradycardia or AV block.

In 2018, we announced topline results from OASIS, a dose finding 12-week randomized, double-blind, placebo-controlled multinational Phase 2 clinical trial of etrasimod in moderate to severe UC. The aim of the trial was to investigate a clear dose response and establish a clinically meaningful signal for the active arm(s) from placebo. The trial evaluated the effects of etrasimod at 1mg and 2mg versus placebo on multiple efficacy measures including a three-component partial Mayo Clinic Score, clinical remission, clinical response, and endoscopic improvement in 156 patients. Etrasimod demonstrated a clear dose response and statistically significant improvements versus placebo in the primary, all secondary, and clinical remission endpoints at the 2 mg dose. There were fewer patients with serious adverse events, or SAEs, compared to placebo (0% in 2 mg, 5.8% in 1 mg and 11.1% in placebo). Impact on heart rate and atrioventricular, or AV, conduction was low throughout the study with no discontinuations from study related to bradycardia or AV block. There were no increases in liver function tests compared to placebo and no reports of macular edema or pulmonary function test abnormalities. In this trial, etrasimod was well tolerated and safety results support a potential best-in-class profile.




Δ = % difference from placebo estimated using Mantel-Haenszel method adjusted with current oral corticosteroid use and prior exposure to TNFa antagonists.

*Atopic Dermatitis*

We are currently preparing for a Phase 2 program in atopic dermatitis.

In 2018, we evaluated data from relevant patients with dermatological conditions in etrasimod trials. We believe the data we have, although limited, support ongoing investigation of etrasimod in skin disorders.

***Prior Development***

Starting in 2017, we initiated exploratory Phase 2, proof-of-concept, open-label studies to evaluate the efficacy and safety of etrasimod in patients with pyoderma gangrenosum, primary biliary cholangitis and active dermatologic extraintestinal manifestations of IBD. We decided to conclude these studies based on our strategic focus on IBD and atopic dermatitis.

In January 2015, we announced top-line results from a Phase 1b multiple-ascending dose clinical trial for etrasimod. In the trial, etrasimod demonstrated a dose-dependent effect on lymphocyte count lowering in blood, with mean decreases from baseline of up to 69%. Lymphocyte counts, on average, recovered to baseline within one week of conclusion of dosing. There was a modest impact on heart rate, but none of the changes were classified by the investigator as clinically significant. There were also no findings with respect to pulmonary function or liver enzyme tests that were classified by the investigator as clinically significant. The most common treatment-emergent adverse events were mild or moderate contact dermatitis, headache, constipation and diarrhea, with none being clearly drug related. There were no discontinuations for adverse events, and no serious adverse events were observed.

The randomized, double-blind, placebo-controlled Phase 1b clinical trial evaluated the safety, tolerability, pharmacodynamics and pharmacokinetics of multiple-ascending doses of etrasimod. In five different dosing cohorts, 50 healthy volunteers received etrasimod and 10 healthy volunteers received placebo for 21 days.

Prior to commencing the Phase 1b multiple-ascending dose clinical trial for etrasimod, we completed a Phase 1 single-ascending dose clinical trial of the compound. This randomized, double-blind and placebo-controlled trial evaluated the safety, tolerability and pharmacokinetics of single-ascending doses of etrasimod in 40 healthy adult volunteers. In the trial, etrasimod demonstrated favorable pharmacokinetic and pharmacodynamic effects, a dose-responsive reduction in blood lymphocyte count and a slowing of heart rate that appears comparable to other S1P receptor modulators. The terminal half-life was approximately 35 hours.

***Etrasimod Intellectual Property***

As of February 15, 2019, we owned issued patents that cover compositions of matter for etrasimod and related compounds, methods of treatment utilizing etrasimod and related compounds, and various salts of etrasimod and crystalline forms thereof in 61 jurisdictions, including the United States, China, Japan, Germany, France, Italy, the United Kingdom, Spain, Canada, India, Russia, South Korea and Australia, and had an application pending in one other jurisdiction (Brazil). Patents on etrasimod issued by the US Patent and Trademark Office include serial numbers US 8,580,841, US 9,126,932, and US 9,522,133 while the corresponding patent granted by the European Patent Office has serial number EP 2326621 B2. We also own issued patents and/or pending applications directed to solid-state forms of etrasimod, dosage regimens for etrasimod, synthetic routes and intermediates useful in the manufacturing of etrasimod, and other methods of treatment utilizing etrasimod. The earliest priority date for the patents on etrasimod is 2008. The terms of these patents are capable of continuing into 2029 in most jurisdictions without taking into account any patent term adjustment or extension regimes of any country or any additional term of exclusivity we might obtain by virtue of the later filed patent applications.

**Olorinab Program**

Olorinab, a potentially first-in-class, orally available, potent, peripherally restricted, highly selective, full agonist of the CB2 receptor, is an internally discovered investigational drug candidate we are exploring for the treatment of visceral pain, specifically pain associated with the gastrointestinal system, such as IBD and irritable bowel syndrome, or IBS.

Visceral pain is defined as pain that originates within muscle, pleura, connective tissue, nervous system or solid organs within the abdomen or peritoneum. It is distinct from somatic or neuropathic pain, and is perceived as stretching, pulling and distention, rather than by cutting, crushing, or burning more commonly associated with neuropathic pain. Visceral pain is one of the most common types of pain. For example, abdominal pain affects approximately 20% of the general population. Visceral pain may be caused by a diverse set of organic causes, such as inflammation (e.g., IBD, including CD and UC, pancreatitis, prostatitis, and vaginitis), obstruction (e.g., bowel obstruction, and nephrolithiasis), ischemia, and malignancy, among others. Visceral pain may also be caused by functional disorders such as interstitial cystitis, dyspepsia, IBS, and vulvodynia.

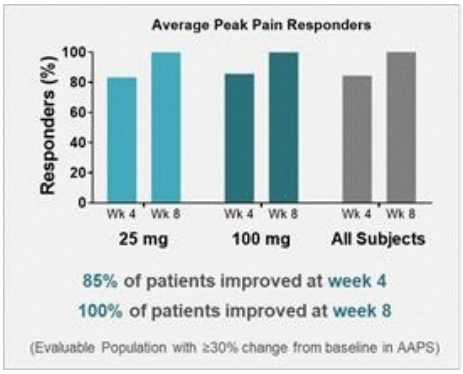
There are approximately 3.1 million patients in the US with IBD, with 90% experiencing abdominal pain or cramps. There are approximately 24 million patients in the US with IBS, with 78% reporting frequently recurring or continuous abdominal pain. Common treatments for visceral pain range from non-invasive, conservative approaches (e.g., physical therapy or acupuncture), to pharmacologic (e.g., tricyclic antidepressants acting as neurotransmitter reuptake inhibitors), and invasive interventions (e.g., bowel resection). Potent analgesics, such as opioids, can adversely affect GI function. Other commonly prescribed analgesics are often not potent enough and may lead to other GI side effects such as bleeding. Except for linaclotide and lubiprostone, prescribed for IBS, no visceral-specific analgesics are currently available. Approximately one in eight CD patients is chronically treated with opioids.

The CB2 receptor is expressed in the GI nervous system, and in many tissues and organs of the abdomen. CB2 receptors are found peripherally on immune cells but also on microglia, terminal neurons, dorsal root ganglia, and on visceral sensory neurons. We believe selectively targeting the CB2 receptor may provide therapeutic benefit for visceral pain without the potential for dependence, abuse, and GI and cardiovascular side effects associated with opiates or nonsteroidal anti-inflammatory drugs, or NSAIDs, which are among the most common pain relievers. In addition to analgesic effects, olorinab may have anti-inflammatory properties.

Olorinab is designed to be a peripherally restricted and selective CB2 receptor agonist and is intended to provide pain relief without the unwanted side effects associated with CB1 receptor activation.

***Olorinab Development***

In 2018, we announced positive topline results from our Phase 2a trial of olorinab in development for the treatment of pain associated with CD. This exploratory study was an open-label investigation to evaluate safety and tolerability of olorinab in this patient population and to gain initial insights into its efficacy via a pain visual analog scale, or VAS. Fourteen patients were enrolled into two cohorts at 25 mg and 100 mg administered three times daily for up to eight weeks. Reductions in pain were seen within the first week of treatment and statistically significant improvement from baseline in Average Abdominal Pain Score, or AAPS, at weeks four and eight. In this trial, olorinab appeared safe and generally well tolerated with no clinically significant changes in heart rate or blood pressure, no psychotropic effects, and no discontinuations due to adverse events.



In April 2016, we announced favorable results from a Phase 1b multiple-ascending dose clinical trial of olorinab. This randomized, double-blind, placebo-controlled Phase 1b clinical trial enrolled 36 healthy adults to evaluate the safety, tolerability and pharmacokinetics of multiple-ascending doses of olorinab. Cohorts of 12 subjects (9 active, 3 placebo) were administered doses of 50 mg, 100 mg, or 200 mg of olorinab or placebo three times daily for 10 days and, in connection with the pharmacokinetic evaluation, one time on the 11th day. The most common adverse events were headache and nausea. All adverse events were classified as mild, and there were no serious adverse events reported. There was one discontinuation in the high-dose group due to an adverse event of mild thirst and somnolence. Reductions in blood pressure and heart rate were observed, but none were symptomatic or resulted in an adverse event. Drug levels at all doses tested in the trial, including the lowest dose, were well above those believed to be needed to stimulate the CB2 receptor.

In April 2015, we announced favorable top-line results from a Phase 1 single-ascending dose clinical trial of olorinab. The randomized, double-blind and placebo-controlled trial enrolled 56 healthy adults to evaluate the safety, tolerability and pharmacokinetics of single-ascending doses of olorinab. Dose-responsive exposure was observed over the explored dose range of 10-400 mg with good tolerability at all doses administered.

***Olorinab Intellectual Property***

As of February 15, 2019, we owned issued patents covering compositions of matter for olorinab and related compounds, and methods of treatment utilizing olorinab and related compounds, in 21 jurisdictions, including the United States, China, Japan, Canada, Russia, South Korea and Australia, and we had applications pending in 10 other jurisdictions, of which the ones with the largest pharmaceutical markets were Europe, Venezuela, Brazil and India. Patents on olorinab issued by the US Patent and Trademark Office include serial numbers US 8,778,950 and US 9,944,606. We also own issued patents and/or pending applications directed to various solid-state forms of olorinab, and other methods of treatment utilizing olorinab. The earliest priority date for the patents on olorinab is 2009. The terms of these patents are capable of continuing into 2030 in most jurisdictions without taking into account any patent term adjustment or extension regimes of any country or any additional term of exclusivity we might obtain by virtue of the later filed patent applications.

**APD418 Program**

APD418 is a potential first-in-class calcium-independent myofilament derepressor, or CMD, in development for the treatment of decompensated heart failure, or DHF.

DHF is a clinical syndrome of new or worsening signs and symptoms of chronic heart failure, often leading to hospitalization or a visit to the emergency department. DHF is an area of high unmet medical need affecting a heterogeneous population with high post-discharge readmission rates and significant morbidity and mortality. Projections of decompensated heart failure forecast 9.5 million hospitalizations annually by 2025 in major markets worldwide. Approximately 70% of patients are readmitted within one year of the first treatment and patients experience a 20% increased mortality with each rehospitalization. The current in-hospital standard of care for DHF aims to improve hemodynamic status with drugs that increase cardiac contractility (inotropes) via modulation of the myocardial beta-adrenergic receptor, or AdrR, pathway. However, treatment with currently approved inotropes targeting beta1/beta2 adrenergic pathways has been associated with adverse effects on blood pressure and heart rate and result in increased long-term mortality.

APD418 is a beta3 AdrR antagonist, with no action on beta1/beta2 AdrRs. Beta3 AdrR upregulation and activation in DHF has been shown to decrease cardiac contractility, thus inhibition of beta3 with APD418 potentially represents a novel mechanism to improve contractility without the adverse hemodynamic and chronotropic changes associated with current inotropes that put stress on the heart. We are currently preparing an investigational new drug, or IND, application enabling package.

**Additional Internal Preclinical and Clinical Programs**

We have additional clinical and preclinical assets, including temanogrel and APD597, which we are evaluating for future development. We are also evaluating additional delivery forms of the products in our pipeline to extend clinical utility or improve the product profile.

**Collaborations and License Agreements**

In addition to our primary focus on developing our proprietary, unencumbered clinical pipeline, we have strategic collaborations and licenses with pharmaceutical companies, including United Therapeutics, Everest Medicines Limited, or Everest, Boehringer Ingelheim International GmbH, or Boehringer Ingelheim, Outpost Medicine, LLC, or Outpost Medicine, Beacon Discovery, Inc., or Beacon, and Eisai.

***United Therapeutics License Agreement***

In November 2018, we entered into a collaboration and license agreement with United Therapeutics. Under the United Therapeutics Agreement, we granted United Therapeutics an exclusive, worldwide, royalty-bearing license to develop, manufacture and commercialize ralinepag. This transaction was completed on January 24, 2019. At the closing of the transaction, we transferred to United Therapeutics certain other assets relating to ralinepag, including, among others, related domain names and trademarks, permits, certain contracts, inventory, regulatory documentation, IND, and non-clinical, pre-clinical and clinical trial data. United Therapeutics has agreed to assume certain limited liabilities, including, among others, all post-closing obligations under assumed contracts and the IND. United Therapeutics is responsible for all development, manufacture and commercialization of the licensed products globally.

Upon the closing of this transaction, in January 2019, we received an upfront payment of $800.0 million. We are eligible to receive a payment of $150.0 million upon first marketing approval of ralinepag in a major non-US market, and a payment of $250.0 million upon US marketing approval of an inhaled formulation of ralinepag. In addition, we are entitled to receive low double-digit, tiered royalties on net sales of ralinepag products, subject to certain adjustments for third party license payments.

The United Therapeutics Agreement contains various representations and warranties of Arena and United Therapeutics, and various covenants of the parties, including covenants to cooperate in seeking regulatory approvals, as well as our agreement not to compete, during the period in which royalties are payable (or during the five-year period following the closing if we are subject to a change of control transaction) in the development of a prostacyclin to treat pulmonary arterial hypertension, or PAH.

*Ralinepag Program*

Ralinepag is a next-generation potent, highly selective oral IP receptor agonist intended for the treatment of PAH. Ralinepag was designed by us to deliver intravenous prostacyclin-like potency and pharmacokinetics in an oral tablet. In non-clinical experiments, ralinepag demonstrated potentially best-in-class activation of the IP receptor resulting in vasodilation, inhibition of smooth muscle cell proliferation and inhibition of platelet aggregation. Additionally, early stage studies of ralinepag pharmacokinetics in humans revealed an approximately 24-hour half-life and a low peak-to-trough ratio supporting therapeutic blood levels with once daily dosing.

Ralinepag was granted orphan drug status for the treatment of PAH by the US Food and Drug Administration, or FDA, in September 2014, and by the European Medicines Agency in January 2019.

PAH is a progressive, life-threatening disorder characterized by increased pressure in the pulmonary arteries that carry blood from the heart to the lungs. PAH occurs when the pulmonary arteries thicken or grow rigid. This makes blood flow more difficult. The heart must work harder to push blood through the arteries, and the arteries are unable to carry adequate blood to the lungs. The increased pressure strains the heart, which can limit physical activity, result in heart failure and reduce life expectancy. PAH will continue to worsen over time, even with proper treatment. Based on data from the Registry to EValuate Early And Long-term PAH disease management, or REVEAL, of patients in the US, there is an estimated five-year survival rate of 57% from diagnosis.

PAH involves several interrelated mechanisms, with prostacyclin and thromboxane A2 playing a major role in maintaining pulmonary vascular tone through their balanced activity. Prostacyclin, released by endothelial cells, promotes vasodilation and inhibits platelet aggregation. Prostacyclin also has antiproliferative effects on vascular smooth muscle. Despite treatment guidelines, targeting the prostacyclin pathway has been primarily reserved for patients with advanced disease due to limitations of currently available options including parenteral prostacyclins which are the only PAH treatment that have demonstrated a mortality benefit.

*Ralinepag Development*

In 2018, we announced positive data from a planned interim analysis of the ongoing open-label extension of the Phase 2 trial of ralinepag in development for the treatment of pulmonary arterial hypertension.

In 2017, we announced topline results from a 22-week, randomized, double-blind, placebo-controlled Phase 2 trial evaluating the effectiveness in reducing pulmonary vascular resistance, or PVR, improving exercise capacity, tolerability and safety of ralinepag. In this trial, 40 patients with PAH received ralinepag and 21 received placebo. Topline results showed statistically significant improvement of both absolute and percentage change from baseline in PVR. Ralinepag also demonstrated numerical improvement in six-minute walk distance, or 6MWD, but as the study was not powered to show a difference in 6MWD from placebo, this was a not a statistically-significant finding. The safety and tolerability profiles were in line with other oral prostacyclins.

In 2013, we announced topline results from a multiple-dose, randomized, double-blind and placebo-controlled Phase 1 clinical trial evaluating multiple-ascending doses of ralinepag in healthy volunteers. In this trial, 40 healthy volunteers received ralinepag and 15 received placebo. The safety profile of ralinepag in this trial was characteristic of IP receptor agonists: the most frequent treatment-emergent adverse events were headache, nausea and jaw pain. One serious adverse event, transient atrial fibrillation, occurred in a single subject, and the study investigator considered it to be possibly treatment related. Further review revealed that the subject had multiple characteristics predisposing the patient to atrial fibrillation, including cardiac abnormalities prior to study start.

In 2011, we announced topline results of a Phase 1 clinical trial to evaluate the safety, tolerability and pharmacokinetics of single-ascending doses of ralinepag. The randomized, double-blind and placebo-controlled trial evaluated 32 healthy volunteers in four cohorts of eight participants each, with six randomized to ralinepag and two to placebo. Ralinepag was rapidly absorbed and demonstrated dose-proportional pharmacokinetic exposure over the tested dose range. Consistent with the expected pharmacology of ralinepag, the most common adverse events were headache, vomiting, nausea, jaw pain and flushing.

***Everest Collaboration***

In December 2017, we entered into a Collaboration and License Agreement, or the Everest Agreement, with Everest regarding the development and commercialization of ralinepag and etrasimod in China, Taiwan, Hong Kong, Macau and South Korea, or the Everest Territories. In January 2019, we and Everest amended the Everest Agreement by entering into two separate agreements, one for each of ralinepag and etrasimod, with the terms for each program that are substantially the same as in the original Everest Agreement. Under the United Therapeutics Agreement, we assigned the separate Everest Agreement related to ralinepag to United Therapeutics.

Under the separate Everest Agreement related to etrasimod, we granted Everest an exclusive, royalty-bearing license to develop, manufacture and commercialize etrasimod (in oral formulations only), in the Everest Territories.

Everest is responsible for all development, manufacture and commercialization of the licensed products in the Everest Territories, and may participate in the portion of our global clinical trials that is conducted in the Everest Territories.

In addition to an upfront payment of $12.0 million, we are eligible to receive development, regulatory and commercial milestone payments from Everest of up to $115.0 million, as well as tiered royalties on net sales ranging from the high single digits to low double digits. Following an initial royalty term, we are eligible to receive a lower trademark royalty if Everest continues to use our licensed product-related trademarks.

In the fourth quarter of 2018, the National Medical Products Administration of China, formerly known as the China Food and Drug Administration, or CFDA, accepted the initial clinical trial applications for an oral formulation of ralinepag and for etrasimod.

***Boehringer Ingelheim Collaboration***

In 2015, we entered into an exclusive agreement with Boehringer Ingelheim, to conduct joint research to identify drug candidates targeting a GPCR that belongs to a group of orphan central nervous system, or CNS, receptors. An “orphan receptor” is structurally related to a family of proteins that are known to act as functional cell-surface receptors but whose ligand has not yet been identified. In December 2018, Boehringer Ingelheim opted to start the preclinical development of the subject compound.

We contracted with Beacon to perform our research obligations under the Boehringer Ingelheim collaboration. In exchange, we agreed to share limited near-term milestones with Beacon as well as the full-time equivalent funding paid to us by Boehringer Ingelheim. We have retained the longer-term success milestones and all royalties.

***Outpost Medicine License Agreement***

In 2017, we entered into a research study and option to license agreement with Outpost Medicine, LLC, or Outpost Medicine. In 2018, Outpost Medicine exercised its option to enter into a licensing agreement with us to advance an undisclosed, preclinical compound with potential utility in treating genitourinary disorders. We received an upfront fee comprised of cash and equity totaling $3.0 million and are eligible to receive $96.5 million in development and commercial milestone payments and up to low double-digit tiered royalties on annual net sales of the compound.

***Beacon Discovery Agreements***

In September 2016, we entered into a series of agreements with Beacon. Beacon was founded and is owned by several of our former employees.

We entered into a License and Collaboration Agreement with Beacon, pursuant to which we granted Beacon a non-exclusive, non-assignable and non-sublicensable license to certain database information relating to compounds, receptors and pharmacology, and transferred certain equipment to Beacon. Beacon will seek to engage global partners to facilitate discovery and development. Beacon has agreed to assign to us any intellectual property relating to our existing research and development programs developed in the course of performing research for us, and grant us a non-exclusive license to any intellectual property developed outside the course of performing work for us that is reasonably necessary or useful for developing or commercializing the products under our research and development programs. We are also entitled to rights of negotiation and rights of first refusal to potentially obtain licenses to certain compounds discovered and developed by Beacon. In addition, we are entitled to receive (i) a percentage of any revenue received by Beacon on or after the second anniversary of the effective date of the agreement from any third party pursuant to a third-party license, including upfront payments, milestone payments and royalties; (ii) single-digit royalties on the aggregate net sales of any related products sold by Beacon and its affiliates; and (iii) in the event that Beacon is sold, a percentage of the consideration for such sale transaction.

We also entered a Master Services Agreement with Beacon, pursuant to which Beacon performs certain research services for us relating to our proprietary pipeline, as well as a services agreement to support our research obligations under our collaboration with Boehringer Ingelheim.

***BELVIQ (lorcaserin) Agreement***

Lorcaserin is approved for marketing in the United States, South Korea, Brazil, Mexico, Israel, and Taiwan for the indication of weight management, and is being commercialized by Eisai or its distributors in the United States, South Korea, Israel, and Taiwan. BELVIQ was made available by prescription in the United States in June 2013 and in South Korea in February 2015. Eisai also has launched of a once-daily formulation of lorcaserin in the United States, which is marketed under the brand name BELVIQ XR. Lorcaserin has not yet been launched in Brazil or Mexico. In December 2016, we entered into a Transaction Agreement and a Supply Agreement with Eisai, which replaced our prior marketing and supply agreement with Eisai for lorcaserin. In 2018, Eisai reported positive top line results from CAMELLIA-TIMI61, a long-term cardiovascular outcome trial of lorcaserin.

*Transaction Agreement*

Pursuant to the Transaction Agreement, we granted Eisai an exclusive, royalty-bearing license, or transferred intellectual property, to develop, manufacture and commercialize lorcaserin in all countries and territories of the world. In consideration for the rights granted to Eisai under the Transaction Agreement, Eisai has agreed to make tiered royalty payments to us on the net sales of lorcaserin. The royalty rates range from 9.5% on annual global net sales less than or equal to $175.0 million, 13.5% on annual global net sales greater than $175.0 million but less than or equal to $500.0 million and 18.5% on annual global net sales greater than $500.0 million.

We are eligible to receive a milestone payment of $25.0 million upon the achievement of global net sales of lorcaserin for a calendar year first exceeding $250.0 million.

Eisai is solely responsible for all costs and expenses in connection with the development of lorcaserin. Eisai has the exclusive right and responsibility to plan and implement all research and development of lorcaserin at its own cost and expense, including conducting all regulatory activities and all clinical and development activities.

Eisai is solely responsible, and has the exclusive rights, for commercializing lorcaserin and is responsible for manufacturing lorcaserin. Eisai is responsible for using commercially reasonable efforts to commercialize lorcaserin products in the United States, as well as to develop, seek regulatory approval and commercialize lorcaserin products in the European Union, China and Japan.

We and Eisai will each bear 50% of losses arising from any alleged defective manufacturing of lorcaserin that was manufactured in the past by us, and Eisai will be solely responsible for any expenses and losses associated with other product liability claims.

***Siegfried Transaction***

On March 9, 2018, we entered into an Asset Purchase Agreement, or Sale Agreement, with Siegfried Pharma AG and Siegfried AG, collectively and individually, Siegfried. Under the Sale Agreement, we agreed to sell and assign to Siegfried, and Siegfried agreed to purchase and assume from our subsidiary Arena Pharmaceuticals GmbH, or Arena GmbH, certain drug product finishing facility assets and know-how, including fixtures, equipment, other personal property and real estate assets located in Zofingen, Switzerland and related contracts and certain related liabilities, or collectively, the Manufacturing Operations. We refer to this transaction as the Siegfried Transaction. The Siegfried Transaction was completed on March 31, 2018. In connection with the Siegfried Transaction, all of Arena GmbH's approximately 50 employees transferred to Siegfried.

**Intellectual Property**

Our success depends in large part on our ability to protect our compounds and information, and to operate without infringing the proprietary rights of third parties. We rely on a combination of patent, trade secret, copyright, and trademark laws, as well as confidentiality, licensing and other agreements, to establish and protect our proprietary rights. We seek patent protection for our key inventions, including drug candidates we identify, routes for chemical synthesis, pharmaceutical formulations and methods of treatment.

There is no assurance that any of our patent applications will issue, or that any of the patents will be enforceable or will cover a drug or other commercially significant product or method. In addition, we regularly review our patent portfolio to identify patents and patent applications for potential abandonment that we deem to have relatively low value to our ongoing business operations. There is also no assurance that we will correctly identify which of our patents and patent applications should be maintained and which should be abandoned. The term of most of our other current patents commenced, and most of our future patents, if any, will commence, on the date of issuance and terminate 20 years from the earliest effective filing date of the patent application. Because any marketing and regulatory approval for a drug often occurs several years after the related patent application is filed, the resulting market exclusivity afforded by any patent on our drug candidates will likely be substantially less than 20 years.

In the United States, patent term adjustment is available for certain delays in patent office proceedings. In addition, under the Drug Price Competition and Patent Term Restoration Act of 1984, or the Hatch-Waxman Act, the term of a patent that covers an FDA-approved drug may be eligible for patent term extension, or PTE. PTE permits patent term restoration of a US patent as compensation for the patent term lost during product development and the FDA regulatory review process. The Hatch-Waxman Act permits a PTE of up to five years beyond the expiration of the patent. This period is generally one-half the time between the effective date of an Investigational New Drug, or IND (falling after issuance of the patent), and the submission date of an NDA, plus the time between the submission date of an NDA and the approval of that application, provided the sponsor acted with diligence. A PTE 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 may be extended. The application for PTE is subject to approval by the PTO in conjunction with the FDA.

Outside of the United States, similar provisions may be available in the European Union, Japan, South Korea and some other jurisdictions to extend the term of a patent that covers an approved drug. The length of any such extension would vary by country. Our European patents may be eligible for supplemental protection certificates of up to five years in one or more countries.

Due to the specific requirements for obtaining these extensions, there is no assurance that our patents will be afforded extensions even if we encounter significant delays in patent office proceedings or marketing and regulatory approval.

In addition to patent protection, we rely on trade secrets, proprietary know-how and continuing technological advances to develop and maintain our competitive position. To maintain the confidentiality of our trade secrets and proprietary information, all of our employees are required to enter into and adhere to an employee confidentiality and invention assignment agreement, and invention disclosure procedures as a condition of employment. Additionally, our employee confidentiality and invention assignment agreements require that our employees not bring to us, or use without proper authorization, any third-party proprietary technology. We also generally require our consultants and collaborators that have access to proprietary property and information to execute confidentiality and invention rights agreements in our favor before beginning their relationship with us. While such arrangements are intended to enable us to better control the use and disclosure of our proprietary property and provide for our ownership of proprietary technology developed on our behalf, they may not provide us with meaningful protection for such property and technology in the event of unauthorized use or disclosure.

**Competition**

The biotechnology and pharmaceutical industries are highly competitive and are subject to rapid and significant change. We face significant competition from many organizations with drugs or drug candidates that do or may compete drug candidates we are developing. We may not be able to compete successfully against these organizations, which include many large, well-financed and experienced pharmaceutical and biotechnology companies, as well as academic and research institutions and government agencies. Developments by others may render our drug candidates obsolete or noncompetitive, and we or our collaborators may not be successful in developing either first or best in class drugs.

Many of our existing and potential competitors have substantially greater drug development capabilities and financial, scientific and marketing resources than we do. Additional consolidation in the pharmaceutical industry may result in even more resources being concentrated with our competitors. As a result, our competitors may be able to devote greater resources than we can to the research, development, marketing and promotion of therapeutic products or drug discovery techniques, or to adapt more readily to technological advances than we can. Accordingly, our competitors may succeed in obtaining patent protection, receiving regulatory approval or commercializing drugs before we do.

We expect to encounter significant competition in the therapeutic areas targeted by our principal drug candidates. Companies that complete clinical trials, obtain regulatory approvals and commence commercial sales of their drug candidates before us may achieve a significant competitive advantage. Furthermore, we may be competing against companies with substantially greater manufacturing, marketing, distribution and selling capabilities, and any drug candidate that we successfully develop may compete with existing therapies that have longer histories of safe and effective use.

We may rely on collaborators for support of development programs and for the manufacturing and marketing of drug candidates. Such collaborators may be conducting multiple drug development efforts within the same disease areas that are the subject of their agreements with us, which may negatively impact the development of drugs that are subject to our agreements. In addition, we face and will continue to face intense competition from other companies for such collaboration arrangements, and technological and other developments by others may make it more difficult for us to establish such relationships.

**Government Regulation**

We and our collaborators are subject to significant governmental regulation. The FDA and comparable regulatory agencies in state and local jurisdictions and in foreign countries impose substantial requirements upon the preclinical and clinical development, pre-market approval, manufacture, import, export, marketing and distribution of pharmaceutical products. These agencies and other regulatory agencies regulate research and development activities and the testing, approval, manufacture, quality control, safety, effectiveness, labeling, storage, tracking, recordkeeping, advertising, pricing and promotion of drug candidates and commercialized drugs. Failure to comply with applicable FDA or other regulatory requirements may result in inspectional notices of violation, warning letters, civil or criminal penalties, suspension or delays in clinical development, recall or seizure of products, partial or total suspension of production, withdrawal of a product from the market or other negative consequences.

***In the United States***

In the United States, the FDA regulates drug products under the Federal Food, Drug, and Cosmetic Act, or FD&C Act, and its implementing regulations. The process required by the FDA before drug candidates may be marketed in the United States generally involves the following:

- completion of extensive preclinical laboratory tests and preclinical animal studies, many of which are required to be performed in accordance with the FDA's Good Laboratory Practice, or GLP, regulations;
- submission to the FDA of an IND, which must become effective before human clinical trials may begin and be updated annually;
- performance of adequate and well-controlled human clinical trials to establish the safety and efficacy of the drug candidate for each proposed indication;
- submission to the FDA of a New Drug Application, or NDA, after completion of adequate and well-controlled human clinical trials, generally accompanied by payment of a substantial user fee to the FDA;
- a determination by the FDA within 60 days of its receipt of the NDA to file the NDA for review;
- satisfactory completion of an FDA pre-approval inspection of the manufacturing facilities at which the active pharmaceutical ingredient and finished drug product are produced and tested to assess compliance with Current Good Manufacturing Practices, or cGMP, regulations;

- FDA review and approval of the NDA prior to any commercial marketing or sale of the drug in the United States; and
- Prior to commercialization, centrally acting drugs may be subject to review and potential scheduling by the DEA.

The development and approval process requires substantial expertise, time, effort and financial resources, and we cannot be certain that any approvals for our drug candidates will be granted on a timely basis, if at all.

The results of preclinical tests (which include laboratory evaluation as well as GLP studies to evaluate toxicity in animals) for a particular drug candidate, together with related manufacturing information and analytical data, are submitted as part of an IND to the FDA. The initial IND becomes effective 30 days after receipt by the FDA, following its initial safety review. During the 30-day time period the FDA may require additional information. The FDA may institute a clinical hold at the 30-day time period if any questions are not fully addressed or because of other concerns about the conduct of the clinical trial, including concerns that human research subjects will be exposed to unreasonable health risks. In such a case, the IND sponsor and the FDA must resolve any outstanding concerns before the clinical trial can begin. The FDA may place an IND on partial or full clinical hold at any time during a product candidate's development. A separate submission to an existing IND must also be made for each successive clinical trial conducted during product development. Further, an independent institutional review board, or IRB, for each medical center proposing to conduct the clinical trial must review and approve the plan for any clinical trial before it commences at that center and it must monitor the study until completed. The FDA, the IRB or the sponsor may suspend a clinical trial at any time on various grounds, including a finding that the subjects or patients are being exposed to an unacceptable health risk. Clinical testing also must satisfy extensive Good Clinical Practice, or GCP, regulations and regulations for informed consent and privacy of individually identifiable information.

**Clinical trials.** For purposes of NDA submission and approval, clinical trials are typically conducted in the following sequential phases, which may overlap:

- Phase 1 clinical trials. Studies are initially conducted in a limited population to test the drug candidate for safety, dose tolerance, absorption, metabolism, distribution and excretion, typically in healthy volunteers, but in some cases in patients.
- Phase 2 clinical trials. Studies are generally conducted in a limited patient population to identify possible adverse effects and safety risks, explore the initial efficacy of the product for specific targeted indications and to determine dose range or pharmacodynamics. Multiple Phase 2 clinical trials may be conducted by the sponsor to obtain information prior to beginning larger and more expensive Phase 3 clinical trials.
- Phase 3 clinical trials. These are commonly referred to as pivotal studies or adequate and well-controlled studies. When Phase 2 evaluations demonstrate that a dose range of the product is effective and has an acceptable safety profile, Phase 3 clinical trials are undertaken in large patient populations to further evaluate dosage, provide substantial evidence of clinical efficacy and further test for safety in an expanded and diverse patient population at multiple, geographically dispersed clinical trial centers.
- Phase 4 clinical trials. The FDA may approve an NDA for a drug candidate but require that the sponsor conduct additional clinical trials to further assess the drug after NDA approval under a post-approval commitment. In addition, a sponsor may decide to conduct additional clinical trials after the FDA has approved an NDA. Post-approval trials are typically referred to as Phase 4 clinical trials.

**New drug applications.** The results of drug development, preclinical studies and clinical trials are submitted to the FDA as part of an NDA. NDAs also must contain extensive chemistry, manufacturing and control, or CMC, information. An NDA is usually accompanied by a significant user fee. The FDA reviews all NDAs submitted to ensure that they are sufficiently complete for substantive review before it accepts them for filing, which occurs, if at all, 60 days after submission by the NDA sponsor. Once the submission has been accepted for filing, the FDA's goal is to review applications within 10 months from its acceptance of the filing or, if the application relates to an unmet medical need in a serious or life-threatening indication, six months from its acceptance of the filing. The review process can be significantly extended by FDA requests for additional information or clarification. The FDA may refer the application to an advisory committee for review, evaluation and recommendation as to whether the application should be approved. The FDA is not bound by the recommendation of an advisory committee. The FDA may deny approval of an NDA by issuing a Complete Response Letter, or CRL, if the applicable regulatory criteria are not satisfied. A CRL may require additional clinical data and/or an additional pivotal Phase 3 clinical trial(s), and/or other significant, expensive and time-consuming requirements related to clinical trials, preclinical studies or manufacturing. Data are not always conclusive, and the FDA may interpret data differently than we or our collaborators interpret data. Approval may occur with Risk Evaluation and Mitigation Strategies, or REMS, that may limit the labeling, distribution or promotion of a drug product. Once issued, the FDA may withdraw product approval if ongoing regulatory requirements are not met or if safety problems occur after the product reaches the market. In addition, the FDA may require testing, including Phase 4 clinical trials, and surveillance programs to monitor the safety effects of approved products which have been commercialized, and the FDA has the power to prevent or limit further marketing of a product based on the results of these postmarketing programs or other information.

**Other US regulatory requirements**. Products manufactured or distributed pursuant to FDA approvals are subject to continuing regulation by the FDA, including recordkeeping, annual product quality review and reporting requirements. Adverse event experience with the product must be reported to the FDA in a timely fashion and pharmacovigilance programs to proactively look for these adverse events are mandated by the FDA. Drug manufacturers and their subcontractors are required to register their establishments with the FDA and certain state agencies and are subject to periodic inspections (which may be unannounced) by the FDA and certain state agencies for compliance with ongoing regulatory requirements, including cGMP regulations, which impose certain procedural and documentation requirements upon us and our third-party manufacturers. Following such inspections, the FDA may issue notices on Form FDA 483 and warning letters that could cause us to modify certain activities. A Form FDA 483 notice, if issued at the conclusion of an FDA inspection or after the appropriate FDA office review of the Establishment Inspection Report prepared by the investigator, can list conditions the FDA believes may have violated cGMP or other FDA regulations. FDA guidelines specify that a warning letter be issued for violations of "regulatory significance," also known as Official Action Indicated, or OAI. Failure to adequately and promptly correct the observation(s) can result in regulatory action. In addition to Form FDA 483 notices and warning letters, failure to comply with the statutory and regulatory requirements can subject a manufacturer to possible legal or regulatory action, such as suspension of manufacturing, recall of product, seizure of product, injunctive action or possible civil or criminal penalties.

The FDA closely regulates the post-approval marketing and promotion of drugs, including standards and regulations for healthcare professional marketing activities and materials, direct-to-consumer advertising, dissemination of off-label information, industry-sponsored scientific and educational activities and promotional activities involving the Internet. Drugs may be marketed only for their approved indications and in accordance with the provisions of the confines of the pivotal studies and the approved label. Further, we may be required to develop additional data or conduct additional preclinical studies and clinical trials, and we may be required to submit and obtain FDA approval of a new or supplemental NDA for changes to, among other things, the indications, labeling, or manufacturing processes or facilities of a drug. Failure to comply with these requirements can subject a manufacturer to possible legal or regulatory action, such as warning letters, corrective advertising, suspension of manufacturing, seizure of product, injunctive action or potential civil and criminal penalties.

Physicians may prescribe legally available drugs for uses that are not described in the product's labeling and that differ from those tested by us and approved by the FDA, if in their professional medical judgment, the physicians deem such use to be appropriate. Such off-label uses are common across certain medical specialties. The FDA does not regulate the behavior of physicians in their choice of treatments. The FDA does, however, impose stringent restrictions on manufacturers' communications regarding off-label use.

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

**Drug Enforcement Administration regulation**. The DEA regulates drugs that are controlled substances. Controlled substances are those drugs that appear on one of the five schedules promulgated and administered by the DEA under the Controlled Substances Act, or CSA. The CSA governs, among other things, the inventory, distribution, recordkeeping, handling, security and disposal of controlled substances. Any drug that acts on the central nervous system has the potential to become a controlled substance based on an evaluation of its abuse potential, and scheduling by the DEA is a separate process that may delay the commercial launch of a drug even after FDA approval of the NDA. Companies with a scheduled drug are subject to periodic and ongoing inspections by the DEA and similar state drug enforcement authorities to assess ongoing compliance with the DEA's regulations. Any failure to comply with these regulations could lead to a variety of sanctions, including the revocation or a denial of renewal of any DEA registration, injunctions, or civil or criminal penalties.

**Hatch-Waxman Exclusivity**. Market exclusivity provisions of the Hatch-Waxman Act can delay the submission or approval of applications seeking to rely upon the FDA's findings of safety and effectiveness for a previously approved NDA. A new chemical entity, or NCE, subject to an NDA is entitled to a five-year period of non-patent marketing exclusivity in the United States. A drug is an NCE if the FDA has not previously approved any other new drug containing the same active moiety, which is the molecule or ion responsible for the action of the drug substance. During the exclusivity period, the FDA may not accept for review an abbreviated new drug application, or ANDA, or a 505(b)(2) NDA submitted by another company for another version of such drug where the applicant does not own or have a legal right of reference to all the data required for approval. However, such an application may be submitted after four years if it contains a certification of patent invalidity or non-infringement of patents listed with the FDA by the NDA holder. The Hatch-Waxman Act also provides three years of marketing exclusivity for an NDA, or supplement to an existing NDA, if new clinical investigations, other than bioavailability studies, that were conducted or sponsored by the applicant are deemed by the FDA to be essential to the approval of the application. This three-year exclusivity covers only the conditions of use associated with the new clinical investigations and does not prohibit the FDA from approving ANDAs for drugs containing the original active ingredient. Five-

year and three-year exclusivity will not delay the submission or approval of a full NDA. However, an applicant submitting a full NDA would be required to conduct or obtain a right of reference to all of the preclinical studies and adequate and well-controlled clinical trials necessary to demonstrate safety and effectiveness.

**Orphan drug designation and exclusivity**. Under the Orphan Drug Act, the FDA may designate a drug product as an "orphan drug" if it is intended to treat a rare disease or condition (generally meaning that it affects fewer than 200,000 individuals in the United States, or more in cases in which there is no reasonable expectation that the cost of developing and making a drug product available in the United States for treatment of the disease or condition will be recovered from sales of the product). A company must request orphan product designation before submitting an NDA. If the request is granted, the FDA will disclose the identity of the therapeutic agent and its potential use. Orphan product designation does not convey any advantage in or shorten the duration of the regulatory review and approval process.

If a product with orphan status receives the first FDA approval for the disease or condition for which it has such designation or for a select indication or use within the rare disease or condition for which it was designated, the product generally will receive orphan product exclusivity. Orphan product exclusivity means that the FDA may not approve any other applications for the same product for the same indication for seven years, except in certain limited circumstances. Competitors may receive approval of different products for the indication for which the orphan product has exclusivity and may obtain approval for the same product but for a different indication or the same product for the same indication if demonstrated to be clinically superior. If a drug or drug product designated as an orphan product ultimately receives marketing approval for an indication broader than what was designated in its orphan product application, it may not be entitled to exclusivity.

***Outside of the United States***

Outside of the United States, the ability to market a product is contingent upon obtaining marketing authorization from the appropriate regulatory authorities. The requirements governing marketing authorization, pricing and reimbursement vary widely from country to country. Whether or not we obtain FDA approval for a product candidate, we must obtain the requisite approvals from regulatory authorities in foreign jurisdictions prior to the commencement of clinical studies or marketing and sale of the product in those countries. Approval in the United States does not guarantee approval in other countries and vice-versa.

**Prescription drug reimbursement**. In the United States and markets in other countries, sales of prescription drug products depend in part on the availability of reimbursement from third-party payers. Third-party payers include government health administrative authorities, managed care organizations, private health insurers and other organizations. The process for determining whether a payer will provide coverage for a drug product may be separate from the process for setting the price or reimbursement rate that the payer will pay for the drug product. Third-party payers may limit coverage to specific drug products on an approved list, or formulary, which might not include all of the FDA-approved drug products for a particular indication. Third-party payers are increasingly challenging the price and examining the medical necessity and cost-effectiveness of medical products and services, in addition to their safety and efficacy. We may need to conduct expensive pharmacoeconomic studies to demonstrate the cost-effectiveness of our products. A payer's decision to provide coverage for a drug product does not imply that an adequate reimbursement rate will be approved. 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. Patients who are prescribed medications for the treatment of their conditions, and their prescribing physicians, generally rely on third-party payers to reimburse all or part of the costs associated with their prescription drugs. Patients are less likely to use our products unless coverage is provided and reimbursement is adequate to cover a significant portion of the cost of our products. Therefore, coverage and adequate reimbursement are important to new product acceptance.

If a drug is reimbursed by Medicare or Medicaid, pricing and rebate programs must comply with, as applicable, the Medicare Prescription Drug, Improvement, and Modernization Act of 2003 as well as the Medicaid rebate requirements of the Omnibus Budget Reconciliation Act of 1990 and the Veterans Health Care Act of 1992, or VHCA, each as amended. If products are made available to authorized users of the Federal Supply Schedule of the General Services Administration, additional laws and requirements apply. Under the VHCA, drug companies are required to offer certain drugs at a reduced price to a number of federal agencies including US Department of Veterans Affairs and US Department of Defense, the Public Health Service and certain private Public Health Service designated entities in order to participate in other federal funding programs including Medicare and Medicaid. Participation under the VHCA requires submission of pricing data and calculation of discounts and rebates pursuant to complex statutory formulas, as well as entry into government procurement contracts governed by the Federal Acquisition Regulations.

The containment of healthcare costs has become a priority of federal, state and foreign governments, and the prices of drugs have been a focus in this effort, which has resulted in several recent congressional inquiries and proposed and enacted federal and state legislation designed to, among other things, bring more transparency to product pricing, review the relationship between pricing and manufacturer patient programs, and reform government program reimbursement methodologies for products. In addition, emphasis on managed care in the United States has increased and we expect will continue to increase the pressure on drug pricing. Coverage

policies, third-party reimbursement rates and drug pricing regulation may change at any time. In particular, the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act of 2010, or collectively the ACA, was enacted in the United States in March 2010 and contains provisions that may reduce the profitability of drug products, including, for example, increased rebates for drugs sold to Medicaid programs, extension of Medicaid rebates to Medicaid managed care plans, mandatory discounts for certain Medicare Part D beneficiaries and annual fees based on pharmaceutical companies' share of sales to federal healthcare programs. There have been judicial and Congressional challenges to certain aspects of the ACA. For example, since January 2017, President Trump has signed two Executive Orders and other directives designed to delay the implementation of certain provisions of the ACA or otherwise circumvent some of the requirements for health insurance mandated by the ACA. Concurrently, Congress has considered legislation that would repeal or repeal and replace all or part of the ACA. While Congress has not passed comprehensive repeal legislation, two bills affecting the implementation of certain taxes under the ACA have been signed into law. The Tax Cuts and Jobs Act of 2017, or TCJA, includes a provision repealing, effective January 1, 2019, the tax-based shared responsibility payment imposed by the ACA on certain individuals who fail to maintain qualifying health coverage for all or part of a year that is commonly referred to as the "individual mandate". Additionally, on January 22, 2018, President Trump signed a continuing resolution on appropriations for fiscal year 2018 that delayed the implementation of certain ACA-mandated fees, including the so-called "Cadillac" tax on certain high cost employer-sponsored insurance plans, the annual fee imposed on certain health insurance providers based on market share, and the medical device excise tax on non-exempt medical devices. Further, the Bipartisan Budget Act of 2018, or the BBA, among other things, amended the ACA, effective January 1, 2019, to increase from 50 percent to 70 percent the point-of-sale discount that is owed by pharmaceutical manufacturers who participate in Medicare Part D and to close the coverage gap in most Medicare drug plans, commonly referred to as the "donut hole". In July 2018, the United States Department of Health and Human Services' Centers for Medicare & Medicaid Services, or CMS, published a final rule permitting further collections and payments to and from certain ACA qualified health plans and health insurance issuers under the ACA risk adjustment program in response to the outcome of federal district court litigation regarding the method CMS uses to determine this risk adjustment. On December 14, 2018, a Texas U.S. District Court Judge ruled that the ACA is unconstitutional in its entirety because the "individual mandate" was repealed by Congress as part of the TCJA. While the Texas U.S. District Court Judge, as well as the Trump administration and CMS, have stated that the ruling will have no immediate effect pending appeal of the decision, it is unclear how this decision, subsequent appeals, and other efforts to repeal and replace the ACA will impact the ACA and our business. Even if favorable coverage and reimbursement status is attained for our products, less favorable coverage policies and reimbursement rates may be implemented in the future. In the case of BELVIQ, Medicare explicitly excludes coverage of drugs for weight loss.

In countries outside the United States, pricing of pharmaceutical products may be subject to governmental control. Evaluation criteria used by many government agencies for the purposes of pricing and reimbursement typically focus on a product's degree of innovation and its ability to meet a clinical need unfulfilled by currently available therapies. Some countries 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 drug candidate to currently available therapies. Other countries allow companies to fix their own prices for medicines but monitor and control company profits. In addition, in some countries, cross-border imports from low-priced markets exert a commercial pressure on pricing within a country. There can be no assurance that any country that has price controls or reimbursement limitations for drug products will allow favorable reimbursement and pricing arrangements for any of our products.

**Healthcare fraud and abuse**. Pharmaceutical companies are subject to various federal and state laws pertaining to healthcare fraud and abuse, including, but not limited to, anti-kickback and false claims laws.

The Federal Anti-Kickback Statute makes it illegal for any person or entity, including a prescription drug manufacturer, or a party acting on its behalf, to knowingly and willfully solicit, offer, receive or provide any remuneration, directly or indirectly, in exchange for, or to induce, the referral of business, including the purchase, order, lease of any good, facility, service or item, including the prescription of a particular drug, for which payment may be made under federal healthcare programs such as Medicare and Medicaid. Some of the state prohibitions are broader in scope and apply to referral of patients for healthcare services reimbursed by any source, not only the Medicare and Medicaid programs.

In the course of practicing medicine, physicians may legally prescribe FDA-approved drugs for an indication that has not been approved by the FDA and which, therefore, is not described in the product's approved labeling, so-called "off-label use" or "the practice of medicine," if deemed appropriate in the physicians' professional medical judgment. The FDA does not ordinarily regulate the behavior of physicians in their choice of treatments. The FDA and other government agencies do, however, restrict communications on the subject of off-label use by a manufacturer or those acting on behalf of a manufacturer. Companies may not promote FDA-approved drugs for off-label uses. The FDA and other governmental agencies do permit a manufacturer (and those acting on its behalf) to engage in some limited, non-misleading, non-promotional exchanges of scientific information regarding unapproved indications.

There are numerous federal false claims laws and civil monetary penalty laws that forbid, among other things, anyone from knowingly presenting, or causing to be presented for payment to third-party payers (including Medicare and Medicaid) claims for

reimbursed drugs or services that are false or fraudulent, claims for items or services not provided as claimed or claims for medically unnecessary items or services.

Violations of fraud and abuse laws may be punishable by criminal, civil and/or administrative sanctions, including individual imprisonment, disgorgement, criminal fines and civil monetary penalties, possible exclusion from federal healthcare programs (including Medicare and Medicaid), and integrity oversight and reporting obligations to resolve allegations of non-compliance with these laws. In addition, under certain healthcare fraud and abuse laws, there is an ability for private individuals to bring similar actions. Additionally, many states have analogous fraud and abuse laws, some of which may be broader in scope. Further, there are an increasing number of state laws that require pharmaceutical 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, or register their sales representatives, as well as prohibiting certain other sales and marketing practices. The federal transparency requirements under the ACA require certain manufacturers of drugs, devices, biologics and medical supplies to annually report to the Department of Health and Human Services information related to payments and other transfers of value to physicians and teaching hospitals and physician ownership and investment interests. Additionally, recent federal legislation imposes additional obligations on certain pharmaceutical manufacturers, among others, regarding drug product tracking and tracing.

Our activities are also potentially subject to federal and state consumer protection and unfair competition laws. We are also subject to the US Foreign Corrupt Practices Act, or the FCPA, which prohibits companies and individuals from engaging in specified activities to obtain or retain business or to influence a person working in an official capacity. Under the FCPA, it is illegal to pay, offer to pay, or authorize the payment of anything of value to any foreign government official, governmental staff members, political party or political candidate in an attempt to obtain or retain business or to otherwise influence a person working in an official capacity.

**Healthcare privacy and security laws**. The Health Insurance Portability and Accountability Act of 1996, or HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act and its implementing regulations, imposes obligations, including mandatory contractual terms, with respect to safeguarding the privacy, security and transmission of individually identifiable health information. In addition, many state laws apply to the use and disclosure of health information. We may be subject to, or our collaborators' marketing activities may be limited by, HIPAA and its implementing regulations. In addition, the European Union has established its own data security and privacy legal framework, including but not limited to Directive 95/46/EC, or the Data Protection Directive. The Data Protection Directive will be replaced starting in May 2018 with the recently adopted European General Data Protection Regulation, or GDPR, which contains new provisions specifically directed at the processing of health information, higher sanctions and extra-territoriality measures intended to bring non-EU companies under the regulation. We may in the future expand our business operations to include additional operations in the EU, including potentially conducting preclinical and clinical trials. With such expansion, we would be subject to increased governmental regulation, including the GDPR, in the EU countries in which operate.

Additionally, California recently enacted legislation that has been dubbed the first "GDPR-like" law in the United States. Known as the California Consumer Privacy Act, or CCPA, it creates new individual privacy rights for consumers (as that word is broadly defined in the law) and places increased privacy and security obligations on entities handling personal data of consumers or households. When it goes into effect on January 1, 2020, the CCPA will require covered companies to provide new disclosures to California consumers, provide such consumers new ways to opt-out of certain sales of personal information, and allow for a new cause of action for data breaches. Legislators have stated that amendments will be proposed to the CCPA before it goes into effect, but it remains unclear what, if any, modifications will be made to this legislation or how it will be interpreted. As currently written, the CCPA will likely impact (possibly significantly) our business activities and exemplifies the vulnerability of our business to the evolving regulatory environment related to personal data and protected health information.

**Manufacturing, Revenues from External Customers, and Sources and Availability of Materials**

Our revenues of $18.0 million for the year ended December 31, 2018, included $6.6 million from Eisai, $4.4 million from Boehringer Ingelheim, $2.8 million from Outpost Medicine, $2.2 million from Axovant, and $2.0 million from Everest. Our revenues of $21.3 million for the year ended December 31, 2017, included $12.0 million from Everest, $5.1 million from Boehringer Ingelheim and $1.7 million from Eisai. Our revenues of $92.2 million for the year ended December 31, 2016, included $78.4 million from Eisai, $5.1 million from Boehringer Ingelheim and $4.2 million from Ildong. This information excludes revenue activity reported within discontinued operations. See Note 5 and Note 8 to our consolidated financial statements included in this Annual Report for additional information. We do not currently engage in manufacturing activities and we are not dependent on availability of materials for our core business operations.

**Compliance with Environmental Regulations**

Our business involves the controlled use of hazardous materials, chemicals, biological materials and various radioactive compounds. In the United States, we are subject to regulation under the Occupational Safety and Health Act, the Environmental Protection Act, the US Environmental Protection Agency, the California Environmental Protection Agency, the Toxic Substances Control Act, the Resource Conservation and Recovery Act, the CSA and other federal, state or local regulations.

We may be subject to further such regulations in the future. Although we believe that our operations comply in all material respects with the applicable environmental laws and regulations, the risk of accidental contamination or injury from these materials cannot be eliminated. In the event of such an accident, we could be held liable for any damages that result, and the extent of that liability could exceed our resources. Our compliance with these laws and regulations has not had, and is not expected to have, a material effect upon our capital expenditures, results of operations or competitive position.

**Employees**

As of February 15, 2019, we had a total of 194 employees, including 138 in research and development and 56 in administration, which includes finance, legal, facilities, information technology and other general support areas.

**Available Information**

Our annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K and all amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934, or the Exchange Act, are available free of charge on our website (*www.arenapharm.com*) as soon as reasonably practicable after they are electronically filed with, or furnished to, the SEC.

## Item 1A. Risk Factors.

*Investment in our stock involves a high degree of risk. You should consider carefully the risks described below, together with other information in this Annual Report on Form 10-K and other public filings, before making investment decisions regarding our stock. If any of the following events actually occur, our business, operating results, prospects or financial condition could be materially and adversely affected. This could cause the trading price of our common stock to decline and you may lose all or part of your investment. Moreover, the risks described below are not the only ones that we face. Additional risks not presently known to us or that we currently deem immaterial may also affect our business, operating results, prospects or financial condition.*

### *Risks Relating to Our Business*

**Drug development programs are expensive, time consuming, uncertain and susceptible to change, interruption, delay or termination.**

Drug development programs are very expensive, time consuming and difficult to design and implement. Our drug candidates are in various stages of clinical and preclinical development and are prone to the risks of failure inherent in research and development. Clinical trials and preclinical studies are needed to demonstrate that drug candidates are safe and effective to the satisfaction of the FDA, and similar non-US regulatory authorities, and the FDA or other regulatory authority may require us to, or we or others may decide to, conduct additional research and development even after a drug is approved. The commencement or completion of our clinical trials or preclinical studies could be substantially delayed or prevented by several factors, including the following:

- limited number of, and competition for, suitable patients required for enrollment in our clinical trials or animals to conduct our preclinical studies;
- limited number of, and competition for, suitable sites to conduct our clinical trials or preclinical studies;
- delay or failure to obtain a meeting, approval or agreement from the applicable regulatory authority to commence a clinical trial or approval of a study protocol;
- delay or failure to obtain sufficient supplies of drug candidates, drugs or other materials for the trial or study;
- delay or failure to reach agreement on acceptable agreement terms or protocols; and
- delay or failure to obtain institutional review board, or IRB, approval to conduct a clinical trial at a prospective site.

For example, recruitment for the indications in our ongoing and planned clinical studies is competitive and challenging, and it is difficult to predict when such trials will be fully enrolled or when data will be available.

In addition, the FDA, other regulatory authorities, collaborators, or we may suspend, delay or terminate our development programs at any time for various reasons, including those listed above affecting the commencement or completion of trials and the following:

- side effects experienced by study participants or other safety issues;
- lack of effectiveness of any drug candidate during clinical trials;
- slower than expected rates of patient recruitment and enrollment or lower than expected patient retention rates;
- inadequacy of or changes in our manufacturing process or compound formulation;
- delays in obtaining regulatory approvals to commence a study, or "clinical holds," or delays requiring suspension or termination of a study by a regulatory authority, such as the FDA, after a study is commenced;
- changes in applicable regulatory policies and regulations;
- delays in identifying and reaching agreement on acceptable terms with prospective clinical trial sites;
- uncertainty regarding proper dosing;
- unfavorable results from ongoing clinical trials or preclinical studies;
- failure of our clinical research organizations to comply with all regulatory and contractual requirements or otherwise perform their services in a timely or acceptable manner;
- scheduling conflicts with participating clinicians and clinical institutions;
- failure to design appropriate clinical trial protocols;
- insufficient data to support regulatory approval;
- termination of clinical trials at one or more clinical trial sites;
- inability or unwillingness of medical investigators to follow our clinical protocols;
- difficulty in maintaining contact with subjects during or after treatment, which may result in incomplete data;
- lack of sufficient funding to continue clinical trials or preclinical studies; or
- changes in business priorities or perceptions of the value of the program.

There is typically a high rate of attrition from the failure of drug candidates proceeding through clinical trials, and many companies have experienced significant setbacks in advanced development programs even after promising results in earlier studies or trials. We have experienced setbacks in our internal and partnered development programs and expect to experience additional setbacks from time to time in the future. In addition, even if the earlier-stage results of our development programs are favorable, these programs may take significantly longer than expected to complete or may not be completed at all. If we or our collaborators abandon or are delayed in our development efforts related to any drug or drug candidate, we may not be able to generate sufficient revenues to continue our operations at the current or planned level or be profitable, our reputation in the industry and in the investment community would likely be significantly damaged, additional funding may not be available to us or may not be available on terms we or others believe are favorable, and our stock price may decrease significantly.

We may not be successful in initiating, enrolling patients in, or completing our studies or trials or advancing our programs on our projected timetable, if at all. Any failure to initiate or delays in our studies, trials or development programs, or unfavorable results or decisions or negative perceptions regarding any of our programs, could cause our stock price to decline significantly. This is particularly the case with respect to our clinical programs.

**We will need to obtain additional funds or enter into collaboration agreements to execute on our corporate strategy, and we may not be able to do so at all or on terms you view as favorable; your ownership may be substantially diluted if we do obtain additional funds; you may not agree with the manner in which we allocate our available resources; and we may not be profitable.**

It takes many years and potentially hundreds of millions of dollars to successfully develop a compound into a marketed drug. We have accumulated a large deficit that has primarily resulted from the significant expenditures we have made in research and development since our inception. We expect that our losses and operating expenses will continue to be substantial.

All of our internal programs are in the development stage, and we may not have adequate funds to develop all of our compounds into marketed drugs.

We may seek to obtain additional funding through the capital markets or other financing sources. Additional funding may not be available to us or may not be available on terms we or others believe are favorable. Our ability to obtain additional funding may depend on many factors, including those outside our control. Should we obtain additional funding, your ownership interest may be diluted or otherwise negatively impacted.

We may enter into collaboration or other agreements with other entities to continue to develop and, if successful, commercialize one or more of our drug candidates. We may not be able to enter into any such agreements on terms that we or third parties, including investors or analysts, view as favorable, if at all. Our ability to enter into any such agreement for any of our programs or drug candidates depends on many factors, potentially including the outcomes of additional testing (including clinical trial results) or regulatory applications for marketing approval, and we do not control these outcomes.

We may allocate our resources in ways that do not improve our results of operations or enhance the value of our assets, and our stockholders and others may also not agree with the manner in which we choose to allocate our resources or obtain additional funding. We may also eliminate, scale back or delay some or all of our research and development programs, and any such reductions or failure to apply our resources effectively or to obtain additional funding could narrow, slow or otherwise adversely impact the development and commercialization of one or more of our drug candidates, which could reduce our opportunities for success and have a material adverse effect on our business, our prospects and the market price of our common stock.

In addition, we cannot assure you that we will be profitable or, if we are profitable for any particular time period, that we will be profitable in the future.

**Our business may be negatively impacted based on the clinical trials and preclinical studies of, and decisions affecting, one or more of our drug candidates.**

The results and timing of clinical trials and preclinical studies, as well as related decisions by us, collaborators and regulators, can affect our stock price. Results of clinical trials and preclinical studies are uncertain and subject to different interpretations by regulatory agencies, us or others. The design of these trials and studies (which may change significantly and be more expensive than anticipated depending on results and regulatory decisions), as well as related analyses of such results, including adverse effects, may not be viewed favorably by us or third parties, including investors, analysts, current or potential collaborators, the academic and medical communities, and regulators, which could adversely impact the development and opportunities for regulatory approval of drug candidates and commercialization (and even result in withdrawal from the market) of approved drugs. The same may be true of decisions regarding the focus and prioritization of our research and development efforts. Stock prices of companies in our industry have declined significantly when such results and decisions were unfavorable or perceived negatively or when a drug candidate or product did not otherwise meet expectations.

**The development, approval or commercialization of any of our drug candidates could be negatively affected by circumstances related to other drug candidates or approved products.**

Information on our drug candidates in clinical development is preliminary and incomplete, and for such drug candidates, particularly in the earlier stages of development, information on approved products in the same or related drug classes may indicate potential risks related to the development of our drug candidates. For example, etrasimod is an orally available modulator of the S1P receptors. An approved drug that is also an orally available modulator of the S1P receptors, Gilenya, is associated with risks such as adverse cardiovascular effects, including lowering of the heart rate and heart blocks, infection, macular edema, respiratory effects, fetal risk, a rare brain infection, and elevations in liver enzymes. These adverse reactions and risks may be associated with S1P receptor modulation and could be found to be associated with the use of etrasimod. Such adverse reactions and risks, either actual or perceived, could negatively impact its development, approval or commercialization, or our ability to enter into a collaboration on acceptable terms.

**Topline data may not accurately reflect the complete results of a particular study or trial.**

We may publicly disclose topline or interim data from time to time, which are based on a preliminary analysis of then-available efficacy and safety data, and the results and related findings and conclusions are subject to change following a more comprehensive review of the data related to the particular study or trial.

We also make assumptions, estimations, calculations and conclusions as part of our analyses of data, and others, including regulatory agencies, may not accept or agree with our assumptions, estimations, calculations, conclusions or analyses or may interpret or weigh the importance of data differently, which could impact the value of the particular program, the approvability or commercialization of the particular drug candidate or drug and our company in general. In addition, the information we may publicly disclose regarding a particular study or clinical trial is based on what is typically extensive information, and you or others may not agree with what we determine is the material or otherwise appropriate information to include in our disclosure, and any information we determine not to disclose may ultimately be deemed significant with respect to future decisions, conclusions, views, activities or otherwise regarding a particular drug, drug candidate or our business.

**Our hypothesis that selectively targeting receptors can lead to more efficacious or safer drugs may not be correct.**

In general, we have designed and optimized the drug candidates that we or our collaborators and licensees are developing (including etrasimod, ralinepag and olorinab) to selectively target certain receptors found on cells in humans. Our hypothesis is that selectivity may allow our drug candidates to address diseases more efficaciously or without some of the negative effects associated with less selective drugs. In certain cases, we believe early research and, if available, early clinical testing, provides preliminary support for our hypothesis. However, our hypothesis may not be correct, early research and early phase clinical testing may not be predictive of efficacy or safety in later trials, and our drug candidates may not be approved or, if approved, have the desired efficacy or safety profile.

It is generally our strategy to develop drug candidates that we believe will be first-in-class, best-in-class, or similar descriptions, or otherwise have broad clinical utility, optimized pharmacology or optimized pharmacokinetics. Some or all of our drug candidates may not achieve these goals. For example, failure to complete enrollment in clinical trials on schedule or at all could prevent a drug candidate from being first-in-class. Similarly, comparing data from different trials, or making predictions based on preclinical data, may not allow us to correctly determine whether our drug candidates are superior to competitive drugs or drug candidates in the same way that comparisons can be made from conducting trials in which our and a competitive drug is tested "head to head" in the same trial. The failure of our drugs or drug candidates to be first-in-class, best-in-class, or similar descriptions, or have broad clinical utility, optimized pharmacology, or optimized pharmacokinetics, could adversely affect development, regulatory approval, third-party payor support, or market adoption, which would have a material adverse impact on our business.

**The results of preclinical studies and completed clinical trials are not necessarily predictive of future results, and our current drug candidates or any approved drugs may not be further developed or have favorable results in later studies or trials.**

Preclinical studies and Phase 1 and Phase 2 clinical trials are not primarily designed to test the efficacy of a drug candidate, but rather to test safety, to study pharmacokinetics and pharmacodynamics, and to understand the drug candidate's side effects at various doses and schedules. Favorable results in early studies or trials may not be confirmed in later studies or trials, including preclinical studies that continue or that are initiated after earlier clinical trials and large-scale clinical trials, and our drug candidates or drugs in subsequent trials or studies may fail to show desired safety and efficacy despite having progressed through earlier-stage trials. For example, we have announced positive topline Phase 2 results for etrasimod in patients with ulcerative colitis, but these results may not be confirmed in any subsequent Phase 3 study. By way of another example, the impact of etrasimod on heart rate that was observed in completed clinical trials may not be observed in subsequent trials, and it could be viewed negatively by the FDA or other regulatory agencies.

Unfavorable results from clinical trials or preclinical studies could result in delays, modifications or abandonment of ongoing or future clinical trials, or abandonment of a program. Clinical and preclinical results are frequently susceptible to varying interpretations that may delay, limit or prevent regulatory approvals or commercialization. Negative or inconclusive results or adverse medical events during such trials or studies could cause a clinical trial to be delayed, repeated or terminated; a program to be abandoned; or negatively impact a related marketed drug, which could have a material adverse effect on our business, financial condition and results of operations.

**Drug discovery and development is intensely competitive in the therapeutic areas on which we focus. If the number of our competitors increase or they develop treatments that are approved faster, marketed better, less expensive or demonstrated to be more effective or safer than our drugs or drug candidates, our commercial opportunities will be reduced or eliminated.**

Many of the drugs we or our collaborators are attempting or may attempt to discover and develop may compete with existing therapies in the United States and other territories. In addition, many companies are pursuing the development of new drugs that target the same diseases and conditions that we target. For example, with regard to etrasimod, there are other drugs that have a similar mechanism of action that entered Phase 3 clinical development before etrasimod for the same indications that we are pursuing, such as ulcerative colitis.

Our competitors, particularly large pharmaceutical companies, may have substantially greater research, development and marketing and sales capabilities and greater financial, scientific and human resources than we do. Companies that complete clinical trials, obtain required regulatory agency approvals and commence commercial sale of their drugs before we do for the same indication may achieve a significant competitive advantage, including certain patent and marketing exclusivity rights. In addition, our competitors' drugs may have fewer side effects, more desirable characteristics (such as efficacy, route of administration or frequency of dosing), or be viewed more favorably by patients, healthcare providers, healthcare payers, the medical community, the media or others than our drug candidates or drugs, if any, for the same indication. Our competitors may also market generic or other drugs that compete with our drugs at a lower price than our drugs, which may negatively impact our drug sales, if any. Any results from our research and development efforts, or from our joint efforts with our existing or any future collaborators, may not compete successfully with existing or newly discovered products or therapies.

**Our revenues in the future will be substantially dependent on the success of our or our collaborators' and licensees' marketing of drugs we have discovered or developed. To the extent such drugs are not commercially successful, our business, financial condition and results of operations may be materially adversely affected, and the price of our common stock may decline.**

We believe our revenues will be substantially dependent on the success of the drugs we or our collaborators and licensees successfully develop. We do not know whether or when such drug candidates will be approved by regulatory authorities for sale or commercialized. Even if approved and commercialization begins, we do not know if such commercialization will be successful or otherwise meet our, your, analysts' or others' expectations, and the market price of our common stock could decline significantly. For example, sales of lorcaserin to date have been less than we and others initially anticipated. Lorcaserin is the only approved and marketed drug in which we have a financial interest. Our future revenue for the near-term is substantially dependent on our license and partnership agreements.

We cannot guarantee future product sales or achievement of milestones under our collaborations and license agreements. For example, our license agreement with United Therapeutics for ralinepag does not contain a covenant obligating United Therapeutics to use any particular efforts to develop or commercialize any product, and we may never receive any milestone or royalty payments under this license agreement. In addition, our Transaction Agreement with Eisai for lorcaserin, and our other collaborations, may be terminated early in certain circumstances, which may result in us not receiving additional milestone or other payments under the terminated agreement.

The degree of market acceptance and commercial success of a drug will depend on a number of factors, including the following, as well as risks identified in other risk factors:

- the number of patients treated with the drug and their results;
- market acceptance and use of the drug, which may depend on the public's view of the drug, economic changes, national and world events, potentially seasonal and other fluctuations in demand, the timing and impact of current or new competition, and the drug's perceived advantages or disadvantages over alternative treatments (including relative convenience, ease of administration, and prevalence and severity of any adverse events, including any unexpected adverse events);
- the actual and perceived safety and efficacy of the drug on both a short- and long-term basis among actual or potential patients, healthcare providers and others in the medical community, regulatory agencies and insurers and other payers, including related decisions by any such entity or individual;
- incidence and severity of any side effects, including as a result of off-label use or in combination with one or more drugs;
- new data relating to the drug, including as a result of additional studies, trials or analyses of the drug or related drugs or drug candidates;
- the willingness of physicians to prescribe and of patients to use the drug;
- the claims, limitations, warnings and other information in the drug's current or future labeling;
- any current or future scheduling designation for the drug by the US Drug Enforcement Administration, or DEA, or any comparable foreign authorities;
- our or our collaborators' maintenance of an effective sales force, marketing team, strategy and program, and medical affairs group and related functions, as well as its sales, marketing and other representatives accurately describing the drug consistent with its approved labeling;
- the price and perceived cost-effectiveness of the drug, including as compared to possible alternatives;

- the ability of patients and physicians and other providers to obtain and maintain coverage and adequate reimbursement, if any, by third-party payers, including government payers;
- the ability and desire of group purchasing organizations, or GPOs, including distributors and other network providers, to sell the drug to their constituencies;
- introduction of counterfeit or unauthorized versions of the drug;
- to the extent the drug is approved and marketed in a jurisdiction with a significantly lower price than in another jurisdiction, the impact of the lower pricing in the higher-priced territory, including on the pricing of reimbursement, if available, and by the diversion of lower-priced of the drug into the higher-priced territory; and
- the availability of adequate commercial manufacturing and supply chain for the drug.

**Our drugs may not be commercially successful if not widely covered and adequately reimbursed by third-party payers, and we may depend on others to obtain and maintain third-party payer access; inadequate third-party coverage and reimbursement could make entering into agreements with pharmaceutical companies to collaborate or commercialize our drugs more difficult and diminish our revenues.**

Our and our collaborators' and licensee's ability to successfully commercialize any of our drugs that have been or may be approved will depend, in part, on government regulation and the availability of coverage and adequate reimbursement from third-party payers, including private health insurers and government payers, such as the Medicaid and Medicare programs, increases in government-run, single-payer health insurance plans and compulsory licenses of drugs. We expect government and third-party payers will continue their efforts to contain healthcare costs by limiting coverage and reimbursement levels for new drugs. In addition, many countries outside of the United States have nationalized healthcare systems in which the government pays for all such products and services and must approve product pricing. A government or third-party payer decision not to approve pricing, or provide adequate coverage and reimbursements, for our drugs, if any, could limit market acceptance of and demand for our drugs.

It is increasingly difficult to obtain coverage and adequate reimbursement levels from third-party payers, and significant uncertainty exists as to the coverage and reimbursement of newly approved prescription drug products. We or our collaborators also face competition in negotiating for coverage from pharmaceutical companies and others with competitive drugs or other treatment, and these competitors may have significantly more negotiating leverage or success with respect to individual payers than we or our collaborators may have.

Federal and state healthcare reform measures that have been or may be implemented in the future, may result in more rigorous coverage criteria, more limited coverage and downward pressure on the price that we may receive for any approved product, which could seriously decrease our future revenues. The Patient Protection and Affordable Care Act, as amended, or the ACA, which was enacted in 2010, is one such healthcare reform measure that has made a number of substantial changes in the way healthcare is financed by both governmental and private insurers. In the years since its enactment, there have been, and continue to be, significant developments in, and continued legislative, executive, and judicial activity around, attempts to repeal, replace, or modify the ACA. While Congress has not passed comprehensive repeal legislation, two bills affecting the implementation of certain taxes under the ACA have been signed into law. The Tax Cuts and Jobs Act of 2017, or TCJA, includes a provision repealing, effective January 1, 2019, the tax-based shared responsibility payment imposed by the ACA on certain individuals who fail to maintain qualifying health coverage for all or part of a year that is commonly referred to as the "individual mandate". Additionally, on January 22, 2018, President Trump signed a continuing resolution on appropriations for fiscal year 2018 that delayed the implementation of certain ACA-mandated fees, including the so-called "Cadillac" tax on certain high cost employer-sponsored insurance plans, the annual fee imposed on certain health insurance providers based on market share, and the medical device excise tax on non-exempt medical devices. Further, the Bipartisan Budget Act of 2018, or the BBA, among other things, amends amended the ACA, effective January 1, 2019, to increase from 50 percent to 70 percent the point-of-sale discount that is owed by pharmaceutical manufacturers who participate in Medicare Part D and to close the coverage gap in most Medicare drug plans, commonly referred to as the "donut hole". In July 2018, the United States Department of Health and Human Services' Centers for Medicare & Medicaid Services, or CMS, published a final rule permitting further collections and payments to and from certain ACA qualified health plans and health insurance issuers under the ACA risk adjustment program in response to the outcome of federal district court litigation regarding the method CMS uses to determine this risk adjustment. On December 14, 2018, a Texas U.S. District Court Judge ruled that the ACA is unconstitutional in its entirety because the "individual mandate" was repealed by Congress as part of the TCJA. While the Texas U.S. District Court Judge, as well as the Trump administration and CMS, have stated that the ruling will have no immediate effect pending appeal of the decision, it is unclear how this decision, subsequent appeals, and other efforts to repeal and replace the ACA will impact the ACA and our business and operations.

Further, there has been heightened governmental scrutiny in the United States and other countries of pharmaceutical pricing practices in light of the rising cost of prescription drugs and biologics. In the United States, such scrutiny has resulted in congressional

inquiries and proposed and enacted federal and state legislation designed to, among other things, bring more transparency to product pricing, review the relationship between pricing and manufacturer patient programs, and reform government program reimbursement methodologies for drugs. Any reduction in reimbursement from Medicare or other government programs may result in a similar reduction in payments from private payors. For example, reimbursement has been challenging for BELVIQ, including because Medicare explicitly excludes coverage for drugs for weight loss. The implementation of additional cost containment measures or other healthcare reforms may also limit our commercial opportunities by reducing the amount a potential collaborator or licensee is willing to pay to license our programs or drug candidates in the future, which may prevent us from being able to establish and maintain collaborations and license agreements, generate revenue, attain profitability, or commercialize our products.

**Forecasting potential sales for drugs will be difficult, and if our projections are inaccurate, our business may be harmed and our stock price may be adversely affected.**

Our business planning requires us to forecast or make assumptions regarding demand and revenues for our drugs if they are approved despite numerous uncertainties. These uncertainties may be increased if we rely on our collaborators to conduct commercial activities and provide us with accurate and timely information. Actual results may deviate materially from projected results for various reasons, including the following, as well as risks identified in other risk factors:

- the rate of adoption in the particular market, including fluctuations in demand for various reasons, such as fluctuations related to economic changes, national and world events, holidays and seasonal changes;
- pricing (including discounting or other promotions), reimbursement, product returns or recalls, competition, labeling, DEA scheduling, adverse events and other items that impact commercialization;
- lack of patient and physician familiarity with the drug;
- lack of patient use and physician prescribing history;
- lack of commercialization experience with the drug;
- actual sales to patients may significantly differ from expectations based on sales to wholesalers; and
- uncertainty relating to when the drug may become commercially available to patients and rate of adoption in other territories.

Revenues from drug sales may be based in part on estimates, judgment and accounting policies, and incorrect estimates or regulators' or others' disagreement regarding such estimates or accounting policies may result in changes to guidance, projections or previously reported results. Expected and actual product sales and quarterly and other results may greatly fluctuate, and such fluctuations can adversely affect the market price of our common stock, perceptions of our ability to forecast demand and revenues, and our ability to maintain and fund our operations.

**Our efforts will be seriously jeopardized if we are unable to attract and retain key and other employees.**

Our success depends on the continued contributions of our principal management, development and scientific personnel, and the ability to hire and retain key and other personnel. We face competition for such personnel, and we believe that risks and uncertainties related to our business may impact our ability to hire and retain key and other personnel. If we do not recruit and retain effective management and other key employees, particularly our executive officers, our operations, our ability to generate or raise additional capital, and our business in general may be adversely impacted. For example, to execute our clinical programs, our strategy is to maintain a sufficient and robust clinical expertise and program management function. We are in the process of modifying and building this function, and we may not be able to establish the function we believe necessary to support our clinical goals and meet our corporate objectives.

**We are expanding our organization and may experience difficulties in managing this growth, which could disrupt our operations.**

We are seeking to expand our employee base to increase our managerial, scientific, operational, manufacturing supply, commercial, financial and other resources and to hire more consultants and contractors, including in and outside of headquarters in San Diego, California. For example, in addition to our headquarters in San Diego, we currently have operations in Zug, Switzerland, and Boston, Massachusetts. Future growth will impose significant additional responsibilities on our management, including the need to identify, recruit, maintain, motivate and integrate additional employees, consultants and contractors. Also, our management may need to divert attention away from our day-to-day activities and devote a substantial amount of time to managing these growth activities. We may not be able to effectively manage the expansion of our operations, which may result in weaknesses in our infrastructure, give rise to operational mistakes, loss of business opportunities, loss of employees and reduced productivity among remaining employees. Our future growth could require significant capital expenditures and may divert financial resources from other

projects, such as the development of additional product candidates. Moreover, if our management is unable to effectively manage our growth, our expenses may increase more than expected, our ability to generate and/or grow revenues could be reduced, and we may not be able to implement our business strategy. Our future financial performance and our ability to develop and then commercialize any approved products and compete effectively will depend, in part, on our ability to effectively manage any future growth.

**Data generated or analyzed with respect to product use in the market or required postmarketing or other studies or trials may result in decreased demand, lower sales, product recall, regulatory action or litigation.**

An NDA holder (or the equivalent outside the United States) is responsible for assessing and monitoring the safety of a drug that has been approved for marketing, including reviewing reports of adverse safety events. In addition, NDA holders often conduct additional studies or trials or analyze new or previous data related to an approved drug, including with respect to required postmarketing studies and in connection with seeking additional regulatory approvals in new territories.

Any new data generated, including from adverse event reports or required postmarketing, registration or other studies or trials, may result in label changes, adversely affect sales or development, result in withdrawal of the drug from the market, or result in litigation. In addition, analyses of previous data can have similar risks. Regulatory agencies may consider the new data or analyses in reviewing marketing applications for lorcaserin in their territories or impose post-approval requirements that require significant additional expenditures. Furthermore, the discovery of significant problems with a product or class of products similar to any approved drug could have an adverse effect on our or our collaborator's or licensee's commercialization.

**The commercialization and continuing development of lorcaserin may be adversely impacted by cardiovascular side effects associated with drugs used for the treatment of obesity.**

We developed lorcaserin to more selectively stimulate the serotonin 2C receptor than did fenfluramine or dexfenfluramine because we believe this may avoid the cardiovascular side effects associated with fenfluramine and dexfenfluramine (often used in combination with phentermine, the combination of which was commonly referred to as "fen-phen"). These two drugs were serotonin-releasing agents and non-selective serotonin receptor agonists, and were withdrawn from the market in 1997 after reported incidences of heart valve disease and pulmonary hypertension associated with their usage.

We may not be correct in our belief that more selectively stimulating the serotonin 2C receptor will avoid these undesired side effects, or lorcaserin's selectivity profile may not be adequate to avoid these side effects. The safety issues that have affected other weight loss drugs may result in increased regulatory scrutiny of the safety of lorcaserin, may raise potential adverse publicity and may affect product sales or result in litigation.

**If we license or otherwise partner our drugs, our failure to maintain such agreements or poor performance under such agreements could negatively impact our business.**

Our collaborators and licensees may have primary responsibility for the regulatory approval and, ultimately, marketing and distribution of our drug candidate in the territory or territories under the applicable collaboration. We may have limited or no control over the amount and timing of resources that any of these collaborators will dedicate to such activities. This is the case for our ralinepag exclusive license agreement with United Therapeutics and our lorcaserin Transaction Agreement with Eisai.

When we enter collaboration and license agreements, we are subject to a number of other risks, including:

- our collaborators and licensees may not comply with applicable regulatory guidelines, which could adversely impact the commercialization or development of the drug candidate;
- there could be disagreements regarding the agreements or the study or development that delay or terminate the commercialization, research, study or development, delay or eliminate potential payments under the agreements or increase our costs under or outside of the agreements;
- our collaborators and licensees may not effectively allocate adequate resources or may have limited experience in a particular territory; and
- our collaborators and licensees may not perform as expected, including with regard to making any required payments, and the agreements may not provide adequate protection or may not be effectively enforced.

We or our collaborators or licensees might terminate our agreements in certain circumstances or amend the terms of our agreement, and investors and analysts may not view any termination or amendments as favorable.

**We rely on other companies, including third-party manufacturers and sole-source suppliers, to manufacture all our drugs and drug candidates, and we or such other companies may encounter failures or difficulties or not receive or provide adequate supply, which could adversely affect development or commercialization.**

We do not own or operate manufacturing facilities that can produce active pharmaceutical ingredient, or API, intermediates and other material required to make our drug candidates or lorcaserin. Instead, we rely on other companies to supply API, intermediates and other materials. Certain of these materials are available from only one or a small number of suppliers, and using a new supplier, if available, could result in substantial delay and greater cost. Our and our manufacturers' dependence on single or limited sources of materials may adversely affect our ability to develop and deliver drug products on a timely and competitive basis, or at all.

Any performance failure on the part of us or a third-party manufacturer could result in a product recall or seizure, delay or otherwise adversely affect sales of an approved product or the clinical development or regulatory approval of lorcaserin or one or more of our other drug candidates. We or third-party manufacturers may encounter difficulties involving production yields, regulatory compliance, lot release, quality control and quality assurance, as well as shortages of qualified personnel.

The ability to adequately and timely manufacture and supply drug product is dependent on the uninterrupted and efficient operation of the manufacturing facilities, which is impacted by many manufacturing variables, including:

- availability or contamination of raw materials and components used in the manufacturing process, particularly those for which we have no other source or supplier;
- capacity of our facilities or those of our contract manufacturers;
- having the ability to adjust to changes in actual or anticipated use of the facility, including with respect to having sufficient capacity and a sufficient number of qualified personnel;
- facility contamination by microorganisms or viruses or cross contamination;
- compliance with regulatory requirements, including inspectional notices of violation and warning letters;
- maintenance and renewal of any required licenses or certifications;
- changes in actual or forecasted demand;
- timing and number of production runs;
- production success rates and bulk drug yields; and
- timing and outcome of product quality testing.

In addition, we or our third-party manufacturers may encounter delays and problems in manufacturing our drug candidates or drugs for a variety of reasons, including accidents during operation, failure of equipment, delays in receiving materials, natural or other disasters, political or governmental unrest or changes, social unrest, intentional misconduct or other factors inherent in operating complex manufacturing facilities. Commercially available starting materials, reagents and excipients may be or become scarce or more expensive to procure, and we may not be able to obtain favorable terms in agreements with subcontractors. We or our third-party manufacturers may not be able to operate our respective manufacturing facilities in a cost-effective manner or in a time frame that is consistent with our expected future manufacturing needs. If we or our third-party manufacturers cease or interrupt production or if our third-party manufacturers and other service providers fail to supply materials, products or services to us for any reason, such interruption could delay progress on our programs, or interrupt the commercial supply, with the potential for additional costs and lost revenues. If this were to occur, we may also need to seek alternative means to fulfill our manufacturing needs.

We may not be able to enter into or maintain agreements with manufacturers whose facilities and procedures comply with applicable law. Manufacturers are subject to ongoing periodic inspection (which may be unannounced) by the FDA, the DEA, corresponding state and foreign authorities and other regulatory authorities to ensure strict compliance with Current Good Manufacturing Practices, or cGMPs, regulations and other applicable government regulations and corresponding foreign standards. We do not have control over a third-party manufacturer's compliance with these regulations and standards. If we or one of our manufacturers or other company in the supply chain fail to maintain compliance or otherwise experience setbacks, we or they could be subject to civil or criminal penalties, the production of one or more of our drug candidates or lorcaserin could be interrupted or suspended, or our product could be recalled or withdrawn, resulting in delays, additional costs and potentially lost revenues.

**Our drug candidates are subject to extensive regulation, and we may not receive required regulatory approvals, or timely approvals, for any of our drug candidates.**

Preclinical and clinical development, manufacturing, labeling, packaging, storage, recordkeeping, advertising, promotion, export, marketing and distribution, and other activities relating to developing and manufacturing drugs are subject to extensive

regulation by the FDA and other regulatory agencies. We and others we contract with are subject to periodic inspections (which may be unannounced) by the FDA, the DEA and other regulatory agencies. Failure to comply with applicable regulatory requirements may, either before or after product approval, subject us to administrative or judicially imposed sanctions that may negatively impact research and development or commercialization, or otherwise negatively impact our business. Regulatory agencies have in the past inspected certain aspects of our business, and we were provided with observations of objectionable conditions or practices with respect to our business. There is no assurance that regulatory agencies will not provide us with observations in future inspections or that we satisfactorily addressed observations provided to us in past inspections.

Regulatory approval of a drug candidate is not guaranteed, and our business and reputation may be harmed by any failure or significant delay in receiving regulatory approval. The number and types of preclinical studies and clinical trials that will be required for FDA approval varies depending on the drug candidate, the disease or condition that the drug candidate is designed to target and the regulations applicable to any particular drug candidate. Despite the time and expense exerted in preclinical and clinical studies, failure can occur at any stage, and we could encounter problems that cause us to abandon clinical trials or to repeat or perform additional preclinical studies and clinical trials.

We cannot predict when or whether, or assure you that, our collaborators' or our past or any future regulatory submissions or responses will be sufficient to the applicable regulatory authority or others, that the applicable regulatory authority or others will consider data or our analyses, interpretations or procedures related to any of our drug candidates as sufficient or persuasive, or that any regulatory authority will ever approve any of our drug candidates in the future.

To market any drugs outside of the United States, we and our current or future collaborators must comply with numerous and varying regulatory requirements of other countries. Approval procedures vary among countries and can involve additional product testing and additional administrative review periods. The time required to obtain approval in other countries might differ from that required to obtain FDA approval. The regulatory approval process in other countries may include all of the risks associated with FDA approval as well as additional risks, some of which may be unanticipated. The approval by the FDA or any other regulatory authority does not assure or predict with any certainty that any other regulatory authority will approve the drug.

In addition, existing regulatory policies and laws may change. We cannot predict the likelihood, nature or extent of new government regulation, either in the United States or in other countries, or the impact on our drug candidates or drugs. For example, new FDA regulation could delay or prevent marketing approvals, increase the cost of research and development, and result in narrower product labeling and expensive post-marketing requirements.

**Our activities and drugs will still be subject to extensive postmarketing regulation if approved.**

Following regulatory approval of any of our drug candidates, we and our collaborators will be subject to ongoing obligations and continued regulatory review from the FDA and other applicable regulatory agencies, such as continued adverse event reporting requirements. There may also be additional postmarketing obligations imposed by the FDA or other regulatory agencies. These obligations may result in significant expense and limit the ability to commercialize such drugs.

The FDA or other regulatory agencies may also require that the sponsor of the NDA or foreign equivalent, as applicable, conduct additional clinical trials to further assess approved drugs after approval under a post-approval commitment. Such additional studies may be costly and may impact the commercialization of the drug. Unfavorable trial results from postmarketing studies could negatively impact market acceptance of the drug; limit the revenues we generate from sales; result in the drug's withdrawal from the market; negatively impact the potential approval of the drug in other territories; and result in litigation.

The FDA or other regulatory agencies may also impose significant restrictions on the indicated uses for which a drug may be marketed. Additionally, the FDA may require a Risk Evaluation and Mitigation Strategies, or REMS, study, including in connection with a drug's approval, to help ensure that the benefits of the drug outweigh its risks. A REMS may be required to include various elements, such as a medication guide or patient package insert, a communication plan to educate healthcare providers of the drug's risks, limitations on who may prescribe or dispense the drug, requirements that patients enroll in a registry or undergo certain health evaluations or other measures that the FDA deems necessary to ensure the safe use of the drug.

With regard to any of drug that receives regulatory approval, the labeling, packaging, adverse event reporting, storage, advertising and promotion for the drug will be subject to extensive regulatory requirements. We and the manufacturers of our products are also required to comply with cGMP regulations, which include requirements relating to quality control and quality assurance, as well as the corresponding maintenance of records and documentation. Further, regulatory agencies must approve these manufacturing facilities before they can be used to manufacture our products, and these facilities are subject to ongoing regulatory inspections. In addition, regulatory agencies subject a drug, its manufacturer and the manufacturer's facilities to continual review and inspections. The subsequent discovery of previously unknown problems with a drug, including adverse events of unanticipated severity or frequency, or problems with the facility where the drug is manufactured, may result in restrictions on the marketing of that drug, up to and including withdrawal of the drug from the market. In the United States, the DEA and comparable state-level agencies also heavily

regulate the manufacturing, holding, processing, security, recordkeeping and distribution of drugs that are considered controlled substances, and the DEA periodically inspects facilities for compliance with its rules and regulations.

**Our ability to generate revenues from any of our drugs that receive regulatory approval will be subject to a variety of risks, many of which are out of our control.**

Any drug that may be approved for marketing may not gain market acceptance among patients, healthcare providers, healthcare payers or the medical community. We believe that the degree of market acceptance and our ability to generate revenues from such products will depend on a number of factors, including:

- timing of market introduction of our drugs and competitive drugs and alternative treatments;
- actual and perceived efficacy and safety of our drugs;
- incidence and severity of any side effects;
- potential or perceived advantages or disadvantages as compared to alternative treatments;
- effectiveness of sales, marketing and distribution support;
- price of our future products, both in absolute terms and relative to alternative treatments;
- the general marketplace for the particular drug;
- the effect of current and future healthcare laws on our drug candidates;
- availability of coverage and adequate reimbursement from government and other third-party payers; and
- product labeling or product insert requirements of the FDA or other regulatory authorities.

If our approved drugs fail to achieve market acceptance, we may not be able to generate significant revenues to be profitable.

**Collaboration and license agreement relationships may lead to disputes and delays in drug development and commercialization, and we may not realize the full commercial potential of our drug candidates or drugs.**

We may have conflicts with our prospective, current or past collaborators or licensees, such as conflicts concerning rights and obligations under our agreements, the interpretation of preclinical or clinical data, the achievement of milestone or other payments, the ownership of intellectual property, or research and development, regulatory, commercialization or other strategy. Collaborators or licensees may stop supporting our drug candidates or drugs, including if they no longer view the program as in their best financial or other interests or they develop or obtain rights to competing drug candidates or drugs. In addition, collaborators or licensees may fail to effectively develop, obtain approval for or commercialize our drugs, which may result in us not realizing their full commercial potential. If any conflicts arise with any of our current, past or prospective collaborators or licensees, the other party may act in a manner that is adverse to our interests. Any such disagreement could result in one or more of the following, each of which could delay, or lead to termination of, development or commercialization of our drug candidates or drugs, and in turn prevent us from generating revenues:

- unwillingness on the part of a collaborator or licensee to pay for studies or other research, milestones, royalties or other payments that we believe are due to us under a collaboration;
- uncertainty regarding ownership of intellectual property rights arising from our collaboration or license agreement activities, which could prevent us from entering into additional collaborations;
- unwillingness on the part of a collaborator or licensee to keep us informed regarding the progress of its development, regulatory, commercialization, pharmacovigilance or other activities or to permit public disclosure of the results of those activities;
- slowing or cessation of a collaborator's or licensee's research, development, regulatory or commercialization efforts with respect to our drug candidates or drugs; or
- litigation or arbitration.

**Setbacks and consolidation in the pharmaceutical and biotechnology industries could make entering into agreements with pharmaceutical companies to collaborate or commercialize our drugs more difficult and diminish our revenues.**

Setbacks in the pharmaceutical and biotechnology industries, such as those caused by safety concerns relating to drugs or drug candidates, as well as competition from generic drugs, litigation and industry consolidation, may have an adverse effect on us,

including by making it more difficult to enter into agreements with pharmaceutical companies to collaborate or commercialize our drugs and diminishing our revenues. For example, the FDA may be more cautious in approving our drug candidates based on safety concerns relating to these or other drugs or drug candidates, or pharmaceutical companies may be less willing to enter into new collaborations or continue existing collaborations if they are integrating a new operation as a result of a merger or acquisition or if their therapeutic areas of focus change following a merger.

**We and our collaborators rely on third parties to conduct clinical trials and preclinical studies. If those parties do not comply with regulatory and contractual requirements, successfully carry out their contractual obligations or meet expected deadlines, our drug candidates may not advance in a timely manner or at all.**

In the course of our discovery, preclinical testing and clinical trials, we and our collaborators rely on third parties, including investigators, clinical research organizations, manufacturers and laboratories, to perform critical services. For example, we rely on third parties to conduct our clinical trials and many of our preclinical studies. Clinical research organizations are responsible for many aspects of the trials, including finding and enrolling subjects for testing and administering the trials. Although we rely on these third parties to conduct our clinical trials, we are responsible for ensuring that each of our clinical trials is conducted in accordance with its investigational plan and protocol. Moreover, the FDA and foreign regulatory authorities require us to comply with regulations and standards, commonly referred to as Good Clinical Practices, or GCPs, for conducting, monitoring, recording and reporting the results of clinical trials to ensure that the data and results are scientifically credible and accurate and that the trial subjects are adequately informed of the potential risks of participating in clinical trials. Our reliance on third parties does not relieve us of these responsibilities and requirements. These third parties may not be available when we need them or, if they are available, may not comply with all regulatory and contractual requirements or may not otherwise perform their services in a timely or acceptable manner, and we may need to enter into new arrangements with alternative third parties and our preclinical studies or clinical trials may be extended, delayed or terminated. These independent third parties may also have relationships with other commercial entities, some of which may compete with us. In addition, if such third parties fail to perform their obligations in compliance with regulatory requirements and our protocols, our preclinical studies or clinical trials may not meet regulatory requirements or may need to be repeated. As a result of our dependence on third parties, we may face delays or failures outside of our direct control. These risks also apply to the development activities of collaborators, and we do not control their research and development, clinical trial or regulatory activities.

**We may participate in new strategic transactions that could impact our liquidity, increase our expenses, present significant distractions to our management and be viewed as unfavorable.**

From time to time we consider strategic transactions, such as out-licensing or in-licensing of compounds or technologies, acquisitions of companies and asset purchases. Additional potential transactions we may consider include a variety of different business arrangements, such as strategic collaborations, joint ventures, spin-offs, restructurings, divestitures, business combinations and investments. In addition, another entity may pursue us as an acquisition target. Any such transaction may be viewed as unfavorable by our stockholders or others and may require us to incur non-recurring or other charges, may create potential liabilities, may increase our near- and long-term expenditures and may pose significant integration challenges, require additional expertise or disrupt our management or business, which could harm our operations and financial results.

As part of an effort to enter into significant transactions, we conduct business, legal and financial due diligence with the goal of identifying and evaluating material risks involved in the transaction. Despite our efforts, we ultimately may be unsuccessful in ascertaining or evaluating all such risks and, as a result, might not realize the intended advantages of the transaction. If we fail to realize the expected benefits from any transaction we may consummate, whether as a result of unidentified risks, integration difficulties, regulatory setbacks or other events, our business, results of operations and financial condition could be adversely affected.

**We may incur substantial liabilities for any product liability claims or otherwise as a drug product developer.**

We develop, test, manufacture and expect to commercialize drugs for use by humans. We face an inherent risk of product liability exposure related to the testing of our drug candidates in clinical trials, and a risk with the commercialization of lorcaserin as well as any other drug that may be approved for marketing.

Whether or not we are ultimately successful in any product liability or related litigation, such litigation would consume substantial amounts of our financial and managerial resources, and might result in adverse publicity, all of which would impair our business. In addition, damages awarded in a product liability action could be substantial and could have a negative impact on our financial condition.

An individual may bring a liability claim against us if one of our drugs or drug candidates causes, or merely appears to have caused, an injury. Regardless of merit or eventual outcome, liability claims may result in:

- decreased demand for our drug;
- injury to our reputation;
- increased difficulty to attract, or withdrawal of, clinical trial subjects;
- costs of related litigation;
- substantial monetary awards to subjects or other claimants;
- loss of revenues; and
- the inability to commercialize our drug candidates.

We have limited product liability insurance that covers our clinical trials and products. We may not be able to maintain or obtain insurance coverage at a reasonable cost, and we may not have insurance coverage that will be adequate to satisfy any liability that may arise, which could have an adverse effect on our results of operations and financial condition.

Arena GmbH manufactured BELVIQ and other products for commercialization or clinical trials, up until the sale of our manufacturing business to Siegfried effective March 31, 2018. Even after the sale, we could be subject to liability for manufacturing defect claims relating to our manufacturing activities that preceded the closing of the sale. For example, under our agreement with Eisai, we and Eisai will each bear 50% of losses arising from any alleged defective manufacturing of BELVIQ by Arena GmbH prior to the date of the sale to Siegfried.

**We have significant contractual obligations that may adversely affect our cash flow, cash position and stock price.**

We have long-term leases on real properties and other contractual obligations, and limited revenues. If we are unable to generate cash from operations in the future sufficient to meet our financial obligations, we will need to obtain additional funds from other sources, at all or on terms favorable to our stockholders or us.

Also, if we do not have sufficient cash in the future and are unable to generate cash from operations or obtain additional funds from other sources sufficient to meet our contractual obligations, we may have to delay or curtail some or all of our development and commercialization programs, sell or license some or all of our assets on terms that you or others may view as unfavorable, or default under our agreements.

**We may be subject, directly or indirectly, to federal and state healthcare laws, including but not limited to fraud and abuse and false claims laws. If we are unable to comply, or have not fully complied, with such laws, we could face substantial penalties and prosecution.**

In the United States, drug manufacturers and marketers are subject to various state and federal fraud and abuse laws, including, without limitation, the Federal Anti-Kickback Statute and Federal False Claims Act. There are similar laws in other countries. These laws may impact, among other things, the research, manufacturing, sales, marketing and education programs for our drugs.

The Federal Anti-Kickback Statute prohibits persons and entities from knowingly and willingly soliciting, offering, receiving or providing any remuneration, directly or indirectly, in exchange for or to induce either the referral of an individual, or the purchase, lease, order or the furnishing or arranging for, a good, item, facility 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. Several courts have interpreted the statute's intent requirement to mean that if any one purpose of an arrangement involving remuneration is to induce referrals of federal healthcare covered business, the statute has been violated. The Federal Anti-Kickback Statute is broad and, despite a series of narrow statutory exceptions and regulatory safe harbors, prohibits many arrangements and practices that are lawful in businesses outside of the healthcare industry. Moreover, the ACA, among other things, amended the intent requirement of the Federal Anti-Kickback Statute and certain criminal healthcare fraud statutes. A person or entity no longer needs to have actual knowledge of these statutes or specific intent to violate them. The ACA also provides that 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 Civil False Claims Act. Many states have also adopted laws similar to the Federal Anti-Kickback Statute, some of which apply to the referral of patients for healthcare items or services reimbursed by any source, not only the Medicare and Medicaid programs.

The Federal Civil False Claims Act prohibits, among other things, persons or entities from knowingly presenting, or causing to be presented, a false claim to, or the knowing use of false statements to obtain payment from the federal government. Suits filed under the Federal Civil False Claims Act can be brought by any individual on behalf of the government, known as "qui tam" actions, and

such individuals, commonly known as "whistleblowers," may share in any amounts paid by the entity to the government in fines or settlement. The filing of qui tam actions has caused a number of pharmaceutical, medical device and other healthcare companies to have to defend a Federal Civil False Claims Act action. When an entity is determined to have violated the Federal Civil False Claims Act, it may be required to pay up to three times the actual damages sustained by the government, plus civil penalties for each separate false claim, in addition to other penalties that may apply. Various states have also enacted laws modeled after the Federal Civil False Claims Act, some of which are broader in scope and may apply regardless of payer.

The Federal Health Insurance Portability and Accountability Act of 1996, or HIPAA, created federal criminal statutes that prohibit, among other actions, knowingly and willfully executing, or attempting to execute, a scheme to defraud any healthcare benefit program, including private third-party payers, knowingly and willfully embezzling or stealing from a healthcare benefit program, willfully obstructing a criminal investigation of a healthcare offense, and knowingly and willfully falsifying, concealing or covering up 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. Additionally, 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 Physician Payments Sunshine Act, created under the ACA, and its implementing regulations requires certain manufacturers of drugs, devices, biologicals and medical supplies for which payment is available under Medicare, Medicaid or the Children's Health Insurance Program (with certain exceptions) to report annually to the US 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.

We may be subject to data privacy and security regulation by both the federal government and the states in which we conduct our business. HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act, or HITECH, and their respective implementing regulations, impose specified requirements relating to the privacy, security and transmission of individually identifiable health information. Further, we may also be subject to state health information privacy and data breach notification laws which govern the collection, use, disclosure, and protection of health-related and other personal information, many of which differ from each other in significant ways and often are not pre-empted by HIPAA, thus requiring additional compliance efforts.

Additionally, the Drug Supply Chain Security Act imposes obligations on manufacturers of pharmaceutical products, among others, related to product tracking and tracing. Among the requirements, manufacturers will be required to provide certain information regarding the drug product to individuals and entities to which product ownership is transferred, label drug product with a product identifier, and keep certain records regarding the drug product. The transfer of information to subsequent product owners by manufacturers will eventually be required to be done electronically. Manufacturers will also be required to verify that purchasers of the manufacturers' products are appropriately licensed. Further, manufacturers will have drug product investigation, quarantine, disposition, and notification responsibilities related to counterfeit, diverted, stolen, and intentionally adulterated products, as well as products that are the subject of fraudulent transactions or which are otherwise unfit for distribution such that they would be reasonably likely to result in serious health consequences or death.

We are unable to predict whether we could be subject to actions under any of these fraud and abuse or other laws, or the impact of such actions. If we are found to be in violation of any of the laws described above and other applicable state and federal fraud and abuse laws, we may be subject to penalties, including civil, criminal and/or administrative penalties, damages, fines, individual imprisonment, disgorgement, possible exclusion from government healthcare reimbursement programs, integrity oversight and reporting obligations to resolve allegations of non-compliance with these laws, and the curtailment or restructuring of our operations, all of which could have a material adverse effect on our business and results of operations.

**We may not be able to effectively integrate, manage or maintain our international operations, and such difficulty could adversely affect our business operations, financial condition, results of operations and stock price.**

We have certain clinical operations personnel in Switzerland, and we engage in clinical trials and manufacturing activities in many territories outside of the United States. There are significant risks associated with foreign operations, including, but not limited to, compliance with local laws and regulations, the protection of our intellectual property, the ability to integrate our corporate culture with local customs and cultures, the distraction to our management, foreign currency exchange rates and the impact of shifts in the United States and local economies on those rates, and integration of our policies and procedures, including disclosure controls and procedures and internal control over financial reporting, with our international operations.

With respect to local laws and regulations, the European Union, Switzerland and certain other foreign territories have restrictions on the transfer, use and maintenance of certain personal data, including providing that transfers of personal data outside of their territories may only take place if the country to which the personal data is transferred ensures an "adequate" level of privacy protection. The European Commission has previously found that the United States did not provide adequate levels of protection. In

addition, the European Commission has approved a data protection regulation, known as the General Data Protection Regulation, or GDPR, which became effective on May 25, 2018. The GDPR contains provisions specifically directed at the processing of health information, higher sanctions and extra-territoriality measures intended to bring non-EU companies under the regulation. We conduct clinical trials in the EU, and in the future we may expand our business operations to include additional operations in the EU. With such expansion, we would be subject to increased governmental regulation, including the GDPR, in the EU countries in which we operate, including restrictions on data transfers that may negatively impact our ability and increase our costs to maintain international operations.

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

**We and third parties we contract with use hazardous materials in our operations.**

Our activities involve the use of materials that could be hazardous to human health and safety or the environment. We cannot completely eliminate the risks associated with their use, storage or disposal, which could cause:

- interruption of our development or manufacturing efforts;
- injury to our employees and others;
- environmental damage resulting in costly clean up; and
- liabilities under domestic or foreign laws and regulations governing the use, storage, handling and disposal of these materials and specified waste products.

In such an event, we may be held liable for any resulting damages, and any such liability could exceed our resources. Although we carry insurance in amounts and type that we consider commercially reasonable, we cannot be certain that the coverage or coverage limits of our insurance policies will be adequate, and we do not have insurance coverage for losses relating to an interruption of our research and development efforts caused by contamination.

**Our business and operations might be adversely affected by business disruptions and security breaches, including any cybersecurity incidents.**

Our US operations are primarily located in a business park in San Diego. We also have certain operations in Boston, Massachusetts, and Zug, Switzerland. We depend on our facilities and on collaborators, licensees, contractors and vendors for the continued operation of our business, some of whom are located in Europe and Asia. Natural disasters or other catastrophic events, including interruptions in the supply of natural resources, political and governmental changes, disruption in transportation networks or delivery services, severe weather conditions, wildfires and other fires, explosions, actions of animal rights activists, terrorist attacks, earthquakes and wars could disrupt our operations or those of our collaborators, contractors and vendors.

We depend on the efficient and uninterrupted operation of our computer and communications systems, which we use for, among other things, sensitive company data, including our financial data, intellectual property and other proprietary business information.

While certain of our operations have business continuity and disaster recovery plans and other security measures intended to prevent and minimize the impact of IT-related interruptions, our IT infrastructure and the IT infrastructure of our current and any future collaborators, contractors and vendors are vulnerable to damage from cyberattacks, computer viruses, unauthorized access, electrical failures and natural disasters or other catastrophic events. We could experience failures in our information systems and computer servers, which could result in an interruption of our normal business operations and require substantial expenditure of financial and administrative resources to remedy. System failures, accidents or security breaches can cause interruptions in our operations and can result in a material disruption of our research and development programs and other business operations. The loss of data from completed or future studies or clinical trials could result in delays in our research, development or regulatory approval efforts and significantly increase our costs to recover or reproduce the data. Similarly, we and our licensees rely on third parties to conduct studies and clinical trials of our drug candidates, manufacture our drug candidates and lorcaserin, and warehouse, market and distribute lorcaserin, and similar events relating to these third parties' 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 liabilities and the development of any of our other drug candidates and the commercialization of drugs could be delayed or otherwise adversely affected.

Even though we believe we carry commercially reasonable business interruption and liability insurance, and our contractors may carry liability insurance that protect us in certain events, we might suffer losses as a result of business interruptions that exceed the coverage available under our and our contractors' insurance policies or for which we or our contractors do not have coverage. For example, we are not insured against a terrorist attack. Any natural disaster or catastrophic event could have a significant negative impact on our operations and financial results. Moreover, any such event could delay our research and development programs and adversely affect, which may include stopping, our commercial production.

**We and our employees and directors may be named as defendants in litigation that could result in substantial costs and divert management's attention.**

Securities class action litigation may be brought against a company following a decline in the market price of its securities. This risk is especially relevant for us because companies in the pharmaceuticals industry often experience significant stock price volatility. For example, beginning in 2010, a number of lawsuits were filed against us and certain of our employees and directors alleging we and the other defendants violated the federal securities laws by making materially false and misleading statements regarding our BELVIQ trials, thereby artificially inflating the price of our common stock. These lawsuits were settled in 2018.

While we carry liability insurance, any losses we incur in connection with any future lawsuits may not be covered by insurance in an amount sufficient to cover our losses or at all, and our assets may be insufficient to cover any amounts that exceed our insurance coverage. We may have to pay damage awards or otherwise may enter into settlement arrangements in connection with any future claims. A settlement of any of future lawsuit against us could also involve the issuance of common stock or other equity, which may dilute your ownership interest. Any payments or settlement arrangements could have material adverse effects on our business, operating results, financial condition or your ownership interest. Even if the plaintiffs' claims are not successful, any future lawsuit against us and/or our directors or executive officers could result in substantial costs and significantly and adversely impact our reputation and divert our management's attention and resources, which could have a material adverse effect on our business, operating results or financial condition. In addition, any such lawsuits may make it more difficult to finance our operations, obtain certain types of insurance (including directors' and officers' liability insurance), and attract and retain qualified executive officers, other employees and directors.

**Negative US and global economic conditions may pose challenges to our business strategy, which relies on funding from collaborators or the financial markets, and creates other financial risks for us.**

Negative conditions in the US or global economy, including financial markets, may adversely affect our business and the business of our current and prospective collaborators, distributors and licensees, which we sometimes refer to generally as our collaborators, and others with which we do or may conduct business. The duration and severity of these conditions is uncertain. If negative economic conditions persist or worsen, we may be unable to secure funding to sustain our operations or to find suitable collaborators to advance our internal programs, even if we achieve positive results from our research and development or business development efforts. Such negative conditions could also impact commercialization of any drugs we and our collaborators and licensees develop, as well as our financial condition.

From time to time, we may maintain a portfolio of investments in marketable debt securities, which are recorded at fair value. Although we have established investment guidelines relative to diversification and maturity with the objectives of maintaining safety of principal and liquidity, we rely on credit rating agencies to help evaluate the riskiness of investments, and such agencies may not accurately predict such risk. In addition, such agencies may reduce the credit quality of our individual holdings, which could adversely affect their value. Lower credit quality and other market events, such as changes in interest rates and further deterioration in the credit markets, may have an adverse effect on the fair value of our investment holdings and cash position.

**Currency fluctuations may negatively affect our financial condition.**

We primarily spend and generate cash in US dollars and present our consolidated financial statements in US dollars. However, a portion of our expected and potential payments and receipts under our agreements are in foreign currencies. A fluctuation of the exchange rates of foreign currencies versus the US dollar may, thus, adversely affect our financial results, including cash balances, expenses and revenues. We may in the future enter into hedging transactions to try to reduce our foreign currency exposure, but there is no assurance that such transactions will occur or be successful.

**Laws, rules and regulations, including relating to public companies, may be costly and impact our ability to attract and retain directors and executive officers.**

Laws and regulations affecting public companies, including rules adopted by the SEC and by Nasdaq, as well as other laws and regulations, including, for example, of foreign governments and relating to privacy, may result in increased costs to us, particularly as we continue to develop the required capabilities in the United States and abroad to develop and commercialize our products. These laws, rules and regulations could make it more difficult or costly for us to obtain certain types of insurance, including directors' and officers' liability insurance, and we may be forced to accept reduced policy limits and coverage or incur substantially higher costs to obtain the same or similar coverage. These laws, rules and regulations could also make it more difficult for us to attract and retain qualified persons to serve on our board of directors, on our board committees or as executive officers. We cannot estimate accurately the amount or timing of additional costs we may incur to respond to these laws, rules and regulations.

**Changes in funding for the FDA, the SEC and other government agencies could hinder their ability to hire and retain key leadership and other personnel, prevent new products and services from being developed or commercialized in a timely manner or otherwise prevent those agencies from performing normal functions on which the operation of our business may rely, which could negatively impact our business.**

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

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

**Our disclosure controls and procedures and our internal control over financial reporting may not prevent potential errors and fraud**

Our management does not expect that our disclosure controls and procedures or our internal control over financial reporting will prevent all potential errors and fraud. A control system, no matter how well conceived and operated, can provide only reasonable, not absolute, assurance that the objectives of the control system are met. There are inherent limitations in all control systems, and no system of controls can provide absolute assurance that all control issues and instances of fraud, if any, or misstatements due to error, if any, within the company have been detected. While we believe that our disclosure controls and procedures and internal control over financial reporting are and have been effective at the reasonable assurance level, we intend to continue to examine and refine our disclosure controls and procedures and internal control over financial reporting and to monitor ongoing developments in these areas.

**Our ability to use net operating losses to offset future taxable income may be subject to limitations.**

As of December 31, 2018, we had federal and state net operating loss carryforwards of $1,274.2 million. Our federal net operating loss carryforwards ($869.4 million) will begin to expire, if not utilized, beginning in 2023, and our state net operating loss carryforwards ($404.8 million) begin expiring in 2028. Our net operating loss carryforwards could expire unused and be unavailable to offset future income tax liabilities. In January 2019, a taxable income generating event, the transaction pursuant to the United Therapeutics Agreement, resulted in it being more-likely-than-not that a portion of our net operating loss carryforwards would be used to offset our estimates of taxable income in 2019. If the estimates we have made, or the assumptions on which we relied, in estimating our taxable income in 2019 prove inaccurate, our net operating loss carryforwards to be used to offset our taxable income in 2019 may vary from our estimates. Under the newly enacted federal income tax law, federal net operating losses incurred in 2018 and in future years may be carried forward indefinitely, but the deductibility of such federal net operating losses is limited. It is uncertain if and to what extent various states will conform to the newly enacted federal tax law. In addition, under Section 382 of the Internal Revenue Code of 1986, as amended, and corresponding provisions of state law, if a corporation undergoes an "ownership change," which is generally defined as a greater than 50% change, by value, in its equity ownership over a three-year period, the corporation's ability to use its pre-change net operating loss carryforwards and other pre-change tax attributes to offset its post-change income or taxes may be limited. We have experienced ownership changes in the past and we may experience additional ownership changes in the future as a result of subsequent shifts in our stock ownership, some of which may be outside of our control. If an ownership change occurs and

our ability to use our net operating loss carryforwards is materially limited, it would harm our future operating results by effectively increasing our future tax obligations.

**Current and future tax laws and regulation could adversely affect our business and financial condition.**

On December 22, 2017, President Trump signed into law the Tax Cuts and Jobs Act of 2017, or TCJA, which significantly revised the Internal Revenue Code of 1986, as amended. The TCJA among other things, contained significant changes to corporate taxation, including reduction of the corporate tax rate from a top marginal rate of 35% to a flat rate of 21%, limitation of the tax deduction for interest expense to 30% of adjusted earnings (except for certain small businesses), limitation of the deduction for net operating losses to 80% of current year taxable income and elimination of net operating loss carrybacks, one time taxation of offshore earnings at reduced rates regardless of whether they are repatriated, immediate deductions for certain new investments instead of deductions for depreciation expense over time, and modifying or repealing many business deductions and credits (including reducing the business tax credit for certain clinical testing expenses incurred in the testing of certain drugs for rare diseases or conditions). Notwithstanding the reduction in the corporate income tax rate, the overall impact of the TCJA is uncertain and our business and financial condition could be adversely affected. In addition, it is uncertain if and to what extent various states will conform to this federal tax law.

**Changes or modifications in financial accounting standards, including those related to revenue recognition, may harm our results of operations.**

From time to time, the Financial Accounting Standards Board, or FASB, either alone or jointly with other organizations, promulgates new accounting principles that could have an adverse impact on our financial position, results of operations or reported cash flows. In May 2014, the FASB issued Accounting Standards Update, or ASU, No. 2014-09, *Revenue from Contracts with Customers (Topic 606)*. ASU No. 2014-09 supersedes prior revenue recognition guidance and establishes a comprehensive revenue recognition model with a broad principle that requires an entity to recognize revenue to depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. To achieve this principle, an entity identifies the contract with a customer, identifies the separate performance obligations in the contract, determines the transaction price, allocates the transaction price to the separate performance obligations and recognizes revenue when each separate performance obligation is satisfied. The FASB subsequently issued additional ASUs to clarify certain elements of the new revenue recognition guidance. The new guidance (codified as Accounting Standards Codification, or ASC, 606) allows for two methods of adoption: (a) "full retrospective" adoption, meaning the standard is applied to all periods presented, or (b) "modified retrospective" adoption, meaning the cumulative effect of applying the new guidance is recognized as an adjustment to the opening retained earnings balance for the year of implementation. We adopted the new revenue standard effective January 1, 2018, using the modified retrospective method. The cumulative impact to our accumulated deficit balance at January 1, 2018, as a result of the adoption of ASC 606 was a decrease of $19.0 million. Any difficulties in implementing this standard, adopting or implementing any other new accounting standard, or updating or modifying our internal controls as needed on a timely basis, could result in our failure to meet our financial reporting obligations, which could result in regulatory discipline and harm investors' confidence in us. Finally, if we were to change our critical accounting estimates, including those related to the recognition of revenue, our operating results could be significantly affected.

***Risks Relating to Our Intellectual Property***

**Our success is dependent on intellectual property rights held by us and third parties and our interest in these rights is complex and uncertain.**

Our success will depend on our own and on current or future collaborators' abilities to obtain, maintain and defend patents. In particular, the patents directed to our drug candidates and drugs are important to developing and commercializing drugs and our revenue. We have numerous US and foreign patents issued and patent applications pending for our technologies. There is no assurance that any of our patent applications will issue, or that any of the patents will be enforceable or will cover a drug or other commercially significant technology or method, or that the patents will be held to be valid for their expected terms.

The procedures for obtaining a patent are complex. These procedures require an analysis of the scientific technology related to the invention and many sophisticated legal issues. Obtaining patent rights outside the United States often requires the translation of highly technical documents and an improper translation may jeopardize our patent protection. Ensuring adequate quality of translators and foreign patent attorneys is often very challenging. Consequently, the process for having our pending patent applications issue as patents will be difficult, complex and time consuming. Our patent position is very uncertain and we do not know when, or if, we will obtain additional patents, or if the scope of the patents obtained will be sufficient to protect our drugs, or be considered sufficient by parties reviewing our patent positions pursuant to a potential marketing, licensing or financing transaction.

In addition, other entities may challenge the validity or enforceability of our patents in litigation or administrative proceedings. We cannot make assurances as to how much protection, if any, our patents will provide if we attempt to enforce them or they are challenged. It is possible that a competitor or a generic pharmaceutical provider may successfully challenge our patents and those challenges may result in reduction or elimination of our patent coverage.

We also rely on confidentiality agreements and trade secrets to protect our technologies. However, such information is difficult to protect. We require our employees to contractually agree not to improperly use our confidential information or disclose it to others, but we may be unable to determine if our employees have conformed or will conform to their legal obligations under these agreements. We also enter into confidentiality agreements with prospective collaborators, collaborators, service providers and consultants, but we may not be able to adequately protect our trade secrets or other proprietary information in the event of any unauthorized use or disclosure or the lawful development by others of this information. Many of our employees and consultants were, and many of them may currently be, parties to confidentiality agreements with other pharmaceutical and biotechnology companies, and the use of our technologies could violate these agreements. In addition, third parties may independently discover our trade secrets or other proprietary information.

Some of our research and development collaborators and scientific consultants have rights to publish data and information to which we have rights. We generally seek to prevent our collaborators and consultants from disclosing scientific discoveries before we have the opportunity to file patent applications on such discoveries. In some of our collaborations, we do not control our collaborators' ability to disclose their own discoveries under the collaboration and in some of our academic relationships we are limited to relatively short periods to review a proposed publication and file a patent application. If we cannot maintain confidentiality in connection with our collaborations and relationships, our ability to receive patent protection or protect our proprietary information will be impaired.

We believe that the United States is by far the largest single market for pharmaceuticals in the world. Because of the critical nature of patent rights to our industry, changes in US patent laws could have a profound effect on our future profits, if any. It is unknown which, if any, patent laws will change, how changes to the patent laws will ultimately be enforced by the courts and how it would impact our business.

**A dispute regarding the infringement or misappropriation of our proprietary rights or the proprietary rights of others could be costly and result in delays or termination of our future research, development, manufacturing and sales activities.**

Our commercial success depends upon our ability to develop and manufacture our drugs and drug candidates, market and sell drugs, and conduct our research and development activities without infringing or misappropriating the proprietary rights of others. There are many issued patents and pending patent applications owned by others relating to research and development programs that could be determined to be similar, identical or superior to ours or our licensors or collaborators. We may be exposed to future litigation by others based on claims that our drugs, drug candidates, technologies or activities infringe the intellectual property rights of others. Numerous issued patents and pending patent applications owned by others exist in the areas of our research and development, including some which purport to allow the patent holder to control the use of all drugs that modulate a particular drug target regardless of whether the infringing drug bears any structural resemblance to a chemical compound known to the patent holder at the time of patent filing. Numerous issued patents and pending patent applications owned by others also exist in the therapeutic areas in which we are developing drugs. There are also numerous issued patents and pending patent applications owned by others that are directed to chemical compounds or synthetic processes that may be necessary or useful to use in our research, development, manufacturing or commercialization activities. These could materially affect our ability to develop our drug candidates or manufacture, import or sell drugs, and our activities, or those of our licensors or collaborators, could be determined to infringe these patents. Because patent applications can take many years to issue, there may be currently pending applications, unknown to us, which may later result in issued patents that our drugs, drug candidates or technologies may infringe. There also may be existing patents owned by others, of which we are not aware, that our drug candidates or technologies may infringe. Further, there may be issued patents or pending patent applications owned by others in fields relevant to our business, of which we are or may become aware, that we believe (i) are invalid, unenforceable, or we do not infringe; (ii) relate to immaterial portions of our overall research and development, manufacturing and commercialization efforts; or (iii) in the case of pending patent applications, the resulting patent would not be granted or, if granted, would not likely be enforced in a manner that would materially impact such efforts. We cannot assure you that others holding any of these patents or patent applications will not assert infringement claims against us and seek

damages or enjoinment of our activities. We also cannot assure you that, in the event of litigation, we will be able to successfully assert non-infringement, unenforceability, invalidity or immateriality, or that any infringement claims will be resolved in our favor.

In addition, others may infringe or misappropriate our proprietary rights. We may have to institute costly legal action to protect our intellectual property rights, or we may not be able to afford the costs of enforcing or defending our intellectual property rights.

There could be significant litigation and other administrative proceedings in our industry that affect us regarding patent and other intellectual property rights. Any legal action or administrative action against us, or our collaborators, claiming damages or seeking to enjoin commercial activities relating to our research and development, manufacturing and commercialization activities could:

- require us, or our collaborators, to obtain a license which may not be available on commercially reasonable terms, if at all;
- prevent us from importing, making, using, selling or offering to sell the subject matter claimed in patents held by others and subject us to potential liability for damages;
- consume a substantial portion of our managerial, scientific and financial resources; or
- be costly, regardless of the outcome.

Furthermore, because of the substantial amount of pre-trial document and witness discovery required in connection with intellectual property litigation, there is a risk that some of our confidential information could be compromised. In addition, during the course of intellectual property litigation, there could be public announcements of the results of hearings, motions or other interim proceedings or developments. If securities analysts or investors perceive these results to be negative, it could have a substantial adverse effect on the trading price of our common stock.

We are aware of third-party patents, as well as third-party patent applications, that could adversely affect the potential commercialization of etrasimod. For example, we are aware of a third-party patent, as well as third-party patent applications, with broad claims to administering an S1P modulator by starting with a lower dose and then increasing to a higher, standard daily dose. While we do not believe that any such claims that would cover the potential commercialization of etrasimod are valid and enforceable, we may be incorrect in this belief.

We have been contacted from time to time by third parties regarding their intellectual property rights, sometimes asserting that we may need a license to use their technologies. If we fail to obtain any required licenses or make any necessary changes to our technologies, we may become involved in expensive and time-consuming litigation or we may be unable to develop or commercialize some or all of our drugs or drug candidates.

We and Eisai have filed patent infringement lawsuits against ANDA filers relating to "Paragraph IV certifications." We cannot predict the outcome of any litigation matter. For example, our existing patents could be invalidated, found unenforceable or found not to cover a generic form of lorcaserin. If an ANDA filer were to prevail in patent litigation and/or receive approval to sell a generic version of lorcaserin, lorcaserin would become subject to increased competition and our revenue would be adversely affected.

**We cannot protect our intellectual property rights throughout the world.**

Filing, prosecuting, defending and enforcing patents on all of our drug candidates throughout the world would be prohibitively expensive. The laws of some foreign countries do not protect intellectual property rights to the same extent as the laws of the United States, and many companies have encountered significant problems in protecting and defending such rights in foreign jurisdictions. Many countries, including certain countries in Europe, have compulsory licensing laws under which a patent owner may be compelled to grant licenses to third parties (for example, the patent owner has failed to "work" the invention in that country or the third party has patented improvements). In addition, many countries limit the enforceability of patents against government agencies or government contractors. In these countries, the patent owner may have limited remedies, which could materially diminish the value of the patent. Compulsory licensing of life-saving drugs is also becoming increasingly popular in developing countries either through direct legislation or international initiatives. Such compulsory licenses could be extended to include some of our drug candidates, which could limit our potential revenue opportunities. Moreover, the legal systems of certain countries, particularly certain developing countries, do not favor the aggressive enforcement of patents and other intellectual property protection, particularly those relating to pharmaceuticals, which makes it difficult for us to stop the infringement of our patents. 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.

*Risks Relating to Our Securities*

**Our stock price will likely be volatile, and your investment in our stock could decline in value.**

Our stock price has fluctuated historically. From January 1, 2017, to February 22, 2019, the market price of our stock was as low as $11.30 per share and as high as $50.40 per share.

Very few drug candidates being tested will ultimately receive regulatory approval, and companies in our industry sometimes experience significant volatility in their stock price. Our stock price may fluctuate significantly depending on a variety of factors, including:

- results or decisions affecting the development or commercialization of any of our drug candidates or drugs, including the results of studies, trials and other analyses;
- the success, failure or setbacks of our or a perceived competitor's drugs or drug candidates;
- the timing of the development of our drug candidates;
- discussions or recommendations affecting our drugs or drug candidates by the FDA or other reviewers of preclinical or clinical data or other information related to our drug candidates or drugs;
- regulatory actions or decisions or legislation affecting drugs or drug candidates, including ours and those of our competitors;
- the commercial availability and success or failure of any of our drug candidates or lorcaserin;
- the development and implementation of our continuing development and research plans, including outcome studies for lorcaserin;
- the entrance into, or failure to enter into, a new collaboration or the modification or termination of an existing collaboration or other material transaction;
- the timing and receipt by us of milestone and other payments or failing to achieve and receive the same;
- fluctuation in prescriptions, sales or financial results (including with respect to revenue recognition, expenses and other operating results) or inaccurate sales or cash forecasting;
- accounting restatements and changes;
- supply chain or manufacturing issues;
- changes in our research and development budget or the research and development budgets of our existing or potential collaborators;
- the introduction, development or withdrawal of drug candidates or drugs by others that target the same diseases and conditions that we or our collaborators target or the introduction of new drug discovery techniques;
- expenses related to, and the results of, litigation, other disputes and other proceedings;
- financing strategy or decisions;
- the allocation of our resources;
- our ability, or the perception by investors of our ability, to continue to meet all applicable requirements for continued listing of our common stock on The Nasdaq Stock Market, and the possible delisting of our common stock if we are unable to do so;
- developments in intellectual property rights or related announcements; and
- capital market conditions.

We are not able to control many of these factors. If our financial or scientific results in a particular period do not meet stockholders' or analysts' expectations, our stock price may decline, and such decline could be significant.

**Any future equity or debt issuances or other financing transactions may have dilutive or adverse effects on our existing stockholders.**

We have been opportunistic in our efforts to obtain cash, and we expect we will evaluate various funding alternatives from time to time. We may issue additional shares of common stock or convertible securities that could dilute your ownership in our company and may include terms that give new investors rights that are superior to yours. We have effective registration statements to sell shares of our common stock and certain other securities, and we may elect to sell shares pursuant to such registration from time to time.

Moreover, any issuances by us of equity securities may be at or below the prevailing market price of our common stock and in any event may have a dilutive impact on your ownership interest, which could cause the market price of our common stock to decline. In addition, we may also raise additional funds through the incurrence of debt or other financing transaction, and the investors may have rights superior to your rights in the event we are not successful and are forced to seek the protection of bankruptcy laws or the transaction may otherwise adversely affect our business prospects and existing stockholders.

**Our executive officers and directors may sell shares of their stock, and these sales could adversely affect our stock price.**

Sales of our stock by our executive officers and directors, or the perception that such sales may occur, could adversely affect the market price of our stock. Our executive officers and directors may sell stock in the future, either as part, or outside, of trading plans under Rule 10b5-1 of the SEC.

**There are a substantial number of shares of our common stock that may become eligible for future sale in the public market, and the sale of our common stock could cause the market price of our common stock to fall.**

As of February 22, 2019, there were (i) options to purchase 8,560,316 shares of our common stock outstanding under our equity incentive plans at a weighted-average exercise price of $31.80 per share, (ii) 26,694 restricted stock unit awards outstanding under our equity incentive plans, (iii) 297,000 performance restricted stock units outstanding under our equity incentive plans, and (iv) 2,712,155 additional shares of common stock remaining issuable under our Amended and Restated 2017 Long-Term Incentive Plan.

Once issued, the shares described above will be available for immediate resale in the public market. The market price of our common stock could decline as a result of such resales due to the increased number of shares available for sale in the market. As of February 22, 2019, there were 49,462,849 shares of our common stock outstanding.

**The holders of our common stock and other securities may take actions that are contrary to your interests, including selling their stock.**

A small number of stockholders may hold or acquire a significant amount of our outstanding stock. From time to time, there is a large short interest in our stock. These holders of such stock or positions may seek control of us, support transactions that we or you do not believe are favorable, and they may have interests that are different from yours. In addition, sales of a large number of shares of our stock by these large stockholders or other stockholders within a short period of time could adversely affect our stock price.

We may also be involved in disagreements with the holders of our stock, warrants or other securities in the future. Such disagreements may lead to proxy contests or litigation, which may be expensive and consume management's time, involve settlements, the terms of which may not be favorable to us, or result in other negative consequences to our business.

**Certain of our agreements, provisions in our charter documents, possible future agreements and Delaware law could delay or prevent a change in management or a takeover attempt that you may consider to be in your best interests.**

There is a standstill provision in our transaction agreement with Eisai, and we may enter into agreements with similar provisions. In addition, we may in the future adopt a stockholders' rights agreement, which would cause substantial dilution to any person who attempts to acquire us in a manner or on terms not approved by our board of directors. These provisions or agreements, as well as other provisions in our certificate of incorporation and bylaws and under Delaware law, could delay or prevent the removal of directors and other management and could make more difficult a merger, tender offer or proxy contest involving us that you may consider to be in your best interests. For example, our charter provisions:

- allow our board of directors to issue preferred stock without stockholder approval;
- limit who can call a special meeting of stockholders;
- eliminate stockholder action by written consent; and
- establish advance notice requirements for nomination for election to the board of directors or for proposing matters to be acted upon at stockholders' meetings.

**Item 1B. Unresolved Staff Comments.**

None.

**Item 2. Properties.**

As set forth in the table below, we lease approximately 281,000 square feet of research, development, warehouse and office space located at various addresses in the same business park in San Diego, California and an office space located in Zug, Switzerland.

| Location | Own/ Lease | Description |
|---|---|---|
| 6154 Nancy Ridge Drive, San Diego, California | Lease | This facility of approximately 143,000 square feet consists of approximately 131,000 square feet of office space and 12,000 square feet of warehouse space, which is partially unoccupied. |
| 6122-6124-6126 Nancy Ridge Drive, San Diego, California | Lease | This facility of approximately 68,000 square feet consists of approximately 28,500 square feet of laboratory space, 37,500 square feet of office space and 2,000 square feet of warehouse space. We sublease this facility to a third party. |
| 6114 Nancy Ridge Drive, San Diego, California | Lease | This chemical development facility consists of approximately 40,000 square feet (which includes approximately 18,000 of internal square feet and approximately 22,000 square feet of integrated external space), of which approximately 5,000 square feet is office space. We sublease this facility to a third party. |
| 6118 Nancy Ridge Drive, San Diego, California | Lease | This facility of approximately 30,000 square feet consists of approximately 30% laboratory space and 70% office space. We sublease this facility to Beacon. |
| Zug, Switzerland | Lease | We lease a total of approximately 4,500 square feet of office space. |
| Boston, Massachusetts | Lease | We lease a total of approximately 590 square feet of office space. |

We expect the above facilities to be sufficient for our business needs for at least the near term. We have significantly more space in San Diego than we expect to need for the foreseeable future, and we have subleased certain of our space.

**Item 3. Legal Proceedings.**

On September 30, 2016, we and Eisai Inc. filed a patent infringement lawsuit against Lupin Limited and Lupin Pharmaceuticals, Inc. (collectively, Lupin) in the U.S. District Court for the District of Delaware. The lawsuit relates to a "Paragraph IV certification" notification that we and Eisai Inc. received regarding an abbreviated new drug application, or ANDA, submitted to the FDA by Lupin requesting approval to engage in the commercial manufacture, use, importation, offer for sale or sale of a generic version of BELVIQ (lorcaserin hydrochloride tablets, 10 mg). In its notification, Lupin alleged that no valid, enforceable claim of any of the patents that are listed in the FDA's Approved Drug Products with Therapeutic Equivalence Evaluations, or Orange Book, for BELVIQ will be infringed by Lupin's manufacture, importation, use, sale or offer for sale of the product described in its ANDA for 10 mg lorcaserin hydrochloride tablets. Lupin is accused of infringing U.S. Patent Nos. 6,953,787; 7,514,422; 7,977,329; 8,207,158 and 8,273,734. In accordance with the Hatch-Waxman Act, as a result of filing a patent infringement lawsuit within 45 days of receipt of Lupin's notification, the FDA cannot approve Lupin's ANDA any earlier than 7.5 years from NDA approval unless a District Court finds that all of the asserted claims of the patents-in-suit are invalid, unenforceable or not infringed. On January 11, 2017, Lupin filed an answer, defenses and counterclaims to the September 30, 2016 complaint. We and Eisai Inc. filed an answer to Lupin's counterclaims on February 1, 2017. We and Eisai Inc. are seeking a determination from the court that, among other things, Lupin has infringed our patents, Lupin's ANDA for 10 mg lorcaserin hydrochloride tablets should not be approved until the expiration date of our patents, and Lupin should be enjoined from commercializing a product that infringes our patents. Trial is currently scheduled to begin on April 15, 2019. The parties have completed the expert discovery phase of the case and are now in the pretrial phase of the case.

On March 6, 2017, we and Eisai Inc. filed a patent infringement lawsuit against Teva Pharmaceuticals USA, Inc. and Teva Pharmaceutical Industries Ltd. (collectively, Teva) in the U.S. District Court for the District of Delaware. The lawsuit also relates to a "Paragraph IV certification" notification that we and Eisai Inc. received regarding an ANDA submitted to the FDA by Teva requesting approval to engage in the commercial manufacture, use, importation, offer for sale or sale of a generic version of BELVIQ XR (lorcaserin hydrochloride extended-release tablets, 20 mg). In its notification, Teva alleged that no valid, enforceable claim of any of the patents that are listed in the Orange Book for BELVIQ XR will be infringed by Teva's manufacture, importation, use, sale or offer for sale of the product described in its ANDA. Teva is accused of infringing U.S. Patent Nos. 6,953,787; 7,514,422; 7,977,329; 8,207,158 and 8,273,734. In accordance with the Hatch-Waxman Act, as a result of filing a patent infringement lawsuit within 45 days of receipt of Teva's notification, the FDA cannot approve Teva's ANDA any earlier than 7.5 years from NDA approval unless a District Court finds that all of the asserted claims of the patents-in-suit are invalid, unenforceable or not infringed. On April 18, 2017, Teva filed an amended answer, defenses and counterclaims to the March 6, 2017 complaint. We and Eisai Inc. are seeking a determination from the court that, among other things, Teva has infringed our patents, Teva's ANDA should not be approved until the expiration date of our patents, and Teva should be enjoined from commercializing a product that infringes our patents. On May 1,

2017, the Teva and Lupin actions were consolidated for all purposes and will follow the case schedule that was previously entered in the Lupin action. We and Eisai Inc. filed an answer to Teva's amended counterclaims on May 3, 2017. On or about October 16, 2017, we and Eisai Inc. received a "Paragraph IV certification" notification from Teva alleging that no valid, enforceable claim of U.S. Patent No. 9,770,455, which was listed in the Orange Book for BELVIQ and BELVIQ XR after the patent issued on September 26, 2017, will be infringed by Teva's manufacture, importation, use, offer for sale or sale of the product described in its ANDA. On October 25, 2017, we and Eisai Inc. filed a first amended complaint against Lupin and Teva, adding infringement of U.S. Patent No. 9,770,455 by their respective ANDA products to the consolidated lawsuit. On or about November 6, 2017, we and Eisai Inc. received a "Paragraph IV certification" notification from Lupin alleging that no valid, enforceable claim of U.S. Patent No. 9,770,455 will be infringed by Lupin's manufacture, importation, use, offer for sale or sale of the product described in its ANDA for 10 mg lorcaserin hydrochloride tablets.

We and Eisai Inc. also received a "Paragraph IV certification" notification from Lupin alleging that no valid, enforceable claim of any of the patents that are listed in the Orange Book for BELVIQ and BELVIQ XR will be infringed by Lupin's manufacture, importation, use, sale or offer for sale of the product described in its ANDA for 20 mg lorcaserin hydrochloride extended-release tablets. Because Lupin is not the first applicant to submit a substantially complete application containing a Paragraph IV certification for approval of a generic equivalent of BELVIQ XR, absent extenuating circumstances, Lupin would not be able to launch its 20 mg lorcaserin hydrochloride extended-release tablets before Teva was able to launch its respective product. On March 23, 2018, we and Eisai Inc. filed a second amended complaint against Lupin and Teva, adding infringement of U.S. Patent Nos. 6,953,787, 7,514,422, 7,977,329, 8,207,158, 8,273,734, and 9,770,455 by Lupin's generic equivalent of BELVIQ XR. This consolidated action against Lupin and Teva is currently in the pretrial phase of the case with trial scheduled to begin on April 15, 2019.

We cannot predict the ultimate outcome of any proceeding.

**Item 4. Mine Safety Disclosures.**

Not applicable.

## PART II

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

**Market information**

Our common stock is listed on the Nasdaq Global Select Market under the symbol "ARNA."

**Holders**

As of February 27, 2019, there were approximately 65 stockholders of record of our common stock, one of which is Cede & Co., a nominee for Depository Trust Company, or DTC. Shares of common stock that are held by financial institutions as nominees for beneficial owners are deposited into participant accounts at DTC and are considered to be held of record by Cede & Co. as one stockholder.

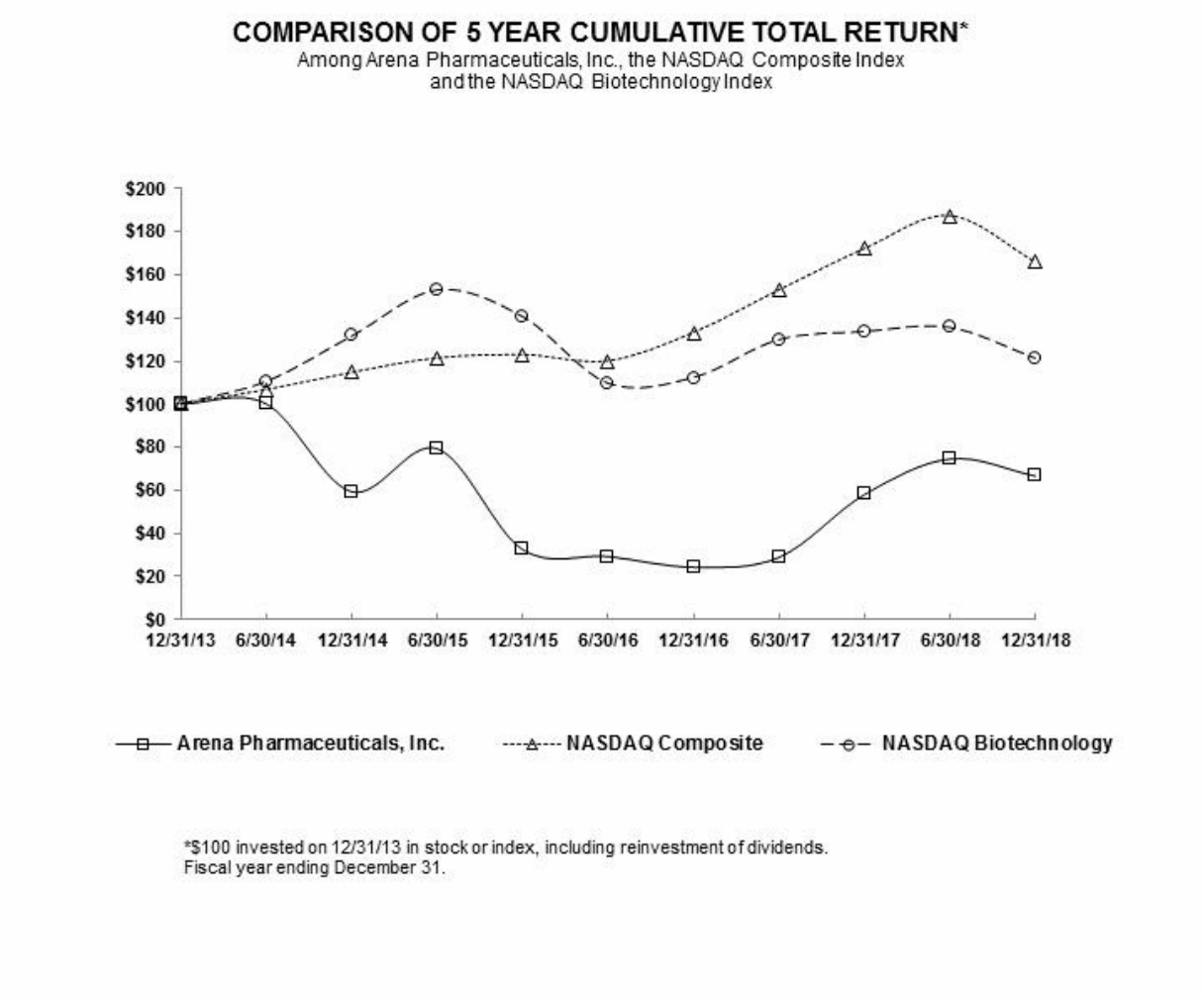
**Dividends**

We have never paid cash dividends on our capital stock. We anticipate that we will retain earnings, if any, to support operations and finance the growth and development of our business and, therefore, do not expect to pay cash dividends in the foreseeable future.

**Performance graph**

The graph below compares the cumulative five-year total return on our common stock from December 31, 2013, through December 31, 2018, to the cumulative total return over such period for (i) the Nasdaq Composite Index and (ii) the Nasdaq Biotechnology Index. The graph assumes the investment of $100 on December 31, 2013, with the reinvestment of dividends, although dividends have not been declared on our common stock, and is calculated according to the Securities and Exchange Commission's methodology. We caution that the stock price performance shown in the graph may not be indicative of future stock price performance. The graph, including each of the graph lines, was provided by Research Data Group, Inc.

*This information, including the graph below, is not deemed to be "soliciting material" or to be "filed" with the Securities and Exchange Commission, or subject to the Securities and Exchange Commission's proxy rules, other than as provided in such rules, or to the liabilities of Section 18 of the Securities Exchange Act of 1934, and shall not be deemed incorporated by reference into any prior or subsequent filing by us under the Securities Act of 1933 or the Securities Exchange Act of 1934, except to the extent that we specifically incorporate it by reference into any such filing.*



**Item 6. Selected Financial Data.**

The following Selected Financial Data should be read in conjunction with "Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations" and "Item 8. Financial Statements and Supplementary Data" included below in this Annual Report on Form 10-K.

The following amounts related to earnings per share and shares outstanding have been adjusted for all periods reported for the 1-for-10 reverse stock split that we effected in June 2017.

| | Years ended December 31, | | | | |
|---|---|---|---|---|---|
| | 2018 | 2017 | 2016 | 2015 | 2014 |
| | (In thousands, except per share data) | | | | |
| **Consolidated Statement of Operations Data:** | | | | | |
| **Revenues** | | | | | |
| Collaboration revenue | $ 11,402 | $ 19,632 | $ 92,163 | $ 13,398 | $ 18,582 |
| Royalty revenue | 6,568 | 1,705 | — | — | — |
| Total revenues | 17,970 | 21,337 | 92,163 | 13,398 | 18,582 |
| **Operating Costs and Expenses** | | | | | |
| Research and development | 115,029 | 70,988 | 63,782 | 83,283 | 89,815 |
| General and administrative | 47,724 | 30,341 | 27,529 | 30,281 | 28,985 |
| Litigation settlement expense, net | — | 11,975 | — | — | — |
| Restructuring charges | — | — | 6,115 | 3,346 | — |
| Total operating costs and expenses | 162,753 | 113,304 | 97,426 | 116,910 | 118,800 |
| Interest and other income (expense), net | 5,949 | (3,887) | (7,037) | (7,195) | 47,006 |
| Loss from continuing operations before income taxes | (138,834) | (95,854) | (12,300) | (110,707) | (53,212) |
| Income tax benefit | 110,265 | — | — | — | — |
| Loss from continuing operations | (28,569) | (95,854) | (12,300) | (110,707) | (53,212) |
| Income (loss) from discontinued operations | (830) | 3,122 | (10,596) | 2,728 | (7,296) |
| Net loss | (29,399) | (92,732) | (22,896) | (107,979) | (60,508) |
| Less net loss attributable to noncontrolling interest in consolidated variable interest entity | — | 1,325 | 380 | — | — |
| Net loss attributable to common stockholders | $ (29,399) | $ (91,407) | $ (22,516) | $ (107,979) | $ (60,508) |
| | | | | | |
| **Amounts attributable to stockholders of Arena:** | | | | | |
| Loss from continuing operations | $ (28,569) | $ (94,529) | $ (11,920) | $ (110,707) | $ (53,212) |
| Income (loss) from discontinued operations | (830) | 3,122 | (10,596) | 2,728 | (7,296) |
| | $ (29,399) | $ (91,407) | $ (22,516) | $ (107,979) | $ (60,508) |
| | | | | | |
| **Net income (loss) attributable to stockholders of Arena per share, basic and diluted:** | | | | | |
| Continuing operations | $ (0.61) | $ (2.87) | $ (0.49) | $ (4.60) | $ (2.42) |
| Discontinued operations | (0.02) | 0.10 | (0.44) | 0.11 | (0.33) |
| | $ (0.63) | $ (2.77) | $ (0.93) | $ (4.49) | $ (2.75) |
| | | | | | |
| Shares used in calculating net income (loss) per share allocable to common stockholders, basic and diluted | 47,041 | 32,990 | 24,313 | 24,067 | 21,973 |

| | As of December 31, | | | | |
|---|---|---|---|---|---|
| | 2018 | 2017 | 2016 | 2015 | 2014 |
| | | | (In thousands) | | |
| **Consolidated Balance Sheet Data:** | | | | | |
| Cash and cash equivalents | $ 161,037 | $ 158,837 | $ 90,712 | $ 156,184 | $ 163,209 |
| Total available-for-sale securities | 367,006 | 112,482 | — | — | — |
| Total assets | 686,903 | 339,275 | 169,010 | 256,792 | 276,385 |
| Total lease financing obligations | 52,709 | 61,748 | 65,266 | 68,245 | 70,737 |
| Total derivative liabilities | — | — | — | — | 474 |
| Accumulated deficit | (1,500,552) | (1,490,187) | (1,398,736) | (1,376,220) | (1,268,241) |
| Total equity | 606,258 | 207,144 | 40,395 | 53,542 | 47,345 |

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

You should read the following discussion and analysis in conjunction with "Item 8. Financial Statements and Supplementary Data" included below in this Annual Report on Form 10-K, or Annual Report. Operating results are not necessarily indicative of results that may occur in future periods.

This discussion and analysis contains forward-looking statements that involve a number of risks, uncertainties and assumptions. Actual events or results may differ materially from our expectations. Important factors that could cause actual results to differ materially from those stated or implied by our forward-looking statements include, but are not limited to, those set forth in "Item 1A. Risk Factors" in this Annual Report. All forward-looking statements included in this Annual Report are based on information available to us as of the time we file this Annual Report and, except as required by law, we undertake no obligation to update publicly or revise any forward-looking statements. In addition, statements that "we believe" and similar statements reflect our beliefs and opinions on the relevant subject. These statements are based upon information available to us as of the date of this Annual Report, and while we believe such information forms a reasonable basis for such statements, such information may be limited or incomplete, and our statements should not be read to indicate that we have conducted an exhaustive inquiry into, or review of, all potentially available relevant information. These statements are inherently uncertain.

**OVERVIEW AND RECENT DEVELOPMENTS**

We are a biopharmaceutical company focused on delivering novel, transformational medicines with optimized pharmacology and pharmacokinetics to patients globally. Our proprietary, internally-developed pipeline includes multiple potentially first- or best-in-class assets with broad clinical utility.

Our most advanced investigational clinical programs are:

- **Etrasimod**, which we are evaluating in late-stage clinical programs in ulcerative colitis and Crohn's disease, as well as progressing programs for atopic dermatitis and other indications; and
- **Olorinab** (formerly APD371) for a broad range of visceral pain conditions associated with inflammatory bowel diseases and irritable bowel syndrome, and which we are evaluating in a Phase 2 trial for treatment of gastrointestinal pain.

We continue to assess other earlier research and development stage drug candidates, including APD418, a potential first-in-class calcium-independent myofilament derepressor, which we are studying in a preclinical program for the treatment of decompensated heart failure.

Additionally, we have collaborations and license agreements with various companies, including:

- United Therapeutics Corporation, or United Therapeutics, in its efforts with respect to ralinepag,
- Everest Medicines Limited, or Everest, in its efforts with respect to etrasimod in Greater China and select countries in Asia,
- Boehringer Ingelheim International GmbH, or Boehringer Ingelheim, targeting a G protein-coupled receptor that belongs to the group of orphan central nervous system receptors, which is in preclinical development stage,
- Outpost Medicine, LLC, or Outpost Medicine, in its efforts with respect to a preclinical compound for the potential utility in treating genitourinary disorders, and
- Eisai Co., Ltd. and Eisai Inc., or collectively, Eisai, in their efforts with respect to BELVIQ/BELVIQ XR, which are marketed products.

**Collaborations and license agreement update.**

In November 2018, we entered into a collaboration and license agreement, or the United Therapeutics Agreement, with United Therapeutics. Under the United Therapeutics Agreement, we granted United Therapeutics an exclusive, worldwide, royalty-bearing license to develop, manufacture and commercialize ralinepag, and any pharmaceutical product containing ralinepag as an active ingredient. This transaction was completed on January 24, 2019. At the closing of the transaction, we transferred to United Therapeutics certain other assets relating to ralinepag, including, among others, related domain names and trademarks, permits, certain contracts, inventory, regulatory documentation, IND No. 109021 (relating to ralinepag), or the IND, and non-clinical, pre-clinical and clinical trial data. United Therapeutics has agreed to assume certain limited liabilities, including, among others, all post-closing obligations under assumed contracts and the IND. United Therapeutics will be responsible for all development, manufacture and commercialization of ralinepag globally. Upon the closing of this transaction, in January 2019, we received an upfront payment of $800.0 million. We are eligible to receive a payment of $150.0 million upon first marketing approval of ralinepag in a major non-U.S. market, and a payment of $250.0 million upon U.S. marketing approval of an inhaled formulation of ralinepag. In addition, we are

entitled to receive low double-digit, tiered royalties on net sales of ralinepag, subject to certain adjustments for third party license payments. In connection with this transaction we incurred fees of approximately $17.0 million, of which $2.4 million was incurred in 2018 and is included in general and administrative expenses in the consolidated statement of operations. We expect a significant portion of the taxable gain that would otherwise be triggered by the upfront payment will be offset by our existing net operating losses. The United Therapeutics Agreement contains various representations and warranties of Arena and United Therapeutics, and various covenants of the parties, including covenants to cooperate in seeking regulatory approvals, as well as our agreement not to compete, during the period in which royalties are payable (or during the five-year period following the closing if we are subject to a change of control transaction) in the development of a prostacyclin to treat pulmonary arterial hypertension.

In October 2018, the National Medical Products Administration of China, or NMPA, formerly known as CFDA, accepted the initial clinical trial application for an oral formulation of ralinepag. In November 2018, the NMPA accepted the initial clinical trial application for etrasimod. We have received from Everest a $1.0 million milestone payment for each of these achievements.

In the fourth quarter of 2018, Eisai reported it provided Eurofarma Laboratórios S.A. the exclusive development and marketing rights for lorcaserin in Brazil and 17 other countries in Latin America and the Caribbean, including Mexico, and announced an appointment of Sun Pharma Laboratories Limited as a distributor of lorcaserin in India.

In the third quarter of 2018, Eisai provided two updates regarding BELVIQ: Eisai reported positive top line results from CAMELLIA-TIMI61, a long-term cardiovascular outcome trial; and Eisai reported it provided CY Biotech Company Ltd. the right to develop and commercialize in China, Hong Kong and Macau.

In April 2018, Outpost Medicine exercised its option to enter into a licensing agreement with us to advance an undisclosed, preclinical compound with potential utility in treating genitourinary disorders. We received an upfront fee comprised of cash and equity totaling $3.0 million and are eligible to receive $96.5 million in development and commercial milestone payments and up to low double-digit tiered royalties on annual net sales of the compound.

**Program development update.**

In January 2019, we announced positive data from the open-label extension results from the Phase 2 OASIS trial for etrasimod.

In October 2018, we announced positive data from a planned interim analysis of the ongoing open-label extension of the Phase 2 trial of ralinepag in development for the treatment of pulmonary arterial hypertension.

In September 2018, we announced positive topline results from our Phase 2a trial of olorinab in development for the treatment of pain associated with Crohn's disease.

In March 2018, we announced positive topline Phase 2 results from the OASIS trial for etrasimod.

**Other corporate events.**

In December 2018, our Board of Directors appointed Manmeet S. Soni to serve as a new independent director on our Board of Directors and in July 2018, our Board of Directors appointed Kieran T. Gallahue to serve as a new independent director on our Board of Directors.

In March 2018, we completed the sale of an aggregate of 9,775,000 shares of our common stock in an underwritten public offering. The Company's net proceeds from the offering were approximately $383.1 million after deducting underwriting discounts and commissions and offering expenses payable by us. We anticipate using the net proceeds from the offering for the clinical and preclinical development of drug candidates, for general corporate purposes, including working capital and costs associated with manufacturing services, and for capital expenditures.

In March 2018, we entered into an Asset Purchase Agreement, or Sale Agreement, with Siegfried Pharma AG and Siegfried AG (collectively and individually, Siegfried). Under the Sale Agreement, we agreed to sell and assign to Siegfried, and Siegfried agreed to purchase and assume from Arena GmbH, certain drug product finishing facility assets and know-how, including fixtures, equipment, other personal property and real estate assets located in Zofingen, Switzerland, related contracts and certain related liabilities, or collectively, the Manufacturing Operations. We refer to this transaction as the Siegfried Transaction. The Siegfried Transaction was completed on March 31, 2018. In connection with the Siegfried Transaction, all of Arena GmbH's approximately 50 employees transferred to Siegfried. We have excluded from our continuing operations for all periods presented in this report revenues and expenses associated with the disposed Manufacturing Operations, which are reported as discontinued operations. See Note 5 to our consolidated financial statements included in this Annual Report for additional information regarding the Manufacturing Operations.

In general, developing drugs and obtaining marketing approval is a long, uncertain and expensive process, and our ability to execute on our plans and achieve our goals depends on numerous factors, many of which we do not control. To date, we have generated limited revenues. We expect to continue to incur substantial net losses for at least the short term as we advance our clinical development programs, and support our collaborators.

See the above "Business" section for a more complete discussion of our business.

**RESULTS OF OPERATIONS**

We are providing the following summary of our revenues, research and development expenses and general and administrative expenses to supplement the more detailed discussion below. This summary excludes our revenues, research and development expenses and general and administrative expenses associated with our Manufacturing Operations, which are reported within income (loss) from discontinued operations. The dollar values in the following tables are in millions.

**Revenues**

| | Years ended December 31, | | | % change from | % change from |
|---|---|---|---|---|---|
| **Source of revenue** | **2018** | **2017** | **2016** | **2017 to 2018** | **2016 to 2017** |
| Other collaboration revenue | $ 11.4 | $ 19.6 | $ 92.2 | (41.9)% | * |
| Royalty revenue | 6.6 | 1.7 | — | * | * |
| Total revenues | $ 18.0 | $ 21.3 | $ 92.2 | (15.8)% | (76.8)% |

* The change is more than 100%.

**Research and development expenses**

| | Years ended December 31, | | | % change from | % change from |
|---|---|---|---|---|---|
| **Type of expense** | **2018** | **2017** | **2016** | **2017 to 2018** | **2016 to 2017** |
| External clinical and preclinical study fees | $ 69.7 | $ 43.4 | $ 29.5 | 60.8% | 47.2% |
| Salary and other personnel costs (excluding non-cash share-based compensation) | 28.4 | 15.9 | 17.2 | 78.7% | (7.5)% |
| Non-cash share-based compensation | 8.4 | 1.9 | 5.6 | * | (65.2)% |
| Facility and equipment costs | 5.2 | 5.3 | 8.0 | (1.7)% | (34.2)% |
| Other | 3.3 | 4.5 | 3.5 | (26.6)% | * |
| Total research and development expenses | $ 115.0 | $ 71.0 | $ 63.8 | 62.0% | 11.3% |

* The change is more than 100%.

**General and administrative expenses**

| | Years ended December 31, | | | % change from | % change from |
|---|---|---|---|---|---|
| **Type of expense** | **2018** | **2017** | **2016** | **2017 to 2018** | **2016 to 2017** |
| Legal, accounting and other professional fees | $ 16.9 | $ 8.7 | $ 8.3 | 94.6% | 3.6% |
| Salary and other personnel costs (excluding non-cash share-based compensation) | 13.3 | 9.6 | 9.2 | 38.4% | 5.0% |
| Non-cash share-based compensation | 11.2 | 5.9 | 4.4 | 88.3% | 33.2% |
| Facility and equipment costs | 4.5 | 4.7 | 4.3 | (4.3)% | 11.1% |
| Other | 1.8 | 1.4 | 1.3 | 33.3% | 8.0% |
| Total general and administrative expenses | $ 47.7 | $ 30.3 | $ 27.5 | 57.3% | 10.2% |

**YEAR ENDED DECEMBER 31, 2018, COMPARED TO YEAR ENDED DECEMBER 31, 2017**

**Revenues.** We recognized revenues of $18.0 million for the year ended December 31, 2018, compared to $21.3 million for the year ended December 31, 2017. This decrease was primarily due to decrease in upfront revenue from our collaboration agreements, partially offset by a $4.9 million increase in royalty revenues from Eisai, from $1.7 million in 2017 to $6.6 million in 2018.

Absent any new collaborations, we expect our 2019 revenues will primarily consist of (i) the upfront fee payment of $800.0 million we received in January 2019 pursuant to the United Therapeutics Agreement, (ii) royalty payments from Eisai based upon Eisai's sales of BELVIQ to its distributors, (iii) potential milestone payments from our current collaborators and (iv) reimbursements from collaborators for research funding.

Revenues from royalties based on sales of BELVIQ are difficult to predict, and our overall revenues will likely continue to vary from quarter to quarter and year to year. In the short term, we expect the amount of BELVIQ-related revenue we earn to fluctuate.

**Research and development expenses.** Research and development expenses, which account for the majority of our expenses, consist primarily of salaries and other personnel costs, clinical trial costs (including payments to contract research organizations, or CROs), preclinical study fees, manufacturing costs for non-commercial products, research supply costs and facility and equipment costs. We expense research and development costs as they are incurred when these expenditures have no alternative future uses. We generally do not track our earlier-stage, internal research and development expenses by project; rather, we track such expenses by the type of cost incurred.

Research and development expenses increased by $44.0 million to $115.0 million for the year ended December 31, 2018, from $71.0 million for the year ended December 31, 2017. This increase was primarily due to an increase of $26.3 million in external clinical and preclinical study fees, $12.5 million in salary and other personnel costs, and $6.5 million in non-cash share-based compensation expense.

We expect to incur substantial research and development expenses in 2019 and for the aggregate amount in 2019 to be potentially greater than the amount incurred in 2018. We expect our internal costs to be higher primarily due to increasing headcount and higher external clinical trial costs in connection with advancing the etrasimod and olorinab programs. Our actual expenses may be higher or lower than anticipated due to various factors, including our progress and results. For example, patient enrollment in our Phase 3 clinical program for etrasimod is expected to be competitive and challenging, and could take longer than originally projected, which may result in our related external expenses being lower in 2019 than anticipated (but which might increase the overall costs for completing this multi-year program).

Included in the $69.7 million of total external clinical and preclinical study fees noted in the table above in this section for the year ended December 31, 2018, were the following:

- $31.4 million related to ralinepag,
- $25.7 million related to etrasimod, and
- $3.9 million related to olorinab.

Included in the $43.4 million of total external clinical and preclinical study fees noted in the table above in this section for the year ended December 31, 2017, were the following:

- $28.7 million related to etrasimod,
- $9.7 million related to ralinepag, and
- $2.8 million related to olorinab.

Cumulatively from our inception through December 31, 2018, we have recognized (i) external clinical and preclinical study fees of $307.8 million for lorcaserin, $88.0 million for etrasimod, $62.2 million for ralinepag, $43.8 million for nelotanserin and $14.2 million for olorinab and (ii) $53.2 million for non-commercial manufacturing and other development costs for lorcaserin and, to a lesser extent, nelotanserin.

While expenditures on current and future clinical development programs are expected to be substantial, they are subject to many uncertainties, including whether we have adequate funds and develop our drug candidates with one or more collaborators or independently. As a result of such uncertainties, we cannot predict with any significant degree of certainty the duration and completion costs of our research and development projects or whether, when and to what extent we will generate revenues from the commercialization and sale of any of our drug candidates. The duration and cost of clinical trials may vary significantly over the life of a project as a result of unanticipated events arising during clinical development and a variety of factors, including:

- the nature and number of trials and studies in a clinical program;
- the potential therapeutic indication;
- the number of patients who participate in the trials;

- the number and location of sites included in the trials;
- the rates of patient recruitment, enrollment and withdrawal;
- the duration of patient treatment and follow-up;
- the costs of manufacturing drug candidates; and
- the costs, requirements, timing of, and the ability to secure and maintain regulatory approvals.

**General and administrative expenses.** General and administrative expenses increased by $17.4 million to $47.7 million for the year ended December 31, 2018, from $30.3 million for the year ended December 31, 2017. This increase was primarily due to increases of $8.2 million in legal, accounting and other professional fees, $5.3 million in non-cash share-based compensation expenses, and an increase of $3.7 million in salary and other personnel costs. The increases in compensation costs are primarily due to an increase in the number of general and administrative employees. We expect that our 2019 general and administrative expenses will be higher than in 2018.

**Interest and other income (expense), net.** Interest and other income, net, was $5.9 million for the year ended December 31, 2018, compared to interest and other expense, net of $3.9 million for the year ended December 31, 2017. This change was primarily due to an increase of $8.3 million in interest income from our available-for-sale investments activity, an increase of $1.0 million in rental income from sublease activity in 2018, and a decrease of $0.4 million in interest expense.

**Income tax benefit.** Income tax benefit was $110.3 million for the year ended December 31, 2018, primarily related to the partial release of a valuation allowance on our deferred tax assets.

**Discontinued operations.** On March 31, 2018, Arena GmbH sold the Manufacturing Operations via the Siegfried Transaction. As a result of the Siegfried Transaction, we have excluded from our continuing operations for all periods presented in this report revenues and expenses associated with the disposed Manufacturing Operations, which are reported as discontinued operations. As a result of the Siegfried Transaction, we have excluded from our continuing operations for all periods presented in this report revenues and expenses associated with our manufacturing operations that were divested, or Manufacturing Operations, which are reported as discontinued operations. For the year ended December 31, 2018, loss from discontinued operations was $0.8 million. For the year ended December 31, 2017, income from discontinued operations was $3.1 million. See Note 5 to our consolidated financial statements included in this Annual Report for additional information regarding the Manufacturing Operations.

**YEAR ENDED DECEMBER 31, 2017, COMPARED TO YEAR ENDED DECEMBER 31, 2016**

**Revenues.** In December 2016, we amended and restated the terms of the marketing and supply agreement for lorcaserin with Eisai by entering into a new Transaction Agreement and a new Supply Agreement (collectively, the Eisai Agreement) with Eisai. Under the Eisai Agreement, Eisai acquired global commercialization and manufacturing rights to lorcaserin, including in the territories retained by us under the prior agreement, with control over global development and commercialization decisions. Eisai is responsible for all lorcaserin development expenses going forward. We also assigned to Eisai our rights under the commercial lorcaserin distribution agreements with Ildong Pharmaceutical Co., Ltd., or Ildong, for South Korea; CY Biotech Company Limited, or CYB, for Taiwan; and Teva Pharmaceuticals Ltd.'s Israeli subsidiary, Abic Marketing Limited, or Teva, for Israel.

Prior to the Eisai Agreement, we received from Eisai, Ildong, CYB and Teva total upfront payments of $122.5 million. Revenues from these upfront payments were previously deferred, as we determined that the exclusive rights did not have standalone value without our ongoing development and regulatory activities. Accordingly, these payments were recognized ratably as revenue over the periods in which we expected the services to be rendered. The Eisai Agreement eliminated our obligation to continue performing the development and regulatory activities required in the prior agreements. Therefore, on December 28, 2016, $64.0 million of deferred revenues from these upfront payments was allocated to the rights delivered by us to Eisai pursuant to the Eisai Agreement and recognized as revenue in 2016.

We recognized revenues of $21.3 million for the year ended December 31, 2017, compared to $92.2 million for the year ended December 31, 2016. This decrease was primarily due to $66.0 million of revenue recorded in 2016 from upfront payments for lorcaserin collaborations received from Eisai in prior years, and $5.7 million of revenue recorded in 2016 from upfront payments for other lorcaserin collaborations received from Ildong and CYB in prior years with no similar revenue in 2017 and a total of $12.3 million of milestones from Eisai and Ildong that we earned during 2016 primarily from the approval of the once-daily formulation of lorcaserin in the United States (branded as BELVIQ XR), the approval of the twice-daily formulation of lorcaserin in Mexico (branded as VENESPRI), and the approval of BELVIQ in Brazil. These decreases were partially offset by $12.0 million revenue in 2017 related to an upfront payment pursuant to a collaboration agreement with Everest entered into in December 2017 and $1.7 million of royalty revenue recorded in 2017 under the Eisai Agreement.

**Research and development expenses.** Research and development expenses increased by $7.2 million to $71.0 million for the year ended December 31, 2017, from $63.8 million for the year ended December 31, 2016. This increase was primarily due to an increase of $13.9 million in external clinical and preclinical study fees and internal non-commercial manufacturing costs partially offset by decreases of $3.7 million in non-cash, share-based compensation expense, $2.7 million in facility and equipment costs, $1.5 million in research supply costs and $1.3 million in salary and other personnel costs, primarily due to the workforce reductions in 2016.

Included in the $43.4 million of total external clinical and preclinical study fees and internal non-commercial manufacturing costs noted in the table above in this section for the year ended December 31, 2017, were the following:

- $28.7 million related to etrasimod,
- $9.7 million related to ralinepag, and
- $2.8 million related to olorinab.

Included in the $29.5 million of total external clinical and preclinical study fees and internal non-commercial manufacturing costs noted in the table above in this section for the year ended December 31, 2016, were the following:

- $17.6 million related to etrasimod,
- $4.7 million related to ralinepag,
- $4.2 million related to lorcaserin, and
- $1.1 million related to olorinab.

**General and administrative expenses.** General and administrative expenses increased by $2.8 million to $30.3 million for the year ended December 31, 2017, from $27.5 million for the year ended December 31, 2016. This increase was primarily due to increases of $1.5 million in non-cash, share-based compensation expense, and $0.4 million in salary and other personnel costs, both primarily due to the increase in hiring activity in the latter half of 2017, an increase of $0.4 million in facility and equipment costs, and an increase of $0.4 million in legal, accounting and other professional fees.

**Litigation settlement expense, net.** Litigation settlement expense, net was $11.975 million for the year ended December 31, 2017. This expense related to a stipulation and agreement of settlement we entered into in November 2017 in connection with a stockholder class action. The accrued amount represents the allocated value of the settlement that we will pay either in shares of our common stock or in cash, at our election. This amount was settled during the second quarter of 2018.

**Restructuring charges.** We recognized $6.1 million of restructuring charges for the year ended December 31, 2016, in connection with employee termination costs, including severance and other benefits, related to the reduction of our US workforce in 2016. We incurred no similar charges in 2017.

**Interest and other expense, net.** Interest and other expense, net, decreased by $3.1 million to $3.9 million for the year ended December 31, 2017, from $7.0 million for the year ended December 31, 2016. This decrease was primarily due to (i) $0.4 million in gain on sale and disposal of equipment for the year ended December 31, 2017, compared to $1.3 million in net loss on sale and disposal of equipment for the year ended December 31, 2016, (ii) an increase of $1.0 million in rental income from additional sublease activity in 2017, and (iii) a decrease of $0.4 million in interest expense.

**Discontinued operations.** For the year ended December 31, 2017, income from discontinued operations was $3.1 million. For the year ended December 31, 2016, loss from discontinued operations was $10.6 million. See Note 5 to our consolidated financial statements included in this Annual Report for additional information regarding the Manufacturing Operations.

## LIQUIDITY AND CAPITAL RESOURCES

We have accumulated a large deficit since inception that has primarily resulted from the significant research and development expenditures we have made in seeking to identify and develop compounds that could become marketed drugs. We expect to continue to incur substantial losses for at least the short term.

To date, we have obtained cash and funded our operations to date primarily through the sale of common and preferred stock, the issuance of debt and related financial instruments, payments from collaborators and customers and sale leaseback transactions. From our inception through December 31, 2018, we have generated $2.7 billion in cash from these sources, of which approximately $2.0 billion was through sales of equity, $577.4 million was through payments from collaborators and customers, $96.9 million was through the issuance of debt and related financial instruments and $77.1 million was from sale and leaseback transactions.

We believe our cash resources are sufficient to allow us to continue operations for at least the next 12 months from the date this Annual Report is filed with the SEC. There is no guarantee that adequate funds will be available when needed from additional debt or equity financing, development and commercialization partnerships or from other sources, or on terms acceptable to us. If our efforts to obtain sufficient additional funds are not successful, we would be required to delay, scale back, or eliminate some or all of our research or development, manufacturing operations, administrative operations, and clinical or regulatory activities, which could negatively affect our ability to achieve certain corporate goals.

**Short term liquidity.**

At December 31, 2018, we had $528.0 million in cash and cash equivalents, and available-for-sale investments. In January 2019, we received an $800.0 million upfront payment from United Therapeutics. In addition to payments expected from Eisai for royalties, our other potential sources of liquidity in the short term include (i) milestone and other payments from collaborators, (ii) entering into new collaboration, licensing or commercial agreements for one or more of our drug candidates or programs, (iii) the sale or lease of our facilities or other assets and (iv) sale of equity, issuance of debt or other transactions.

**Long term liquidity.**

It will require substantial cash to achieve our objectives of discovering, developing and commercializing drugs, and this process typically takes many years and potentially several hundreds of millions of dollars for an individual drug. We may not have adequate available cash, or assets that could be readily turned into cash, to meet these objectives in the long term. We will need to obtain significant funds under our existing collaborations, under new collaboration, licensing or other commercial agreements for one or more of our drug candidates and programs or patent portfolios, or from other potential sources of liquidity, which may include the sale of equity, issuance of debt or other transactions.

In addition to potential payments from our current collaborators, as well as funds from public and private financial markets, potential sources of liquidity in the long term include (i) upfront, milestone, royalty and other payments from any future collaborators or licensees and (ii) revenues from sales of any drugs we obtain regulatory approval to commercialize on our own. The length of time that our current cash and cash equivalents and any available borrowings will sustain our operations will be based on, among other things, the rate of adoption and commercial success of any drugs we or our collaborators obtain regulatory approval to market, regulatory decisions affecting our and our collaborator's drug candidates, prioritization decisions regarding funding for our programs, progress in our clinical and earlier-stage programs, the time and costs related to current and future clinical trials and nonclinical studies, our research, development, manufacturing and commercialization costs (including personnel costs), our progress in any programs under collaborations, costs associated with intellectual property, our capital expenditures, and costs associated with securing any in-licensing opportunities. Any significant shortfall in funding may result in us reducing our development and/or research activities, which, in turn, would affect our development pipeline and ability to obtain cash in the future.

We evaluate from time to time potential acquisitions, in-licensing and other opportunities. Any such transaction may impact our liquidity as well as affect our expenses if, for example, our operating expenses increase as a result of such acquisition or license or we use our cash to finance the acquisition or license.

**Sources and uses of our cash.**

Net cash used in operating activities increased by $65.6 million to $132.2 million in the year ended December 31, 2018, compared to $66.6 million in the year ended December 31, 2017. This increase was primarily due to (i) an increase of $22.0 million in payments made for external clinical study fees, (ii) an increase in cash expenditures of approximately $13.7 million for personnel costs resulting primarily from an increase in the number of employees, (iii) a class action litigation settlement payment of $12.0 million in the second quarter of 2018, (iv) a decrease of $10.0 million in payments we received from our collaboration agreements, and (v) a decrease of $7.1 million in net payments we received from Eisai.

Net cash used in operating activities increased by $4.5 million to $66.6 million in the year ended December 31, 2017, compared to $62.1 million in the year ended December 31, 2016. This increase was primarily due to (i) an increase of $13.7 million in payments made for external clinical study fees, (ii) the $10.0 million payment we received from Eisai in December 2016 in connection of the sale of bulk inventory under the Eisai Agreement, while we did not receive any similar payment in the year ended December 31, 2017, and (iii) the $7.5 million payment we received from Boehringer Ingelheim in February 2016 upon entering into the Boehringer Ingelheim Agreement. These increases in net cash used in operating activities were partially offset by (i) the $12.0 million we received from Everest in December 2017 upon entering into the collaboration agreement with Everest, (ii) an increase of $5.9 million in net payments we received from Eisai and other BELVIQ distributors, from $9.3 million in the year ended December 31, 2016, to $15.2 million (primarily consisting of $7.2 million of manufacturing support payments related to the Eisai Agreement and $5.2 million in net settlement payments related to the prior agreements) in the year ended December 31, 2017, and (iii) decreased cash expenditures of approximately $10.7 million for personnel costs primarily resulting from the workforce reductions payments in 2016.

Net cash used in investing activities increased by $138.9 million to $251.3 million in the year ended December 31, 2018, compared to $112.4 million in the year ended December 31, 2017. This increase was primarily due to $254.0 million in net purchases of available-for-sale investments, net of proceeds from the sales and maturity of available-for-sale investments in the year ended December 31, 2018, compared to $112.6 million in purchases of available-for-sale investments in the year ended December 31, 2017.

Net cash used in investing activities increased by $111.6 million to $112.4 million in the year ended December 31, 2017, compared to $0.8 million in the year ended December 31, 2016. This increase was primarily due to $112.6 million in net purchases of available-for-sale investments in the year ended December 31, 2017, while there was no similar investing activity in the year ended December 31, 2016.

Net cash of $385.0 million was provided by financing activities in the year ended December 31, 2018, as a result of net proceeds of $383.1 million from our March 2018 offering of our common stock and net proceeds of $5.9 million from stock option exercises, partially offset by $4.0 million of principal payments on our lease financing obligations. Net cash of $245.3 million was provided by financing activities in the year ended December 31, 2017, as a result of net proceeds of $236.4 million from our April 2017 and July 2017 offerings of our common stock, net proceeds of $7.0 million from the sale of our common stock under our ATM facility and net proceeds of $5.4 million from stock option exercises, partially offset by $3.5 million of principal payments on our lease financing obligations. Net cash of $2.3 million was used in financing activities in the year ended December 31, 2016, as a result of $3.0 million of principal payments on our lease financing obligations, partially offset by net proceeds of $0.4 million from stock option exercises and purchases under our employee stock purchase plan and a $0.3 million security deposit received from a sublessee.

**Contractual Obligations**

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

| | Payments due by period | | | | |
|---|---|---|---|---|---|
| **Contractual Obligations** | **Total** | **Less than 1 year** | **1-3 years** | **3-5 years** | **More than 5 years** |
| Financing obligations | $ 73,719 | $ 7,391 | $ 16,715 | $ 17,561 | $ 32,052 |
| Operating leases | 8,849 | 1,050 | 2,076 | 2,025 | 3,698 |
| Total | $ 82,568 | $ 8,441 | $ 18,791 | $ 19,586 | $ 35,750 |

Our financing obligations relate to sale and leaseback transactions for certain of our properties. We have applied the financing method to these sale and leaseback transactions, which requires that the book value of the properties and related accumulated depreciation remain on our balance sheet with no sale recognized. The sales price of the properties is recorded as a financing obligation and a portion of each lease payment is recorded as interest expense. At December 31, 2018, we expect our interest expense over the remaining term of these leases to total $26.0 million. Other of our properties are under operating leases and are included under operating leases above.

**Off-balance sheet arrangements.**

We do not have and did not have at December 31, 2018, any off-balance sheet arrangements that have or are reasonably likely to have a current or future material effect on our financial condition, results of operations, liquidity, capital expenditures or capital resources.

**COLLABORATIONS AND LICENSE AGREEMENTS**

**Everest.**

In December 2017, we and Everest entered into an exclusive agreement, or the Everest Agreement, to conduct joint development for the ralinepag and etrasimod programs. Under the Everest Agreement, we granted Everest an exclusive, royalty-bearing license to develop and commercialize ralinepag (in any formulation) and etrasimod (in oral formulations), in mainland China, Taiwan, Hong Kong, Macau and South Korea, or collectively, the Territories. Everest is generally responsible for development and commercialization of the licensed products in the Territories and may participate in the portion of our global clinical trials that is conducted in the Territories. In January 2019, we and Everest amended the Everest Agreement by entering into two separate agreements, one for each development program with the terms identical to the original Everest Agreement. Under the United Therapeutics Agreement described in Note 1 to our consolidated financial statements included in this Annual Report, we assigned all our rights and obligations with respect to the ralinepag program under the Everest Agreement, to United Therapeutics.

In connection with entering into the Everest Agreement, we received from Everest an upfront payment of $12.0 million in December 2017. We are also eligible to receive up to an aggregate of $115.0 million in success milestones in case of full commercial success of etrasimod products. We are also eligible to receive tiered royalties on net sales of etrasimod products in the Territories.

The promised goods and services under the Everest Agreement are accounted for as a single performance obligation consisting of a development and commercialization license. The amount of the upfront payment was recognized as revenue in December 2017 as we determined (i) that the license is a deliverable with standalone value to Everest and (ii) the upfront payment represents consideration to be allocated to the delivered license. In the fourth quarter of 2018, the Chinese National Medical Products Administration accepted the initial clinical trial applications for etrasimod and the oral formulation of ralinepag. Under the terms of the Everest Agreement, we recognized revenue of $2.0 million from the achievement of these milestones. As of December 31, 2018, all future potential milestone payments were excluded from the estimated total transaction price as they are considered constrained.

**Eisai.**

In July 2010, we granted Eisai exclusive commercialization rights for lorcaserin (marketed as BELVIQ/BELVIQ XR) solely in the United States and its territories and possessions. In May 2012, we and Eisai entered into the first amended and restated agreement, which expanded Eisai's exclusive commercialization rights to include most of North and South America. In November 2013, we and Eisai entered into the second amended and restated agreement, or Second Amended Agreement, which expanded Eisai's exclusive commercialization rights for lorcaserin to all countries in the world, except for South Korea, Taiwan, Australia, New Zealand and Israel.

In December 2016, we and Eisai amended and restated the terms of marketing and supply agreement for lorcaserin with Eisai by entering into a Transaction Agreement and a Supply Agreement (collectively, the Eisai Agreement) with Eisai. Under the Transaction Agreement, Eisai acquired an exclusive royalty-bearing license or transfer of intellectual property to global commercialization and manufacturing rights to lorcaserin, including in the territories retained by us under the prior agreement, with control over global development and commercialization decisions. Eisai is responsible for all lorcaserin development expenses in the future. We also assigned to Eisai our rights under the commercial lorcaserin distribution agreements with Ildong Pharmaceutical Co., Ltd., or Ildong, for South Korea; CY Biotech Company Limited, or CYB, for Taiwan; and Teva Pharmaceuticals Ltd.'s Israeli subsidiary, Abic Marketing Limited, or Teva, for Israel.

Under the Supply Agreement, Eisai paid us $10.0 million in December 2016 to acquire our entire on-hand inventory of bulk lorcaserin and the precursor material for manufacturing lorcaserin. Eisai also paid us for finished drug product plus monthly manufacturing support payments through March 2018 totaling CHF 8.7 million.

Until March 31, 2018, when we sold the Manufacturing Operations, including the assignment of the Supply Agreement, to Siegfried (see Note 5), we manufactured lorcaserin at our manufacturing facility in Zofingen, Switzerland. Revenues earned for (i) lorcaserin sold by us to Eisai under the manufacturing and supply commitment within the Supply Agreement and (ii) the manufacturing support payments are classified within discontinued operations as part of the Manufacturing Operations in the consolidated statements of operations (see Note 5). All other revenues earned under the Transaction Agreement, such as royalties, are classified within continuing operations in the consolidated statements of operations.

*Royalty payments.*

Pursuant to the Transaction Agreement, we are eligible to receive royalty payments from Eisai based on the global net sales of lorcaserin. The royalty rates are as follows:

- 9.5% on annual net sales less than or equal to $175.0 million

- 13.5% on annual net sales greater than $175.0 million but less than or equal to $500.0 million
- 18.5% of annual net sales greater than $500.0 million

*Upfront payments.*

Prior to the Transaction Agreement, we received from Eisai total upfront payments of $115.0 million under prior lorcaserin collaboration agreements and $7.5 million from the prior commercial lorcaserin distribution agreements with Ildong and CYB described below, and Teva. Revenues from these upfront payments were previously deferred, as we determined that the exclusive rights did not have standalone value without our ongoing development and regulatory activities. Accordingly, these payments were recognized ratably as revenue over the periods in which we expected the services to be rendered. The Transaction Agreement effectively eliminated our obligation to continue performing the development and regulatory activities required in the original agreement, which resulted in acceleration of upfront payment revenue recognition in 2016. For the year ended December 31, 2016, we recognized revenue of $66.0 million related to these upfront payments.

*Milestone payments.*

For the year ended December 31, 2016, we recognized revenue of $12.0 million related to the following milestone payments from our Second Amended Agreement with Eisai.

In July 2016, the US Food and Drug Administration, or FDA, approved the New Drug Application for BELVIQ XR. We earned from Eisai a $10.0 million substantive milestone payment from this achievement. In October 2016, Eisai announced the commercial launch of BELVIQ XR in the United States.

In July 2016, the Federal Commission for the Protection Against Sanitary Risk approved the Marketing Authorization Application in Mexico for our twice-daily formulation of lorcaserin for chronic weight management. We earned from Eisai a $1.0 million substantive milestone payment from this achievement.

In December 2016, the Brazilian Health Surveillance Agency provided regulatory approval in Brazil for BELVIQ. We earned from Eisai a $1.0 million substantive milestone payment from this achievement.

In total, prior to the Transaction Agreement, we received a total of $102.1 million in milestone payments from Eisai, Ildong, CYB, and Teva. These payments were recognized as revenue upon the achievement of the milestones. We are eligible to receive an additional substantive commercial milestone of $25.0 million upon the achievement of global net sales of lorcaserin for a calendar year first exceeding $250.0 million.

*Accounting for Eisai Agreement under ASC 606.*

Upon implementation of ASC 606 on January 1, 2018, we applied a practical expedient for contract modifications applicable to contracts that were modified before the implementation date. The promised goods and services under the Eisai Agreement were assessed in combination with promised goods and services under our previous agreements with Eisai and commercial lorcaserin distribution agreements with Ildong, CYB, and Teva. The total estimated transaction price of these contracts at the implementation date was $344.4 million, which included previously received upfront payments, milestone payments, proceeds from net products sales, reimbursement of development expenses, reimbursement of patent expenses, manufacturing support payments received and expected to be received under the Supply Agreement, proceeds from the sale of on-hand inventory of bulk lorcaserin and the precursor material, royalty payments received through December 31, 2017, and estimated future royalty payments related to intellectual property sold to Eisai. The future potential milestone payments were excluded from the estimated total transaction price as they are considered constrained due to our assessment of the probability of a significant revenue reversal. The future royalties related to licensed intellectual property were excluded from the estimated total transaction price under the royalty exception in ASC 606. The estimated future royalties that relate to intellectual property sold to Eisai do not qualify for the royalty exception in ASC 606 and were included in the estimated total transaction price.

The estimated total transaction price was allocated between satisfied and unsatisfied performance obligations based on the relative standalone selling prices of the identified performance obligations. The remaining manufacturing and supply obligations under the Supply Agreement was the only unsatisfied performance obligation. As a result of this allocation, on January 1, 2018, we reduced the balance of deferred revenues associated with the Eisai Agreement at the implementation date by $25.5 million, recognized a contract asset of $6.1 million related to future manufacturing support payments under the Supply Agreement and recognized a contract asset of $4.1 million related to estimated future royalty payments from intellectual property sold to Eisai under the Transaction Agreement. In connection with the sale of the Manufacturing Operations on March 31, 2018, we derecognized the remaining portion

of the contract asset associated with the Supply Agreement. During 2018, we adjusted our estimate of future royalty payments from intellectual property sold to Eisai under the Transaction Agreement based on the positive CVOT study results reported by Eisai and our estimate of the qualifying sales of BELVIQ in the future years and recorded associated royalty revenue and an increase to the contract asset of $3.3 million.

Based on the bill-and-hold accounting guidance in ASC 606, effective January 1, 2018, we derecognized $3.6 million of inventory of bulk lorcaserin and the precursor material previously sold to Eisai for which the revenue recognition criteria were met on the implementation date under ASC 606.

For the years ended December 31, 2018 and 2017, we recorded royalty revenue of $6.6 million and $1.7 million, respectively related to the Transaction Agreement. For the year ended December 31, 2018 and 2017, we recognized revenue of $1.5 million and $15.9 million, respectively, related to the Supply Agreement (classified under discontinued operations), all of which was recorded during the first quarter of 2018 and primarily consisting of net product sales and other collaboration revenue.

*Accounting for Eisai Agreement under previous revenue recognition policy.*

The total arrangement consideration of $115.6 million primarily consists of (i) the December 28, 2016, balances of deferred revenues from the upfront payments received under the prior Eisai agreements and the distribution agreements with Ildong, CYB and Teva; (ii) the $10.0 million payment received from Eisai on December 28, 2016; and (iii) the product purchase payments and manufacturing support payments we expect to receive from Eisai for the initial two-year manufacturing and supply commitment period.

All of the deliverables were determined to have standalone value and to meet the criteria to be accounted for as separate units of accounting. Factors considered in the determination included, among other things, for the license, the manufacturing experience and capabilities of Eisai and their sublicense rights, and for the remaining deliverables the fact that they are not proprietary and can be provided by other vendors. The total arrangement consideration was allocated to the units of accounting on the basis of their relative estimated selling prices as follows:

- $64.0 million was allocated to the License Deliverable. As the License Deliverable was delivered on December 28, 2016, this amount was recognized as collaboration revenue of continuing operations for the year ended December 31, 2016.
- $30.8 million was allocated to the Inventory Deliverable. Title to this entire inventory passed to Eisai on December 28, 2016. However, none of this inventory was physically transferred from the manufacturing facility on that date. There is no fixed schedule for delivery given a portion has been and will be delivered on a continuous basis as we perform under the manufacturing commitment, another portion has been and will be physically transferred to Eisai upon request by Eisai and the rest is expected to be physically transferred at the end of the manufacturing and supply commitment period. Also, the risks of ownership for this inventory did not pass to Eisai in 2016 as we have financial responsibility for loss, damage or destruction which occurs while in our possession. Therefore, none of the arrangement consideration allocated to this deliverable was recognized as revenue and none of the carrying value of this inventory was recognized as cost of product sales for the year ended December 31, 2016. For the year ended December 31, 2017, we recognized $6.4 million as revenue of discontinued operations related to this deliverable and $0.9 million of the carrying value of this inventory as cost of product sales of discontinued operations.
- $20.8 million was allocated to the Manufacturing and Supply Commitment Deliverable. This deliverable was provided over 2017 and 2018 as product was shipped to Eisai until March 31, 2018. Therefore, none of the arrangement consideration allocated to this deliverable was recognized as revenue for the year ended December 31, 2016. For the year ended December 31, 2017, we recognized $9.5 million as revenue of discontinued operations related to this deliverable.

The estimated selling price represents the price at which we would contract if the deliverable was sold regularly on a standalone basis. The estimated selling price for each unit of accounting was determined as follows:

- The estimated selling price for the License Deliverable was determined using an income approach that estimates the net present value of royalties Eisai is expected to earn under the Eisai Agreement as compared to the Second Amended Agreement, net of the development costs we are no longer obligated to spend. This model includes several assumptions, including the potential market for lorcaserin in each relevant jurisdiction, probabilities of obtaining regulatory approval in additional jurisdictions, the impact of competition, the potential impact of Eisai's ongoing development and regulatory activities related to lorcaserin, and the appropriate discount rate.
- The estimated selling price for the Inventory Deliverable was determined by considering the historical cost of the precursor materials, adjusted for any changes in market condition and supplier relationships. We believe that the Eisai Agreement pricing represents pricing that would be charged if it were sold on a standalone basis.

- The estimated selling price for the Manufacturing and Supply Commitment Deliverable was determined to be the aggregate product purchase payments we expect to receive from Eisai for the initial two-year manufacturing and supply commitment period. As noted above, we believe that the Eisai Agreement pricing represents pricing that would be charged if it were sold on a standalone basis.

In the consolidated balance sheet at December 31, 2017, the deferred revenues of $25.5 million relating to the Eisai Agreement (primarily comprised of the deferred portion of the previously received upfront payments and the $10.0 million payment received from Eisai in December 2016) were classified as liabilities of disposal group held for sale.

Prior to December 2016, we deferred recognition of revenue and the related cost at the time we sold lorcaserin to Eisai because we did not have the ability to estimate the amount of product that could have been returned to us and thus recognized revenues and the related costs from net product sales when Eisai shipped BELVIQ to its distributors. Pursuant to the Transaction Agreement, we determined that we achieved the ability to reasonably estimate the amount of product returns and recognize revenue and the related cost from product sales when we ship BELVIQ to Eisai. On December 28, 2016, we recognized revenues of $6.7 million and costs of $1.9 million on net product sales which had been previously deferred, which is a component of discontinued operations in the consolidated statement of operations.

*Development payments.*

As part of the US approval of BELVIQ, the FDA, is requiring the evaluation of the effect of long-term treatment with BELVIQ on the incidence of major adverse cardiovascular events, or MACE, in overweight and obese patients with cardiovascular disease or multiple cardiovascular risk factors (which is the FDA-required portion of the cardiovascular outcomes trial), as well as the conduct of postmarketing studies to assess the safety and efficacy of BELVIQ for weight management in obese pediatric and adolescent patients. Under the Second Amended Agreement, Eisai and we were responsible for 90% and 10%, respectively, of the cost for the FDA-required portion of the cardiovascular outcomes trial, or CVOT, 50% and 50%, respectively, of the non-FDA portion of the studies and we were also obligated to share the cost of FDA-required studies in obese pediatric patients and for additional clinical studies in other territories.

Under the Eisai Agreement, Eisai is solely responsible for all costs and expenses in connection with further development of lorcaserin from and after July 1, 2016, and we were relieved of any obligations under the Second Amended Agreement to pay our share of future development costs of lorcaserin. Accordingly, on December 28, 2016, we recorded a reduction of research and development expenses which would have been otherwise due to Eisai under the Second Amended Agreement of $3.7 million for the period from July 1, 2016, through December 28, 2016.

For the year ended December 31, 2016, we recognized expenses of $4.2 million for external clinical study fees related to lorcaserin, which are included in continuing operations. There were no such expenses in 2018 and 2017. Additionally, for the years ended December 31, 2017, and 2016, we recognized expenses of $1.4 million, and $3.1 million, respectively for internal non-commercial manufacturing costs primarily related to lorcaserin, which are included in discontinued operations.

**Ildong Pharmaceutical Co., Ltd.**

In November 2012, we and Ildong entered into the Marketing and Supply Agreement, or Ildong Agreement. Under this agreement, we granted Ildong exclusive rights to commercialize BELVIQ in South Korea for weight loss or weight management in obese and overweight patients. We also provided certain services and manufacture and sold BELVIQ to Ildong. As noted above, the Ildong Agreement was assigned to Eisai pursuant to the Transaction Agreement with Eisai on December 28, 2016.

In connection with entering into the Ildong Agreement, we received from Ildong an upfront payment of $5.0 million, less withholding taxes. Revenues from this upfront payment were deferred, as we determined that the exclusive rights did not have standalone value without our ongoing development and regulatory activities. Accordingly, this payment was recognized ratably as revenue over the period in which we expected the services to be rendered. The assignment of the Ildong Agreement pursuant to the Transaction Agreement with Eisai effectively eliminated our obligation to continue performing the development and regulatory activities required in the Ildong Agreement. Therefore, on December 28, 2016, the $3.5 million of deferred revenues from this upfront payment was allocated to the value of the License provided to Eisai and recognized as revenue in 2016.

Under the Ildong Agreement, we manufactured BELVIQ at our facility in Zofingen, Switzerland, and sold BELVIQ to Ildong for a purchase price starting at the higher of the defined minimum amount or 35% of Ildong's annual net product sales (which are the gross invoiced sales less certain deductions described in the Ildong Agreement), or the Ildong Product Purchase Price. The Ildong Product Purchase Price increased on a tiered basis up to the higher of the defined minimum amount or 45% on the portion of annual net product sales exceeding $15.0 million. Since the inception of commercial sales of BELVIQ in South Korea in 2015, the Ildong

Product Purchase Price equaled the defined minimum amount (which exceeded the amounts calculated using the applicable percentages for the applicable tiers of Ildong's annual net product sales).

Prior to December 2016, we deferred recognition of revenue and the related cost at the time we sold BELVIQ to Ildong because we did not have the ability to estimate the amount of product that could have been returned to us and thus recognized revenues and the related costs from net product sales when Ildong shipped BELVIQ to its distributors. In December 2016, we determined that we achieved the ability to reasonably estimate product returns under the Ildong Agreement. Accordingly, we recognized revenues of $2.0 million and costs of $0.7 million in December 2016 on net product sales which had been previously deferred, of which is a component of discontinued operations in the consolidated statement of operations.

For the year ended December 31, 2016, we recognized revenues of $11.4 million under the Ildong agreement, of which $7.2 million is included in discontinued operations. No revenues were recognized during the years ended December 31, 2018 and 2017, under this agreement as a result of the assignment of our rights under the Ildong Agreement to Eisai.

**CY Biotech Company Limited.**

In July 2013, we entered into the CYB Agreement. Under this agreement, we granted CYB exclusive rights to commercialize BELVIQ in Taiwan for weight loss or weight management in obese and overweight patients, subject to regulatory approval of BELVIQ by the Taiwan Food and Drug Administration, or TFDA. The CYB Agreement provided for us to perform certain services and to manufacture and sell BELVIQ to CYB. As noted above, the CYB Agreement was assigned to Eisai pursuant to the Transaction Agreement with Eisai on December 28, 2016.

In connection with entering into the CYB agreement, we received from CYB an upfront payment of $2.0 million, less withholding taxes. Revenues from this upfront payment were deferred, as we determined that the exclusive rights did not have standalone value without our ongoing development and regulatory activities. Accordingly, this payment was recognized ratably as revenue over the period in which we expected the services to be rendered. The assignment of the CYB Agreement pursuant to the Eisai Agreement effectively eliminated our obligation to continue performing the development and regulatory activities required in the CYB Agreement. Therefore, on December 28, 2016, the $1.7 million of deferred revenues from this upfront payment was allocated to the value of the License provided to Eisai and recognized as revenue in 2016.

For the year ended December 31, 2016, we recognized revenues of $1.8 million under this agreement. No revenues were recognized during the years ended December 31, 2018 and 2017, under this agreement as a result of the assignment of our rights under the CYB Agreement to Eisai.

**Boehringer Ingelheim International GmbH.**

In December 2015, we and Boehringer Ingelheim entered into an collaboration and license agreement, or Boehringer Ingelheim Agreement, under which we and Boehringer Ingelheim conduct joint research to identify drug candidates targeting an undisclosed G protein-coupled receptor, or GPCR, that belongs to the group of orphan central nervous system, or CNS, receptors. Under Boehringer Ingelheim Agreement, we granted Boehringer Ingelheim exclusive rights to our internally discovered, novel compounds and intellectual property for an orphan CNS receptor. The Boehringer Ingelheim Agreement was in effect through January 2018. We and Boehringer Ingelheim agreed to extend the original term of the Boehringer Ingelheim Agreement by twelve months through January 2019 and by additional six months through July 2019. The agreement grants Boehringer Ingelheim exclusive worldwide rights to develop, manufacture and commercialize products resulting from the collaboration.

In part consideration of the exclusive rights to our intellectual property necessary or useful to conduct the joint research under the Boehringer Ingelheim Agreement, we received from Boehringer Ingelheim an upfront payment of $7.5 million in 2016.

In December 2018, we earned a milestone payment of $3.5 million upon Boehringer Ingelheim's start of preclinical development.

We are also eligible to receive up to an aggregate of $247.5 million (of which the first $8.5 million is payable to Beacon) in success milestone payments in case of full commercial success of multiple drug products.

The promised goods and services under the Boehringer Ingelheim Agreement are accounted for as a single combined performance obligation consisting of a research license, a development and commercialization license and research services. Our performance obligation under the original term of the Boehringer Ingelheim Agreement was fully satisfied as of January 2018, and accordingly the estimated total transaction price of the Boehringer Ingelheim Agreement under the original contractual term of $10.5 million was fully recognized as revenue over the period from January 2016 through January 2018. We recognize revenue for the combined performance obligation based on the amount of incurred development expenses reimbursed by the customer as a percentage

of total expected reimbursable expenses associated with the contract. The estimated total transaction price associated with the extended term of the Boehringer Ingelheim Agreement and the portion associated with performance obligations to be satisfied in the future are immaterial. As of December 31, 2018, all future potential milestone payments were excluded from the estimated total transaction price as they are considered constrained.

For the years ended December 31, 2018, 2017, and 2016, we recognized revenues of $4.4 million, $5.1 million and $5.1 million, respectively from the Boehringer Ingelheim Agreement.

**Outpost Medicine LLC.**

In April 2018, we and Outpost Medicine entered into a license agreement, or Outpost Agreement, under which Outpost Medicine has an exclusive right to advance an undisclosed, preclinical compound with potential utility in treating genitourinary disorders.

Under the Outpost Agreement, we received an upfront payment of $3.0 million, of which $1.5 million was in the form of an equity interest in Outpost Medicine. We are eligible to receive up to an aggregate of $96.5 million in success milestone payments in case of full commercial success of the potential drug product.

The promised goods and services under the Outpost Agreement are accounted for as a single performance obligation consisting of a research, development and commercialization license. Our performance obligation under the Outpost Agreement was fully satisfied at the inception of the Outpost Agreement and, accordingly, the estimated total transaction price of the Outpost Agreement was fully recognized as revenue in the second quarter of 2018. As of December 31, 2018, all future potential milestone payments were excluded from the estimated total transaction price as they are considered constrained.

For the years ended December 31, 2018 and 2017, we recognized revenues of 2.8 million and $0.2 million, respectively from the Outpost Agreement.

**Axovant Sciences GmbH.**

In May 2015, we entered into a development, marketing and supply agreement with Roivant Sciences Ltd., or Roivant. In October 2015, Roivant, assigned the exclusive rights to develop and commercialize nelotanserin to its subsidiary, Axovant. Under this agreement, Axovant has exclusive worldwide rights to develop and commercialize nelotanserin, subject to regulatory approval. We also provide certain services and will manufacture and sell nelotanserin to Axovant. We refer to this agreement as the Axovant Agreement.

Under the Axovant Agreement, we received an upfront payment of $4.0 million. We are entitled to receive payments from sales of nelotanserin under the agreement and are eligible to receive purchase price adjustment payments based on Axovant's annual net product sales. We are also eligible to receive up to an aggregate of $41.5 million in success milestones in case of full development and regulatory success of nelotanserin.

The promised goods and services under the Axovant Agreement are accounted for as two separate performance obligations: (i) a combined performance obligation consisting of commercialization rights and development and regulatory services and (ii) a manufacturing and supply commitment. We recognize revenue for the combined performance obligation consisting of commercialization rights and development and regulatory services based on the amount of incurred development expenses reimbursed by the customer as a percentage of total expected reimbursable expenses associated with the contract. In December 2018, Axovant announced negative results of an exploratory Phase 2 clinical study and a discontinuation of further clinical development activities under the nelotanserin program. As a result, we revised our estimate of the total transaction price as of December 31, 2018, based on our assessment that we will not perform any research and development services for Axovant in the future and concluded that all our performance obligations have been satisfied. As of December 31, 2018, all future potential purchase price adjustment payments and milestone payments were excluded from the estimated total transaction price as they are considered constrained.

For the years ended December 31, 2018, 2017, and 2016, and we recognized revenues of $2.2 million, $2.2 million and $2.1 million, respectively, from the Axovant Agreement.

**CRITICAL ACCOUNTING POLICIES AND MANAGEMENT ESTIMATES**

The SEC defines critical accounting policies as those that are, in management's view, important to the portrayal of our financial condition and results of operations and demanding of management's judgment. Our discussion and analysis of financial condition and results of operations is based on our consolidated financial statements, which have been prepared in accordance with the US generally accepted accounting principles, or GAAP. The preparation of these financial statements requires us to make estimates and judgments

that affect the reported amounts of assets, liabilities, revenues and expenses and related disclosures. We base our estimates on historical experience and on various assumptions that we believe are reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ significantly from those estimates.

While our significant accounting policies are described in more detail in Note 1 to our consolidated financial statements included in this Annual Report, we believe the following accounting policies are critical in the preparation of our financial statements:

**Revenue recognition.** Our revenues to date have been generated primarily through collaboration and license agreements. Our collaboration and license agreements frequently contain multiple elements including (i) intellectual property licenses, (ii) product research, development and regulatory services and (iii) product manufacturing. Consideration we receive under these arrangements may include upfront payments, research and development funding, cost reimbursements, milestone payments, payments for product sales and royalty payments.

We recognize revenue when a customer obtains control of promised goods or services. The amount of revenue recognized reflects the consideration that we expect to be entitled to receive in exchange for these services and excludes sales incentives and amounts collected on behalf of third parties. We analyze the nature of these performance obligations in the context of individual collaboration and license agreements in order to assess the distinct performance obligations. We apply the following five steps to recognize revenue:

*i) Identify the contract with a customer*. We consider the terms and conditions of our collaboration and license agreements to identify contracts within the scope of ASC 606. We consider that we have a contract with a customer when the contract is approved, we can identify each party's rights regarding the goods and services to be transferred, we can identify the payment terms for the goods and services, we have determined the customer has the ability and intent to pay and the contract has commercial substance. We use judgment in determining the customer's ability and intent to pay, which is based upon factors including the customer's historical payment experience or, for new customers, credit and financial information pertaining to the customers.

*ii) Identify the performance obligations in the contract.* Performance obligations in our collaboration and license agreements are identified based on the goods and services that will be transferred to the customer that are both capable of being distinct, whereby the customer can benefit from the service either on its own or together with other resources that are readily available from third parties or from us, and are distinct in the context of the contract, whereby the transfer of the services is separately identifiable from other promises in the contract. Our performance obligations generally consist of intellectual property licenses, research, development and/or regulatory services and manufacturing and supply commitments. Determining whether a promised goods or service is a separate performance obligation requires the use of significant judgment. A change in such judgment could result in a significant change in the period in which revenue is recognized.

Most of our collaboration and license agreements with customers contain multiple promised goods or services. Based on the characteristics of the promised goods and services we analyze whether they are separate or combined performance obligations. The transaction price is allocated to the separate performance obligations on a relative standalone selling price basis. We determine standalone selling price based on our overall pricing and discounting objectives, taking into consideration the type of services, estimates of hourly market rates, and stage of the development and clinical trials.

*iii) Determine the transaction price.* We determine the transaction price based on the consideration to which we expect to be entitled in exchange for transferring goods and services to the customer. In determining the transaction price, any variable consideration would be considered, to the extent applicable, if, in our judgment, it is probable that a significant future reversal of cumulative revenue under the contract will not occur. In accordance with the royalty exception under ASC 606 for licenses of intellectual property, the transaction price excludes future royalty payments to be received from our customers. None of our collaboration and license agreements contain consideration payable to our customer or a significant financing component. The process for determining the transaction price involves significant judgment and includes consideration of multiple factors such as estimated revenues, market size, and development risk, among other factors contemplated in negotiating the arrangement with the customer.

Our contracts with customers primarily include two types of variable consideration: (i) development and regulatory milestone payments, which are due to us upon achievement of specific development and regulatory milestones and (ii) one-time sales-based payments and sales-based royalties associated with sold or licensed intellectual property.

Due to uncertainty associated with achievement of the development and regulatory milestones, the related milestone payments are excluded from the contract consideration and the corresponding revenue is not recognized until we conclude it is probable that reversal of such milestone revenue will not occur.

Product sales-based royalties under licensed intellectual property and one-time payments are accounted for under the royalty exception. We recognize revenue for sales-based royalties under licensed intellectual property and one-time payments at the later of when the sales occur or the performance obligation is satisfied or partially satisfied.

*iv) Allocate the transaction price to performance obligations in the contract.* If the contract contains a single performance obligation, the entire transaction price is allocated to that performance obligation. Contracts that contain multiple performance obligations require an allocation of the transaction price to each performance obligation based on a relative standalone selling price.

*v) Recognize revenue when or as we satisfy a performance obligation.* Revenue is recognized at the time the related performance obligation is satisfied by transferring the promised goods or services to a customer. We recognize revenue when we transfer control of the goods or services to our customers for an amount that reflects the consideration that we expect to receive in exchange for those services.

***Performance Obligations.***

The following is a description of principal goods and services from which we generate revenue.

*Intellectual property licenses*

We generate revenue from licensing our intellectual property including know-how and development and commercialization rights. These licenses provide customers with a term-based license to further research, develop and commercialize our internally-discovered drug candidates. The consideration we receive in the form of nonrefundable upfront consideration related to the functional intellectual property licenses is recognized when we transfer such license to the customer unless the license is combined with other goods or services into one performance obligation, in which case the revenue is recognized over a period of time based on our estimated pattern in which we satisfy the combined performance obligation. Our licensing agreements are generally cancelable. Customers have the right to terminate their contracts upon notice. We have the right to terminate the contracts generally only if the customer is in breach of the contract and fails to remedy the breach in accordance with the contractual terms.

*Intellectual property sales*

We generate royalty revenue from sales of our intellectual property. We estimate the future royalty payments and recognize revenue with a corresponding contract asset at a point in time when we transfer the intellectual property to the customer. We periodically reassess our estimate of the future royalty payments and recognize any estimate adjustments as revenue in the current period.

*Research, development and regulatory services*

We generate revenue from research, development and regulatory services we provide to our customers in connection with the licensed intellectual property. The services we provide to our customers primarily include scientific research activities, preparation for and management of clinical trials, and assistance during the regulatory approval application process. Revenue associated with these services is recognized based on our estimate of total consideration to be received for such services and the pattern in which we perform the services. The pattern of performance is generally determined to be the amount of incurred expenses reimbursed by the customer as a percentage of total expected reimbursable expenses associated with the contract.

*Product manufacturing*

We generate revenue from manufacturing and clinical supply promises to our customers in connection with securing a supply of drug products for development and clinical trial purposes. The drug products are generally manufactured by our contract manufacturing organizations. We used our product manufacturing facility in Zofingen, Switzerland for a portion of the product manufacturing requirements until we sold the Manufacturing Operations on March 31, 2018 (see Note 2). Revenue associated with product manufacturing obligations is recognized at a point in time as control of the related product is transferred to the customer.

**Clinical trial expenses.** We accrue clinical trial expenses based on work performed. In determining the amount to accrue, we rely on estimates of total costs incurred based on enrollment, the completion of trials and other events. We follow this method because we believe reasonably dependable estimates of the costs applicable to various stages of a clinical trial can be made. However, the actual costs and timing of clinical trials are uncertain, subject to risks and may change depending on a number of factors. Differences between the actual clinical trial costs and the estimated clinical trial costs that we have accrued in any prior period are recognized in the subsequent period in which the actual costs become known. Historically, these differences have not been material; however, material differences could occur in the future.

**Accounting for long-lived assets.** We assess the impairment of long-lived assets, consisting of property and equipment, and finite-lived intangible assets, whenever events or circumstances indicate that the carry value may not be recoverable. Examples of such circumstances include: (1) loss of legal ownership or title to an asset; (2) significant changes in our strategic business objectives and utilization of the assets; and (3) the impact of significant negative industry or economic trends. If a change were to occur in any of the above-mentioned factors the likelihood of a material change in our net loss would increase.

If such assets are considered impaired, the impairment to be recognized is measured by the amount by which the carrying amount of the assets exceeds the fair value of the assets. In addition, we base useful lives and amortization or depreciation expense on our subjective estimate of the period that the assets will generate revenue or otherwise be used by us. The estimated fair value of the asset group is based on an estimate of the net proceeds we would receive upon disposition of the asset group to a market participant. As the estimates used are based on the best information available at the time of the estimates, additional impairment charges may be required in the future as additional facts and information become available.

**Share-based compensation.** We grant equity-based awards under our share-based compensation plan and, from time to time, under inducement awards outside of our share-based compensation plan. We estimate the fair value of stock option awards using the Black-Scholes option pricing model. This fair value is then amortized over the requisite service periods of the awards. The Black-Scholes option pricing model requires the input of subjective assumptions, including price volatility of the underlying stock, risk-free interest rate, dividend yield, and expected life of the option. We estimate the fair value of restricted stock unit awards based on the closing price of our common stock at the date of grant. Prior to 2017, we estimated forfeitures at the time of grant and revised our estimate in subsequent periods if actual forfeitures differed from those estimates. Beginning January 1, 2017, in accordance with ASU No. 2016-09, *Improvements to Employee Share-Based Payment Accounting*, we account for the forfeitures at the time they occur. Changes in assumptions used under the Black-Scholes option pricing model could materially affect our net loss and net loss per share.

**Income taxes.** Significant judgment is required by management to determine our provision for income taxes, our deferred tax assets and liabilities, and the valuation allowance to record against our net deferred tax assets, which are based on complex and evolving tax regulations throughout the world. Our tax calculation is impacted by tax rates in the jurisdictions in which we are subject to tax and the relative amount of income earned in each jurisdiction. Our deferred tax assets and liabilities are determined using the enacted tax rates expected to be in effect for the years in which those tax assets are expected to be realized.

The effect of an uncertain income tax position is recognized at the largest amount that is "more-likely-than-not" to be sustained under audit by the taxing authority. An uncertain income tax position will not be recognized if it has less than a 50% likelihood of being sustained.

The realization of our deferred tax assets is dependent upon our ability to generate sufficient future taxable income. We establish a valuation allowance when it is more-likely-than-not that the future realization of all or some of the deferred tax assets will not be achieved. The evaluation of the need for a valuation allowance is performed on a jurisdiction-by-jurisdiction basis, and includes a review of all available evidence, both positive and negative. In January 2019, a taxable income generating event, the transaction pursuant to the United Therapeutics Agreement, resulted in it being more-likely-than-not that a portion of our deferred tax assets would be realized in 2019, thus a portion of the valuation allowance in 2018 was released.

On December 22, 2017, the US government enacted comprehensive tax legislation referred to as the Tax Cuts and Jobs Act, or the Tax Act. Shortly after the Tax Act was enacted, the SEC staff issued Staff Accounting Bulletin No. 118, *Income Tax Accounting Implications of the Tax Cuts and Jobs Act*, or SAB 118, which provides guidance on accounting for the Tax Act's impact. SAB 118 provides a measurement period, which should not extend beyond one year from the Tax Act enactment date, during which a company acting in good faith may complete the accounting for the impacts of the Tax Act under ASC Topic 740, *Income Taxes,* or ASC 740. In accordance with SAB 118, the companies are required to reflect the income tax effects of the Tax Act in the reporting period in which the accounting under ASC 740 is complete. During the quarter ended December 31, 2018, we completed our accounting analysis of the impacts of the Tax Act. See Note 9 to our consolidated financial statements included in this Annual Report for additional information.

*The above listing is not intended to be a comprehensive list of all of our accounting policies. In many cases, the accounting treatment of a particular transaction is specifically dictated by GAAP. See our audited consolidated financial statements and notes thereto included elsewhere in this Annual Report, which contain additional accounting policies and other disclosures required by GAAP.*

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

***Interest Rate Risk***

We invest our excess cash in investment-grade, interest-bearing securities. The primary objective of our investment activities is to preserve principal and liquidity. To achieve this objective, we invest in a money market funds, US Treasury notes, and high-quality marketable debt instruments of corporations and government-sponsored enterprises with contractual maturity dates of generally less than two years. All investment securities have a credit rating of at least A or better, as determined by Moody's Investors Service,

Standard & Poor's or Fitch Ratings. If a 10% change in interest rates were to have occurred on December 31, 2018, this change would not have had a material effect on the fair value of our investment portfolio as of that date.

***Foreign Currency Exchange Risk***

We have a wholly owned subsidiary in Switzerland, which exposes us to foreign currency exchange risk. The functional currency of our subsidiary in Switzerland is the Swiss franc. Accordingly, all assets and liabilities of our Swiss subsidiary are translated to US dollars based on the applicable exchange rate on the balance sheet date. Revenue and expense components are translated to US dollars at weighted-average exchange rates in effect during the period. Gains and losses resulting from foreign currency translation are reported as a separate component of accumulated other comprehensive gain (loss) in the equity section of our consolidated balance sheets.

Foreign currency transaction gains and losses recorded in continuing operations are insignificant. If a 10% change in the US dollar-to-Swiss franc exchange rate were to have occurred on December 31, 2018, this change would not have had a material effect on the financial results of our continuing operations.

We have not hedged exposures denominated in foreign currencies, but may do so in the future.

**Item 8. Financial Statements and Supplementary Data.**

**ARENA PHARMACEUTICALS, INC.**

**INDEX TO CONSOLIDATED FINANCIAL STATEMENTS**

**Report of Independent Registered Public Accounting Firm**

To the Stockholders and Board of Directors
Arena Pharmaceuticals, Inc.:

*Opinion on the Consolidated Financial Statements*

We have audited the accompanying consolidated balance sheets of Arena Pharmaceuticals, Inc. and subsidiaries (the Company) as of December 31, 2018 and 2017, the related consolidated statements of operations and comprehensive loss, equity, and cash flows for each of the years in the three-year period ended December 31, 2018, and the related notes (collectively, the consolidated financial statements). In our opinion, the consolidated 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 years in the three-year period ended December 31, 2018, in conformity with U.S. generally accepted accounting principles

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2018, based on criteria established in *Internal Control – Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission, and our report dated February 28, 2019, expressed an unqualified opinion on the effectiveness of the Company's internal control over financial reporting.

*Change in Accounting Principle*

As discussed in Note 1 to the consolidated financial statements, the Company changed its method of recognizing revenue in 2018 due to the adoption of ASU No. 2014-09, *Revenue from Contracts with Customers (Topic 606)*, as amended.

*Basis for Opinion*

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

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the consolidated 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 consolidated 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 consolidated financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/ KPMG LLP

We have served as the Company's auditor since 2010.

San Diego, California
February 28, 2019

**ARENA PHARMACEUTICALS, INC.**

**Consolidated Balance Sheets**
(In thousands, except share and per share data)

| | December 31, 2018 | December 31, 2017 |
|---|---|---|
| **Assets** | | |
| Current assets: | | |
| Cash and cash equivalents | $ 161,037 | $ 158,837 |
| Short-term investments, available-for-sale | 284,594 | 88,240 |
| Accounts receivable | 5,086 | 2,357 |
| Prepaid expenses and other current assets | 10,008 | 2,681 |
| Insurance recovery receivable | — | 12,025 |
| Assets of disposal group held for sale | — | 17,140 |
| Total current assets | 460,725 | 281,280 |
| Investments, available-for-sale | 82,412 | 24,242 |
| Land, property and equipment, net | 23,114 | 30,131 |
| Deferred tax assets | 110,333 | — |
| Other non-current assets | 10,319 | 3,622 |
| Total assets | $ 686,903 | $ 339,275 |
| **Liabilities and Stockholders' Equity** | | |
| Current liabilities: | | |
| Accounts payable and other accrued liabilities | $ 16,181 | $ 7,916 |
| Accrued clinical and preclinical study fees | 10,454 | 7,706 |
| Current portion of lease financing obligations | 3,283 | 4,000 |
| Accrued litigation settlement | — | 24,000 |
| Current portion of deferred revenues | — | 1,110 |
| Liabilities of disposal group held for sale | — | 27,595 |
| Total current liabilities | 29,918 | 72,327 |
| Lease financing obligations, less current portion | 49,426 | 57,748 |
| Other long-term liabilities | 1,301 | 989 |
| Deferred revenues, less current portion | — | 1,067 |
| Commitments and contingencies | | |
| Stockholders' Equity: | | |
| Preferred stock, $0.0001 par value, 7,500,000 shares authorized, no shares issued and outstanding at December 31, 2018, and 2017 | — | — |
| Common stock, $0.0001 par value, 73,500,000 shares authorized at December 31, 2018, and 2017; 49,422,991 shares issued and outstanding at December 31, 2018; 39,280,687 shares issued and outstanding at December 31, 2017 | 5 | 4 |
| Additional paid-in capital | 2,106,960 | 1,698,543 |
| Accumulated other comprehensive loss | (155) | (1,216) |
| Accumulated deficit | (1,500,552) | (1,490,187) |
| Total stockholders' equity | 606,258 | 207,144 |
| Total liabilities and equity | $ 686,903 | $ 339,275 |

See accompanying notes to consolidated financial statements.

**ARENA PHARMACEUTICALS, INC.**

**Consolidated Statements of Operations and Comprehensive Loss**
(In thousands, except per share data)

| | Years ended December 31, | | |
|---|---|---|---|
| | **2018** | **2017** | **2016** |
| **Revenues** | | | |
| Collaboration and other revenue | $ 11,402 | $ 19,632 | $ 92,163 |
| Royalty revenue | 6,568 | 1,705 | — |
| Total revenues | 17,970 | 21,337 | 92,163 |
| **Operating costs and expenses** | | | |
| Research and development | 115,029 | 70,988 | 63,782 |
| General and administrative | 47,724 | 30,341 | 27,529 |
| Litigation settlement expense, net | — | 11,975 | — |
| Restructuring charges | — | — | 6,115 |
| Total operating costs and expenses | 162,753 | 113,304 | 97,426 |
| Loss from operations | (144,783) | (91,967) | (5,263) |
| **Interest and other income (expense)** | | | |
| Interest income | 8,772 | 492 | 290 |
| Interest expense | (5,695) | (6,119) | (6,512) |
| Other income (expense) | 2,872 | 1,740 | (815) |
| Total interest and other income (expense), net | 5,949 | (3,887) | (7,037) |
| Loss from continuing operations before income taxes | (138,834) | (95,854) | (12,300) |
| Income tax benefit | 110,265 | — | — |
| Loss from continuing operations | (28,569) | (95,854) | (12,300) |
| Income (loss) from discontinued operations | (830) | 3,122 | (10,596) |
| Net loss | (29,399) | (92,732) | (22,896) |
| Less net loss attributable to noncontrolling interest in consolidated variable interest entity | — | 1,325 | 380 |
| Net loss attributable to stockholders of Arena | $ (29,399) | $ (91,407) | $ (22,516) |
| | | | |
| **Amounts attributable to stockholders of Arena:** | | | |
| Loss from continuing operations | $ (28,569) | $ (94,529) | $ (11,920) |
| Income (loss) from discontinued operations | (830) | 3,122 | (10,596) |
| | $ (29,399) | $ (91,407) | $ (22,516) |
| | | | |
| **Net income (loss) attributable to stockholders of Arena per share, basic and diluted:** | | | |
| Continuing operations | $ (0.61) | $ (2.87) | $ (0.49) |
| Discontinued operations | (0.02) | 0.10 | (0.44) |
| | $ (0.63) | $ (2.77) | $ (0.93) |
| | | | |
| Shares used in calculating net income (loss) attributable to stockholders of Arena per share, basic and diluted | 47,041 | 32,990 | 24,313 |
| | | | |
| Comprehensive Loss: | | | |
| Net loss | $ (29,399) | $ (92,732) | $ (22,896) |
| Foreign currency translation adjustment | 72 | 2,016 | (1,920) |
| Unrealized loss on available-for-sale investments | (113) | (133) | — |
| Comprehensive loss | (29,440) | (90,849) | (24,816) |
| Less comprehensive loss attributable to noncontrolling interest in consolidated variable interest entity | — | 1,325 | 380 |
| Comprehensive loss attributable to stockholders of Arena | $ (29,440) | $ (89,524) | $ (24,436) |

See accompanying notes to consolidated financial statements.

**ARENA PHARMACEUTICALS, INC.**

**Consolidated Statements of Equity**

(In thousands, except share data)

| | Common Stock | | Additional Paid-In Capital | Accumulated Other Comprehensive Income (Loss) | Accumulated Deficit | Total Equity Attributable to Stockholders of Arena | Equity Attributable to Noncontrolling Interest in Consolidated Variable Interest Entity | Total Equity |
|---|---|---|---|---|---|---|---|---|
| | Shares | Amount | | | | | | |
| **Balance at December 31, 2015** | **24,287,118** | **2** | **1,430,939** | **(1,179)** | **(1,376,220)** | **53,542** | **—** | **53,542** |
| Issuance of common stock upon exercise of options | 11,556 | — | 179 | — | — | 179 | — | 179 |
| Issuance of common stock under employee stock purchase plan | 14,140 | — | 203 | — | — | 203 | — | 203 |
| Issuance of common stock upon vesting of restricted stock unit awards | 27,266 | — | — | — | — | — | — | — |
| Share-based compensation expense, net of forfeitures | — | — | 11,117 | — | — | 11,117 | — | 11,117 |
| Share-based compensation expense capitalized | — | — | 170 | — | — | 170 | — | 170 |
| Contribution to variable interest entity | — | — | (871) | — | — | (871) | 871 | — |
| Translation loss | — | — | — | (1,920) | — | (1,920) | — | (1,920) |
| Net loss | — | — | — | — | (22,516) | (22,516) | (380) | (22,896) |
| **Balance at December 31, 2016** | **24,340,080** | **2** | **1,441,737** | **(3,099)** | **(1,398,736)** | **39,904** | **491** | **40,395** |
| Adoption of ASU No. 2016-09 | — | — | 44 | — | (44) | — | — | — |
| Issuance of common stock to underwriters, net | 14,087,500 | 2 | 236,386 | — | — | 236,388 | — | 236,388 |
| Issuance of common stock under the ATM facility, net | 489,023 | — | 6,987 | — | — | 6,987 | — | 6,987 |
| Issuance of common stock upon exercise of options | 323,431 | — | 5,404 | — | — | 5,404 | — | 5,404 |
| Issuance of common stock under employee stock purchase plan and upon vesting of restricted stock unit awards | 40,653 | — | 12 | — | — | 12 | — | 12 |
| Share-based compensation expense | — | — | 7,973 | — | — | 7,973 | 17 | 7,990 |
| Unrealized loss on available-for-sale investments | — | — | — | (133) | — | (133) | — | (133) |
| Translation gain | — | — | — | 2,016 | — | 2,016 | — | 2,016 |
| Net loss | — | — | — | — | (91,407) | (91,407) | (1,325) | (92,732) |
| Deconsolidation of variable interest entity | — | — | — | — | — | — | 817 | 817 |
| **Balance at December 31, 2017** | **39,280,687** | **4** | **1,698,543** | **(1,216)** | **(1,490,187)** | **207,144** | **—** | **207,144** |
| Adoption of ASC 606 | — | — | — | 1,102 | 19,034 | 20,136 | — | 20,136 |
| Issuance of common stock to underwriters, net | 9,775,000 | 1 | 383,141 | — | — | 383,142 | — | 383,142 |
| Issuance of common stock upon exercise of options | 317,636 | — | 5,888 | — | — | 5,888 | — | 5,888 |
| Issuance of common stock upon vesting of restricted stock unit awards | 49,668 | — | (166) | — | — | (166) | — | (166) |
| Share-based compensation expense | — | — | 19,554 | — | — | 19,554 | — | 19,554 |
| Unrealized loss on available-for-sale investments | — | — | — | (113) | — | (113) | — | (113) |
| Translation gain | — | — | — | 72 | — | 72 | — | 72 |
| Net loss | — | — | — | — | (29,399) | (29,399) | — | (29,399) |
| **Balance at December 31, 2018** | **49,422,991** | **$ 5** | **$ 2,106,960** | **$ (155)** | **$ (1,500,552)** | **$ 606,258** | **$ —** | **$ 606,258** |

See accompanying notes to consolidated financial statements.

**ARENA PHARMACEUTICALS, INC.**

**Consolidated Statements of Cash Flows**
(In thousands)

| | Years ended December 31, | | |
|---|---|---|---|
| | **2018** | **2017** | **2016** |
| **Operating activities:** | | | |
| Net loss | $ (29,399) | $ (92,732) | $ (22,896) |
| Adjustments to reconcile net loss to net cash used in operating activities: | | | |
| (Income) loss from discontinued operations | 830 | (3,122) | 10,596 |
| Depreciation and amortization | 3,759 | 4,278 | 4,994 |
| Deferred income taxes | (110,333) | — | — |
| Non-cash collaboration revenue | (1,500) | — | — |
| Non-cash royalty revenue | (3,315) | — | — |
| Share-based compensation | 19,543 | 7,855 | 11,075 |
| Litigation settlement expense, net | — | 11,975 | — |
| Amortization of prepaid financing costs | 110 | 136 | 136 |
| Amortization of original issue discounts, net of premiums, on available-for-sale investments | (664) | — | — |
| Loss (gain) on disposal of property and equipment | (791) | (379) | 1,270 |
| Changes in operating assets and liabilities: | | | |
| Accounts receivable | (2,760) | 10,787 | (12,246) |
| Prepaid expenses and other assets | (2,929) | 585 | 2,416 |
| Payables and accrued liabilities | 10,871 | 1,803 | 2,410 |
| Accrued litigation settlement | (11,975) | — | — |
| Deferred revenues | (2,061) | (4,401) | (69,078) |
| Other long-term liabilities | (1,265) | (577) | 30 |
| Net cash used in operating activities - continuing operations | (131,879) | (63,792) | (71,293) |
| Net cash provided by (used in) operating activities - discontinued operations | (333) | (2,850) | 9,817 |
| Net cash used in operating activities | (132,212) | (66,642) | (61,476) |
| **Investing activities:** | | | |
| Purchases of available-for-sale investments | (364,539) | (112,615) | — |
| Proceeds from sale and maturity of available-for-sale investments | 110,564 | — | — |
| Deconsolidation of variable interest entity | — | (406) | — |
| Purchases of property and equipment | (692) | (113) | (814) |
| Proceeds from sale of property and equipment | — | 789 | 954 |
| Other non-current assets | (11) | (5) | (654) |
| Net cash used in investing activities - continuing operations | (254,678) | (112,350) | (514) |
| Net cash provided by (used in) investing activities - discontinued operations | 3,405 | (40) | (236) |
| Net cash used in investing activities | (251,273) | (112,390) | (750) |
| **Financing activities:** | | | |
| Principal payments on lease financing obligations | (4,000) | (3,518) | (2,979) |
| Proceeds from issuance of common stock | 389,031 | 248,805 | 370 |
| Other financing activities | — | — | 320 |
| Net cash provided by (used in) financing activities | 385,031 | 245,287 | (2,289) |
| Effect of exchange rate changes on cash | 654 | 1,870 | (294) |
| Net increase (decrease) in cash, cash equivalents and restricted cash | 2,200 | 68,125 | (64,809) |
| Cash, cash equivalents and restricted cash at beginning of year | 159,700 | 91,575 | 156,384 |
| Cash, cash equivalents and restricted cash at end of year | $ 161,900 | $ 159,700 | $ 91,575 |

| | | | |
|---|---|---|---|
| **Supplemental disclosure of cash flow information:** | | | |
| Interest paid | $ 5,696 | $ 5,967 | $ 6,303 |
| | | | |
| **Supplemental disclosure of non-cash investing and financing information:** | | | |
| Disposition of property and land upon lease expiration | $ 3,944 | $ — | $ — |
| Reduction in lease financing obligation from release of residual value upon lease expiration | $ 5,039 | $ — | $ — |

See accompanying notes to consolidated financial statements.

## 1. The Company and Summary of Significant Accounting Policies

### The Company

Arena Pharmaceuticals, Inc., or Arena, was incorporated on April 14, 1997, and commenced operations in July 1997. We are a biopharmaceutical company focused on delivering novel, transformational medicines with optimized pharmacology and pharmacokinetics to patients globally. Our proprietary, internally-developed pipeline includes multiple potentially first- or best-in-class assets with broad clinical utility.

Our most advanced investigational clinical programs are: etrasimod, which we are evaluating in late-stage clinical programs in ulcerative colitis and Crohn's disease, as well as progressing programs for atopic dermatitis and other indications; olorinab for a broad range of visceral pain conditions and which we are evaluating in a Phase 2 trial for treatment of gastrointestinal pain; and ralinepag, which our licensee, United Therapeutics, is evaluating in a Phase 3 program for pulmonary arterial hypertension. We continue to assess other earlier research and development stage drug candidates, including APD418, a first-in-class calcium-independent myofilament derepressor which we are studying in a preclinical program the treatment of decompensated heart failure.

We operate in one business segment. Our primary clinical operations are conducted in San Diego, California and Boston, Massachusetts; and in Zug, Switzerland by Arena Pharmaceuticals Development GmbH, or APD GmbH, our wholly-owned subsidiary.

In November 2018, we entered into a collaboration and license agreement, or the United Therapeutics Agreement, with United Therapeutics Corporation, or United Therapeutics. Under the United Therapeutics Agreement, we granted United Therapeutics an exclusive, worldwide, royalty-bearing license to develop, manufacture and commercialize ralinepag in any formulation. This transaction was completed on January 24, 2019. Upon the closing of this transaction, in January 2019, we received a non-refundable upfront payment of $800.0 million. We are also eligible to receive up to an aggregate of $400.0 million in regulatory milestone payments related to ralinepag, consisting of a payment of $150.0 million upon first marketing approval of an oral formulation of ralinepag in a major non-U.S. market, and a payment of $250.0 million upon U.S. marketing approval of an inhaled formulation of ralinepag to treat pulmonary arterial hypertension, as well as low double-digit, tiered royalties on net sales of ralinepag products, subject to certain adjustments for third party license payments. United Therapeutics will be responsible for all development, manufacture and commercialization of the licensed products globally. In connection with this transaction we incurred advisory fees of approximately $17.0 million, of which $2.4 million was incurred in 2018 and is included in general and administrative expenses in the consolidated statement of operations.

Additionally, we have collaborations and license agreements with the following pharmaceutical companies: Everest Medicines Limited, or Everest, (etrasimod in Greater China and select countries in Asia), Boehringer Ingelheim International GmbH, or Boehringer Ingelheim, (undisclosed target – preclinical), Outpost Medicine, LLC, or Outpost Medicine, (undisclosed compound with potential utility in treating genitourinary disorders - preclinical) and Eisai Co., Ltd. and Eisai Inc., or collectively, Eisai (BELVIQ®/BELVIQ XR® - marketed products).

### Basis of Presentation

The accompanying consolidated financial statements have been prepared in accordance with the US generally accepted accounting principles, or GAAP, and reflect all of our activities, including those of our wholly owned subsidiaries. All material intercompany accounts and transactions have been eliminated in consolidation. As a result of the sale of our Manufacturing Operations (see Note 5), the operations and cash flows of the Manufacturing Operations are reflected as discontinued operations and the related assets and liabilities as held for sale.

The accompanying consolidated financial statements also include the activity of Beacon Discovery, Inc., or Beacon, a variable interest entity in which we had a controlling financial interest until December 2017 at which point we deconsolidated Beacon (see Note 13). The results of operations and comprehensive loss attributable to the noncontrolling interest in Beacon are presented as separate components from the results of operations and comprehensive loss attributable to the stockholders of Arena in the consolidated statements of operations and comprehensive loss.

On June 14, 2017, we filed a certificate of amendment to our certificate of incorporation with the Secretary of State of the State of Delaware to effect a one-for-ten reverse split of our issued and outstanding common stock. The accompanying consolidated financial statements and notes thereto give retrospective effect to the reverse stock split for all periods presented. All issued and outstanding common stock, options exercisable for common stock, restricted stock units, performance restricted stock units, and per share amounts contained in the consolidated financial statements have been retrospectively adjusted to reflect this reverse stock split for all periods presented. Concurrent with the reverse stock split we effected a reduction in the number of authorized shares of common stock from 367,500,000 shares to 73,500,000 shares.

**Liquidity**

As of December 31, 2018, we had cash, cash equivalents and available-for-sale investments of approximately $528.0 million. In January 2019, we received an $800.0 million upfront payment from United Therapeutics. We believe our cash, cash equivalents and available-for-sale investments will be sufficient to fund our operations for at least the next 12 months from the date these consolidated financial statements are issued.

We will require substantial cash to achieve our objectives of discovering, developing and commercializing drugs, as this process typically takes many years and potentially hundreds of millions of dollars for an individual drug. We may not have adequate available cash, or assets that could be readily turned into cash, to meet these objectives in the long term. We will need to obtain significant funds under our existing collaborations and license agreements, under new collaboration, licensing or other commercial agreements for one or more of our drug candidates and programs or patent portfolios, or from other potential sources of liquidity, which may include the sale of equity, issuance of debt or other transactions.

**Recent Accounting Pronouncements**

**Leases.**

In February 2016, the Financial Accounting Standards Board, or FASB, established Topic 842, *Leases*, by issuing Accounting Standards Update, or ASU, No. 2016-02, which requires lessees to recognize leases on-balance sheet and disclose key information about leasing arrangements. Topic 842 was subsequently amended by ASU No. 2018-01, *Land Easement Practical Expedient for Transition to Topic 842*; ASU No. 2018-10, *Codification Improvements to Topic 842*, Leases; and ASU No. 2018-11, *Targeted Improvements*. The new standard establishes a right-of-use model, or ROU, that requires a lessee to recognize a ROU asset and lease liability on the balance sheet for all leases with a term longer than 12 months. Leases will be classified as finance or operating, with classification affecting the pattern and classification of expense recognition in the income statement.

A modified retrospective transition approach is required, applying the new standard to all leases existing at the date of initial application. An entity may choose to use either (1) its effective date or (2) the beginning of the earliest comparative period presented in the financial statements as its date of initial application. We will adopt the new lease standard effective January 1, 2019 and use the effective date as our date of initial application. Consequently, financial information will not be updated and the disclosures required under the new standard will not be provided for dates and periods before January 1, 2019.

The new standard provides a number of optional practical expedients in transition. We expect to elect the package of practical expedients, which permits us not to reassess under the new standard our prior conclusions about lease identification, lease classification and initial direct costs. We do not expect to elect the use-of-hindsight or the practical expedient pertaining to land easements; the latter not being applicable to us.

We expect that this standard will not have a material effect on our financial statements. While we continue to assess all of the effects of adoption, we currently believe the most significant effects relate to (1) the recognition of new ROU assets and lease liabilities on our balance sheet for our real property operating lease; and (2) providing significant new disclosures about our leasing activities.

On adoption, we currently expect to recognize an additional operating lease liability with a corresponding ROU asset based on the present value of the remaining minimum rental payments under current leasing standards for an existing operating lease.

The new standard also provides practical expedients for an entity's ongoing accounting. We currently expect to elect the short-term lease recognition exemption for our office equipment leases. This means, for those leases that qualify, we will not recognize ROU assets or lease liabilities, and this includes not recognizing ROU assets or lease liabilities for existing short-term leases of those assets in transition.

**Other.**

In January 2016, the FASB issued ASU No. 2016-01, *Recognition and Measurement of Financial Assets and Financial Liabilities*. ASU No. 2016-01 supersedes and amends the guidance to classify equity securities with readily determinable fair values into different categories (that is, trading or available-for-sale) and requires equity securities to be measured at fair value with changes in the fair value recognized through net income. The amendments allow equity investments that do not have readily determinable fair values to be remeasured at fair value either upon the occurrence of an observable price change or upon identification of an impairment. The amendments also require enhanced disclosures about those investments. In accordance with ASU No. 2016-01, we adopted this standard in the first quarter of 2018. The adoption of ASU No. 2016-01 did not have a material impact on our consolidated financial statements.

In November 2016, the FASB issued ASU No. 2016-18, *Restricted Cash*. ASU No. 2016-18 requires that restricted cash be included with cash and cash equivalents when reconciling the beginning-of-period and end-of-period total amounts shown in the statement of cash flows. In accordance with ASU No. 2016-18, we adopted this standard in the first quarter of 2018 and retrospectively adjusted the consolidated statement of cash flows for the years ended December 31, 2017 and 2016, to conform to the current period's presentation. The adoption of ASU No. 2016-18 did not have a material impact on our consolidated financial statements.

The following table provides a reconciliation of the components of cash, cash equivalents and restricted cash reported in our consolidated balance sheets to the total of the amount presented in the consolidated statements of cash flows, in thousands:

| | December 31, 2018 | December 31, 2017 |
|---|---|---|
| Cash and cash equivalents | $ 161,037 | $ 158,837 |
| Restricted cash included in other non-current assets | 863 | 863 |
| Total cash, cash equivalents and restricted cash presented in the consolidated statement of cash flows | $ 161,900 | $ 159,700 |

The restricted cash relates to our property leases. The restriction will lapse when the related leases expire.

In May 2017, the FASB issued ASU No. 2017-09, *Scope of Modification Accounting*. ASU No. 2017-09 clarifies which changes to the terms or conditions of a share-based payment award require an entity to apply modification accounting. This guidance is to be applied prospectively to awards modified on or after the adoption date and is effective for fiscal years, and interim periods within those years, beginning after December 15, 2017, with early adoption permitted. In accordance with ASU No. 2017-09, we adopted this standard prospectively in the first quarter of 2018. The adoption of ASU No. 2017-09 did not have a material impact on our consolidated financial statements.

In November 2018, the FASB issued ASU No. 2018-18, *Collaborative Arrangements (Topic 808)—Clarifying the Interaction between Topic 808 and Topic 606*. The amendments in ASU No. 2018-18 make targeted improvements to generally accepted accounting principles for collaborative arrangements by clarifying that certain transactions between collaborative arrangement participants should be accounted for as revenue under Accounting Standard Codification 606, *Revenue from Contracts with Customers*, or ASC 606, when the collaborative arrangement participant is a customer in the context of a unit of account. In those situations, all the guidance in ASC 606 should be applied, including recognition, measurement, presentation, and disclosure requirements. In addition, unit-of-account guidance in ASC 808 was aligned with the guidance in ASC 606 when an entity is assessing whether the collaborative arrangement or a part of the arrangement is within the scope of ASC 606. ASU No. 2018-18 is effective for fiscal years beginning after December 15, 2019, and interim periods within those fiscal years. Early adoption is permitted, including adoption in any interim period. The amendments in ASU No. 2018-18 are required to be applied retrospectively to the date of initial application of ASC 606. We are currently evaluating the impact of ASU No. 2018-08 on our consolidated financial statements.

**Use of Estimates**

The preparation of financial statements in conformity with GAAP requires our management to make estimates and assumptions that affect the reported amounts (including assets, liabilities, revenues and expenses) and related disclosures. The amounts reported could differ under different estimates and assumptions.

**Cash and Cash Equivalents**

Cash and cash equivalents consist of cash and highly liquid investments with remaining maturities of three months or less when purchased.

**Available-for-Sale Investments**

We define investments as income-yielding securities that can be readily converted to cash, and classify such investments as available-for-sale. We carry these securities at fair value, and report unrealized gains and losses as a separate component of accumulated other comprehensive income or loss. The cost of debt securities is adjusted for amortization of premiums and accretion of discounts to maturity. Such amortization and accretion is included in interest income. Realized gains and losses and declines in securities judged to be other than temporary are included in other income or expense. The cost of securities sold is based on the specific identification method. Interest and dividends on available-for-sale securities are included in interest income.

**Concentrations of Risk**

Financial instruments, which potentially subject us to concentrations of credit risk, consist primarily of cash and cash equivalents and available-for-sale investments. We limit our exposure to credit loss by holding our cash primarily in US dollars or placing our cash and investments in US government, agency or government-sponsored enterprise obligations and in corporate debt instruments that are rated investment grade, in accordance with an investment policy approved by our Board of Directors.

Our customers are typically other biopharmaceutical companies to which we license our intellectual property, or sell research and development services or other services under license or collaboration agreements. For the year ended December 31, 2018, Eisai, Boehringer Ingelheim, Outpost Medicine, Axovant and Everest accounted for 36.6%, 24.8%, 15.3%, 12.1% and 11.1%, respectively, of our total revenues. For the year ended December 31, 2017, Everest, Boehringer Ingelheim and Axovant accounted for 56.2%, 23.8%, and 10.5%, respectively, of our total revenues. For the year ended December 31, 2016, more than 90% of our annual revenues was from Eisai and other BELVIQ distributors.

As of December 31, 2018, Boehringer Ingelheim and Eisai accounted for 72.0%, and 27.1% of our accounts receivable. As of December 31, 2017, Eisai, Axovant and Boehringer Ingelheim accounted for 61.1%, 17.6%, and 14.8%, respectively of our accounts receivable. We monitor our customers' financial credit worthiness in order to assess and respond to any changes in their credit profile. During the years ended December 31, 2018, 2017, and 2016, we did not record any write-offs or reserves against accounts receivable.

**Property and Equipment**

Property and equipment are stated at cost and depreciated over the estimated useful lives of the assets (generally 3 to 15 years) using the straight-line method. Buildings are stated at cost and depreciated over an estimated useful life of approximately 20 years using the straight-line method. Leasehold improvements are stated at cost and amortized over the shorter of the estimated useful lives of the assets or the lease term using the straight-line method. Capital improvements are stated at cost and amortized over the estimated useful lives of the underlying assets using the straight-line method.

**Long-lived Assets**

If indicators of impairment exist, we assess the recoverability of the affected long-lived assets by determining whether the carrying value of such assets can be recovered through undiscounted cash flows. If impairment is indicated, we measure the impairment loss by comparing the fair value to the carrying value of the asset.

**Deferred Rent**

For financial reporting purposes, rent expense and rental income are recognized on a straight-line basis over the term of the underlying lease or sublease. The difference between rent expense or rental income and amounts paid under lease agreements is recorded as an asset or a liability in our consolidated balance sheets.

**Foreign Currency**

The functional currency of our wholly owned subsidiaries in Switzerland, APD GmbH and, until March 31, 2108, Arena Pharmaceuticals GmbH, or Arena GmbH, was the Swiss franc. Accordingly, all assets and liabilities of these subsidiaries are translated to US dollars based on the applicable exchange rate on the balance sheet date. Revenue and expense components are translated to US dollars at weighted-average exchange rates in effect during the period. Gains and losses resulting from foreign currency translation are reported as a separate component of accumulated other comprehensive income or loss in the equity section of our consolidated balance sheets.

Foreign currency transaction gains and losses are primarily the result of remeasuring US dollar-denominated receivables and payables of our foreign subsidiaries. Foreign currency transaction gains and losses recorded by Arena GmbH are included in net income (loss) from discontinued operations.

**Share-based Compensation**

Our share-based awards are measured at fair value and recognized over the requisite service or performance period. The fair value of each stock option is estimated on the date of grant using the Black-Scholes option pricing model, based on the market price of the underlying common stock, expected term, expected stock price volatility and expected risk-free interest rate. Expected volatility is computed using a combination of historical volatility for a period equal to the expected term and implied volatilities from traded options to buy our common stock, with historical volatility being weighted at 75%. The expected term of options is determined based on historical experience of similar awards, giving consideration to the contractual terms of the share-based awards, vesting schedules and post-vesting terminations. The risk-free interest rates are based on the US Treasury yield curve, with a remaining term approximately equal to the expected term used in the option pricing model. We account for the forfeitures in the period they occur. The fair value of each restricted stock unit award is estimated based on the market price of the underlying common stock on the date of the grant. The fair value of restricted stock unit awards that include market-based performance conditions is estimated on the date of grant using a Monte Carlo simulation model, based on the market price of the underlying common stock, expected performance measurement period, expected stock price volatility and expected risk-free interest rate.

**Revenue Recognition**

Our revenues to date have been generated primarily through collaboration and license agreements. Our collaboration and license agreements frequently contain multiple elements including (i) intellectual property licenses, (ii) product research, development and regulatory services and (iii) product manufacturing. Consideration we receive under these arrangements may include upfront payments, research and development funding, cost reimbursements, milestone payments, payments for product sales and royalty payments. Our customers include Everest, Outpost Medicine, Eisai, Axovant Sciences GmbH, or Axovant, Boehringer Ingelheim, and Siegfried AG, or Siegfried.

Effective January 1, 2018, we adopted Accounting Standard Codification 606, *Revenue from Contracts with Customers*, or ASC 606, issued by the Financial Accounting Standards Board, or FASB. As a result, we have changed our accounting policy for revenue recognition as detailed below.

We implemented ASC 606 using the modified retrospective method by recognizing the cumulative effect of initially applying ASC 606 as an adjustment to the opening balance of our accumulated deficit at January 1, 2018. Therefore, the comparative period information has not been adjusted.

We applied ASC 606 using a practical expedient for contracts that were modified before the implementation date, which allowed us to determine an aggregate effect of all modifications that occurred before January 1, 2018, when determining the satisfied and unsatisfied performance obligations, the transaction price, and allocating that transaction price to the performance obligations instead of retrospectively restating the contracts for such contract modifications.

The cumulative impact to our accumulated deficit balance at January 1, 2018, as a result of the adoption of ASC 606 was a decrease of $19.0 million. The decrease arose primarily from a reduction of deferred revenue balances related to upfront payments received from customers and recognition of contract assets due to a combination of (i) the effects of applying the practical expedient for contract modifications and our conclusions related to satisfied and unsatisfied performance obligations, which resulted in a relatively higher portion of the total transaction price recognized as revenue in periods prior to our adoption of ASC 606, (ii) the effect of the bill-and-hold accounting guidance for inventory in ASC 606 and (iii) the inclusion of estimated future royalty payments related to our intellectual property in the total transaction price to the extent such intellectual property was legally sold to our customer rather than licensed. The cumulative effect adjustment is net of an impairment loss of $13.1 million which was a direct effect of the adoption of ASC 606 on the asset group of the Manufacturing Operations, which was classified as assets of disposal group held for sale since December 2017.

The following table summarizes the impacts of adopting ASC 606 on our consolidated financial statements, in thousands.

| | Impact of Changes in Accounting Policies | | |
|---|---|---|---|
| **Three months ended December 31, 2018 (unaudited)** | **As reported** | **Adjustments** | **Balances without adoption of ASC 606** |
| Collaboration and other revenue | $ 6,878 | $ 56 | $ 6,934 |
| Royalty revenue | 1,770 | (393) | 1,377 |
| Total revenues | 8,648 | (337) | 8,311 |
| Loss from operations | (44,644) | (337) | (44,981) |
| Loss from continuing operations | 68,711 | (337) | 68,374 |
| Net loss | 68,711 | (337) | 68,374 |
| Net loss attributable to stockholders of Arena | 68,711 | (337) | 68,374 |
| | | | |
| **Year ended December 31, 2018** | | | |
| Collaboration and other revenue | $ 11,402 | $ 105 | $ 11,507 |
| Royalty revenue | 6,568 | (1,847) | 4,721 |
| Total revenues | 17,970 | (1,742) | 16,228 |
| Loss from operations | (144,783) | (1,742) | (146,525) |
| Loss from continuing operations | (28,569) | (594) | (29,163) |
| Income (loss) from discontinued operations | (830) | 13,660 | 12,830 |
| Net loss | (29,399) | 13,066 | (16,333) |
| Net loss attributable to stockholders of Arena | (29,399) | 13,066 | (16,333) |
| | | | |
| **As of December 31, 2018** | | | |
| Prepaid expenses and other current assets | $ 10,008 | $ (1,484) | $ 8,524 |
| Total current assets | 460,725 | (1,484) | 459,241 |
| Other non-current assets | 10,319 | (4,471) | 5,848 |
| Total assets | 686,903 | (5,955) | 680,948 |
| Current portion of deferred revenues | — | 10 | 10 |
| Total current liabilities | 29,918 | 10 | 29,928 |
| Accumulated deficit | (1,500,552) | (5,965) | (1,506,517) |
| Total stockholders' equity | 606,258 | (5,965) | 600,293 |
| Total liabilities and stockholders' equity | 686,903 | (5,955) | 680,948 |

Under ASC 606, revenue is recognized when a customer obtains control of promised goods or services. The amount of revenue recognized reflects the consideration that we expect to be entitled to receive in exchange for these services and excludes sales incentives and amounts collected on behalf of third parties. We analyze the nature of these performance obligations in the context of individual collaboration and license agreements in order to assess the distinct performance obligations. We apply the following five steps to recognize revenue:

*i) Identify the contract with a customer*. We consider the terms and conditions of our collaboration and license agreements to identify contracts within the scope of ASC 606. We consider that we have a contract with a customer when the contract is approved, we can identify each party's rights regarding the goods and services to be transferred, we can identify the payment terms for the goods and services, we have determined the customer has the ability and intent to pay and the contract has commercial substance. We use judgment in determining the customer's ability and intent to pay, which is based upon factors including the customer's historical payment experience or, for new customers, credit and financial information pertaining to the customers.

*ii) Identify the performance obligations in the contract.* Performance obligations in our collaboration and license agreements are identified based on the goods and services that will be transferred to the customer that are both capable of being distinct, whereby the customer can benefit from the service either on its own or together with other resources that are readily available from third parties or from us, and are distinct in the context of the contract, whereby the transfer of the services is separately identifiable from other promises in the contract. Our performance obligations generally consist of intellectual property licenses, research, development and/or regulatory services and manufacturing and supply commitments.

*iii) Determine the transaction price.* We determine the transaction price based on the consideration to which we expect to be entitled in exchange for transferring goods and services to the customer. In determining the transaction price, any variable consideration would be considered, to the extent applicable, if, in our judgment, it is probable that a significant future reversal of cumulative revenue under the contract will not occur. In accordance with the royalty exception under ASC 606 for licenses of intellectual property, the transaction price excludes future royalty payments to be received from our customers. None of our collaboration and license agreements contain consideration payable to our customer or a significant financing component.

*iv) Allocate the transaction price to performance obligations in the contract.* If the contract contains a single performance obligation, the entire transaction price is allocated to that performance obligation. Contracts that contain multiple performance obligations require an allocation of the transaction price to each performance obligation based on a relative standalone selling price.

*v) Recognize revenue when or as we satisfy a performance obligation.* Revenue is recognized at the time the related performance obligation is satisfied by transferring the promised goods or services to a customer. We recognize revenue when we transfer control of the goods or services to our customers for an amount that reflects the consideration that we expect to receive in exchange for those services.

***Performance Obligations.***

The following is a description of principal goods and services from which we generate revenue.

*Intellectual property licenses*

We generate revenue from licensing our intellectual property including know-how and development and commercialization rights. These licenses provide customers with a term-based license to further research, develop and commercialize our internally-discovered drug candidates. The consideration we receive in the form of nonrefundable upfront consideration related to the functional intellectual property licenses is recognized when we transfer such license to the customer unless the license is combined with other goods or services into one performance obligation, in which case the revenue is recognized over a period of time based on our estimated pattern in which we satisfy the combined performance obligation. Our licensing agreements are generally cancelable. Customers have the right to terminate their contracts upon notice. We have the right to terminate the contracts generally only if the customer is in breach of the contract and fails to remedy the breach in accordance with the contractual terms.

*Intellectual property sales*

We generate royalty revenue from sales of our intellectual property. We estimate the future royalty payments and recognize revenue with a corresponding contract asset at a point in time when we transfer the intellectual property to the customer. We periodically reassess our estimate of the future royalty payments and recognize any estimate adjustments as revenue in the current period.

*Research, development and regulatory services*

We generate revenue from research, development and regulatory services we provide to our customers in connection with the licensed intellectual property. The services we provide to our customers primarily include scientific research activities, preparation for and management of clinical trials, and assistance during the regulatory approval application process. Revenue associated with these services is recognized based on our estimate of total consideration to be received for such services and the pattern in which we perform the services. The pattern of performance is generally determined to be the amount of incurred expenses reimbursed by the customer as a percentage of total expected reimbursable expenses associated with the contract.

*Product manufacturing*

We generate revenue from manufacturing and clinical supply promises to our customers in connection with securing a supply of drug products for development and clinical trial purposes. The drug products are generally manufactured by our contract manufacturing organizations. We used our product manufacturing facility in Zofingen, Switzerland for a portion of the product manufacturing requirements until we sold the Manufacturing Operations on March 31, 2018 (see Note 2). Revenue associated with product manufacturing obligations is recognized at a point in time as control of the related product is transferred to the customer.

***Contracts with Multiple Performance Obligations.***

Most of our collaboration and license agreements with customers contain multiple promised goods or services. Based on the characteristics of the promised goods and services we analyze whether they are separate or combined performance obligations. The transaction price is allocated to the separate performance obligations on a relative standalone selling price basis. We determine standalone selling price based on our overall pricing and discounting objectives, taking into consideration the type of services, estimates of hourly market rates, and stage of the development and clinical trials.

***Variable Consideration.***

Our contracts with customers primarily include two types of variable consideration: (i) development and regulatory milestone payments, which are due to us upon achievement of specific development and regulatory milestones and (ii) one-time sales-based payments and sales-based royalties associated with sold or licensed intellectual property.

Due to uncertainty associated with achievement of the development and regulatory milestones, the related milestone payments are excluded from the contract consideration and the corresponding revenue is not recognized until we conclude it is probable that reversal of such milestone revenue will not occur.

Product sales-based royalties under licensed intellectual property and one-time payments are accounted for under the royalty exception. We recognize revenue for sales-based royalties under licensed intellectual property and one-time payments at the later of when the sales occur or the performance obligation is satisfied or partially satisfied.

***Disaggregation of Revenue.***

We operate in one reportable business segment. We provide goods and services to our customers in collaboration and license agreements pursuant to various geographical markets. In the following table, revenue is disaggregated by major customers, timing of revenue recognition and revenue classification, in thousands.

| **Customers** | **Three months ended December 31, 2018** | **Year ended December 31, 2018** |
|---|---|---|
| Eisai | $ 1,770 | $ 8,070 |
| Boehringer Ingelheim | 3,663 | 4,448 |
| Outpost Medicine | — | 2,750 |
| Axovant | 1,215 | 2,183 |
| Everest | 2,000 | $ 2,000 |
| Siegfried | — | 942 |
| Other | — | 84 |
| Total | $ 8,648 | $ 20,477 |
| | | |
| **Timing of revenue recognition** | | |
| Revenue recognized at a point in time | $ 7,537 | $ 14,092 |
| Revenue recognized over time | 1,111 | 6,385 |
| Total | $ 8,648 | $ 20,477 |
| | | |
| **Classification** | | |
| Revenue from continuing operations | $ 8,648 | $ 17,970 |
| Revenue reported under discontinued operations | — | 2,507 |
| Total | $ 8,648 | $ 20,477 |

***Contract Assets and Contract Liabilities.***

We receive payments from customers based on contractual terms. Accounts receivable are recorded when the right to consideration becomes unconditional. For research and development services, we generally bill our customers monthly or quarterly as the services are performed. Product sales are generally billed as completed. Payment terms on invoiced amounts are typically 30 days. Contract assets include amounts related to our contractual right to consideration for both completed and partially completed performance obligations that have not been invoiced and for which we do not yet have the right to payment. The current portion of contract asset is included in prepaid expenses and other current assets in the consolidated balance sheet. The non-current portion of contract assets is included in other non-current assets in the consolidated balance sheet. As of January 1, 2018, we recorded a contract asset of $4.1 million, of which $1.4 million was classified as current and $2.7 million was classified as non-current, related to future royalties associated with intellectual property patents previously sold to a customer which do not qualify for the royalty exception in ASC 606. We estimated the amount of the contract asset by applying the expected value method to our estimate of future royalty payments we will receive from this customer. Any future changes to this estimate will be recorded as an adjustment to revenue in the period in which the change in estimate is made.

Contract liabilities consist of deferred revenue and include payments received in advance of performance under the contract.

The following table provides detail of changes in our contract assets and deferred revenues, in thousands. The deferred revenue balances as of December 31, 2017, presented in the following table include balances classified as liabilities of disposal group held for sale:

| | Contract Assets - Current | Contract Assets - Non-Current | Current Portion of Deferred Revenues | Deferred Revenues, Less Current Portion |
|---|---|---|---|---|
| Balances at December 31, 2017 | $ — | $ — | $ 26,560 | $ 1,067 |
| ASC 606 implementation adjustments | 7,527 | 2,694 | (25,526) | (40) |
| Reductions of contract assets | (2,524) | (659) | — | — |
| Impact of the sale of the Manufacturing Operations (see Note 5) | (4,543) | — | — | — |
| Foreign currency translation adjustment | 145 | — | — | — |
| Recognized as revenue during the period | 879 | 2,436 | (1,034) | (1,027) |
| Balances at December 31, 2018 | $ 1,484 | $ 4,471 | $ — | $ — |

***Cost to Obtain and Fulfill a Contract.***

We generally do not incur costs to obtain new contracts. Costs to fulfill contracts are expensed as incurred.

***Remaining Performance Obligations.***

The estimated revenue expected to be recognized in the future related to performance obligations that are unsatisfied (or partially unsatisfied) pursuant to our existing collaboration and license agreements as of December 31, 2018 is immaterial.

Under the royalty exception in ASC 606 for licensed intellectual property we do not recognize any revenue for the variable amounts related to sales-based royalties and milestones until the later of when the sales occur or the performance obligation is satisfied or partially satisfied. Accordingly, the revenue related to future sales-based royalties and milestones are excluded from the estimated revenue expected to be recognized in the future related to performance obligations that are unsatisfied.

***Previous Revenue Recognition Policy***

Prior to January 1, 2018, we recognized revenue when (i) persuasive evidence of an arrangement existed, (ii) delivery had occurred and title had passed, (iii) the price was fixed or determinable and (iv) collectability was reasonably assured. Any advance payments we received in excess of amounts earned were classified as deferred revenues.

We historically evaluated deliverables in a multiple-element arrangement to determine whether each deliverable represents a separate unit of accounting. A deliverable constitutes a separate unit of accounting when it has standalone value to the customer. If the delivered element does not have standalone value without one of the undelivered elements in the arrangement, we combine such elements and account for them as a single unit of accounting. We allocate the consideration to each unit of accounting at the inception of the arrangement based on the relative selling price.

To determine the selling price of a separate deliverable, we used the hierarchy as prescribed in Accounting Standards Codification Topic 605-25 based on vendor-specific objective evidence, or VSOE, third-party evidence, or TPE, or best estimate of selling price, or BESP. VSOE was based on the price charged when the element was sold separately and was the price actually charged for that deliverable. TPE was determined based on third-party evidence for a similar deliverable when sold separately. BESP was the estimated selling price at which we would transact a sale if the elements of collaboration and license arrangements were sold on a stand-alone basis to the buyer.

Non-refundable upfront payments received under our collaboration and license agreements for commercialization rights were deferred if such rights were not deemed to have standalone value without ongoing services which may be required under the agreement. If deferred, such amounts were recognized as revenues on a straight-line basis over the period in which we expected to perform the services.

Amounts we received as reimbursement for our research and development expenditures were recognized as revenue as the services are performed.

Under the milestone method, we recognized revenue that was contingent upon the achievement of a substantive milestone in its entirety in the period in which the milestone was achieved. A milestone is an event (i) that can be achieved in whole or in part on either our performance or on the occurrence of a specific outcome resulting from our performance, (ii) for which there is substantive uncertainty at the date the arrangement is entered into that the event will be achieved and (iii) that would result in additional payments being due us. A milestone payment is considered substantive when the consideration payable to us for each milestone (a) is consistent with our performance necessary to achieve the milestone or the increase in value to the collaboration resulting from our performance, (b) relates solely to our past performance and (c) is reasonable relative to all of the other deliverables and payments under the arrangement. In making this assessment, we considered all facts and circumstances relevant to the arrangement, including factors such as the scientific, regulatory, commercial and other risks that must be overcome to achieve the respective milestone, the level of effort and investment required to achieve the respective milestone and whether any portion of the milestone consideration is related to future performance or deliverables. Other contingent-based payments received were recognized when earned.

**Research and Development Expenses**

Research and development expenses, which consist primarily of salaries and other personnel costs, clinical trial costs and preclinical study fees, manufacturing costs for non-commercial products, and the development of earlier-stage programs and technologies, are expensed as incurred when these expenditures have no alternative future uses.

We accrue clinical trial expenses based on work performed. In determining the amount to accrue, we rely on estimates of total costs incurred based on enrollment, the completion of trials and other events. We follow this method because we believe reasonably dependable estimates of the costs applicable to various stages of a clinical trial can be made. However, the actual costs and timing of clinical trials are uncertain, subject to risks and may change depending on a number of factors. Differences between the actual clinical trial costs and the estimated clinical trial costs that we have accrued in any prior period are recognized in the subsequent period in which the actual costs become known. Historically, these differences have not been material; however, material differences could occur in the future. Payments made to reimburse collaborators for our share of their research and development activities are recorded as research and development expenses, and are recognized as the work is performed.

**Comprehensive Loss**

Comprehensive loss is defined as the change in equity during a period from transactions and other events and circumstances from non-owner sources. We report components of comprehensive loss in the period in which they are recognized. For the years ended December 31, 2018 and 2017, comprehensive loss consisted of net loss, foreign currency translation gains and losses, and unrealized gains and losses related to available-for-sale investments. For the year ended 2016, comprehensive loss consisted of net loss and foreign currency translation gains and losses.

**Income (Loss) Per Share**

We calculate basic and diluted loss from continuing operations, income (loss) from discontinued operations and net loss per share using the weighted-average number of shares of common stock outstanding during the period.

Since we have a loss from continuing operations for the years ended December 31, 2018, 2017, and 2016, in addition to excluding potentially dilutive out-of-the money securities, we have excluded from our calculation of income (loss) per share all potentially dilutive in-the-money (i) stock options, (ii) restricted stock unit awards, or RSUs, (iii) Total Stockholder Return, or TSR, performance restricted stock unit, or PRSU, awards, and (iv) unvested restricted stock in our deferred compensation plan, and our diluted net loss per share is the same as our basic net loss per share. The table below presents the weighted-average number of potentially dilutive securities that were excluded from our calculation of diluted income (loss) per share for the years presented, in thousands.

| | Years ended December 31, | | |
|---|---|---|---|
| | 2018 | 2017 | 2016 |
| Stock options | 5,835 | 3,664 | 2,495 |
| RSUs and unvested restricted stock | 20 | 3 | 21 |
| Total | 5,855 | 3,667 | 2,516 |

Because the market condition for the PRSUs was not satisfied at December 31, 2017, and 2016, such securities are excluded from the table above.

**Income Taxes**

We use the asset and liability method of accounting for income taxes. Deferred tax assets and liabilities are recognized for the estimated future tax consequences attributable to differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax bases. Our deferred tax assets and liabilities are determined using the enacted tax rates expected to be in effect for the years in which those tax assets are expected to be realized.

The realization of our deferred tax assets is dependent upon our ability to generate sufficient future taxable income. We establish a valuation allowance when it is more-likely-than-not the future realization of all or some of the deferred tax assets will not be achieved. The evaluation of the need for a valuation allowance is performed on a jurisdiction-by-jurisdiction basis, and includes a review of all available evidence, both positive and negative.

The impact of an uncertain income tax position is recognized at the largest amount that is more-likely-than-not to be sustained upon audit by the relevant taxing authority. An uncertain income tax position will not be recognized if it has less than a 50% likelihood of being sustained.

**2. Fair Value Disclosures**

We measure our financial assets and liabilities at fair value, which is defined as the exit price, or the amount that would be received from selling an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date.

We use the following three-level valuation hierarchy that maximizes the use of observable inputs and minimizes the use of unobservable inputs to value our financial assets and liabilities:

Level 1 - Observable inputs such as unadjusted quoted prices in active markets for identical instruments.

Level 2 - Quoted prices for similar instruments in active markets or inputs that are observable for the asset or liability, either directly or indirectly.

Level 3 - Significant unobservable inputs based on our assumptions.

The following tables present our valuation hierarchy for our financial assets and liabilities that are measured at fair value on a recurring basis, in thousands:

| | Fair Value Measurements at December 31, 2018 | | | |
|---|---|---|---|---|
| | Balance | Quoted Prices in Active Markets (Level 1) | Significant Other Observable Inputs (Level 2) | Significant Unobservable Inputs (Level 3) |
| *Assets:* | | | | |
| Money market funds(1) | $ 62,438 | $ 62,438 | $ — | $ — |
| US government and government agency notes(2) | 171,278 | 171,278 | — | — |
| Corporate debt instruments(2) | 240,481 | — | 240,481 | — |

| | Fair Value Measurements at December 31, 2017 | | | |
|---|---|---|---|---|
| | Balance | Quoted Prices in Active Markets (Level 1) | Significant Other Observable Inputs (Level 2) | Significant Unobservable Inputs (Level 3) |
| *Assets:* | | | | |
| Money market funds(1) | $ 48,750 | $ 48,750 | $ — | $ — |
| US government and government agency notes(2) | 50,335 | 50,335 | — | — |
| Corporate debt instruments(2) | 94,639 | — | 94,639 | — |

(1) Included in cash and cash equivalents in the accompanying consolidated balance sheets.
(2) Included in either cash and cash equivalents or available-for-sale investments in the accompanying consolidated balance sheet.

**3. Investments, Available-for-Sale**

Investments, available-for-sale, consisted of the following, in thousands:

| December 31, 2018 | Maturity in years | Amortized Cost | Gross Unrealized Gains | Gross Unrealized Losses | Estimated Fair Value |
|---|---|---|---|---|---|
| US government and government agency notes | Less than 1 | $ 139,274 | $ — | $ (18) | $ 139,256 |
| Corporate debt securities | Less than 1 | 145,468 | — | (130) | 145,338 |
| Short-term investments, available-for-sale | | $ 284,742 | $ — | $ (148) | $ 284,594 |
| | | | | | |
| US government and government agency notes | 1 - 5 | $ 16,998 | $ 6 | $ — | $ 17,004 |
| Corporate debt securities | 1 - 5 | 65,512 | — | (104) | 65,408 |
| Investments, available-for-sale | | $ 82,510 | $ 6 | $ (104) | $ 82,412 |

| December 31, 2017 | Maturity in years | Amortized Cost | Gross Unrealized Gains | Gross Unrealized Losses | Estimated Fair Value |
|---|---|---|---|---|---|
| US government and government agency notes | Less than 1 | $ 34,873 | $ — | $ (8) | $ 34,865 |
| Corporate debt securities | Less than 1 | 53,438 | — | (63) | 53,375 |
| Short-term investments, available-for-sale | | $ 88,311 | $ — | $ (71) | $ 88,240 |
| | | | | | |
| Corporate debt securities | 1 - 5 | $ 24,304 | $ — | $ (62) | $ 24,242 |
| Investments, available-for-sale | | $ 24,304 | $ — | $ (62) | $ 24,242 |

**4. Balance Sheet Details**

Land, property and equipment, net consisted of the following, in thousands:

| | December 31, | |
|---|---|---|
| | 2018 | 2017 |
| Land | $ 4,950 | $ 7,650 |
| Building and capital improvements | 45,246 | 54,584 |
| Leasehold improvements | 14,915 | 17,769 |
| Machinery and equipment | 173 | 1,737 |
| Computers and software | 3,083 | 4,890 |
| Furniture and office equipment | 1,175 | 1,614 |
| | 69,542 | 88,244 |
| Less accumulated depreciation and amortization | (46,428) | (58,113) |
| Land, property and equipment, net | $ 23,114 | $ 30,131 |

As of December 31, 2018, substantially all of our long-lived assets are located in the United States.

Accounts payable and other accrued liabilities consisted of the following, in thousands:

| | December 31, | |
|---|---|---|
| | 2018 | 2017 |
| Accounts payable | $ 6,192 | $ 1,599 |
| Accrued compensation | 8,622 | 5,255 |
| Other accrued liabilities | 1,367 | 1,062 |
| Total accounts payable and other accrued liabilities | $ 16,181 | $ 7,916 |

**5. Sale of Manufacturing Operations**

In order to further focus our efforts and resources on our strategic objectives of developing our pipeline drug candidates, in March 2018, we entered into an Asset Purchase Agreement, or Sale Agreement, with Siegfried Pharma AG and Siegfried AG, (collectively and individually, Siegfried). Under the Sale Agreement, we agreed to sell and assign to Siegfried, and Siegfried agreed to purchase and assume from Arena GmbH, certain drug product finishing facility assets and know-how, including fixtures, equipment, other personal property and real estate assets located in Zofingen, Switzerland and related contracts and certain related liabilities, or collectively, the Manufacturing Operations. We refer to this transaction as the Siegfried Transaction. The Siegfried Transaction was completed on March 31, 2018. In connection with the Siegfried Transaction, all of Arena GmbH's approximately 50 employees transferred to Siegfried. We have excluded from our continuing operations for all periods presented in this report revenues and expenses associated with the disposed Manufacturing Operations, which are reported as discontinued operations. The total sales price for the Manufacturing Operations was approximately CHF 4 million of which approximately CHF 3 million was received in cash in March 2018 with the remaining portion to be received in March 2019, net of any qualifying claims by Siegfried.

We have retrospectively revised the consolidated statements of operations and cash flows for the year ended December 31, 2016 to reflect the operations and cash flows of the Manufacturing Operations as discontinued operations.

The following table summarizes the results of discontinued operations for the periods presented in the consolidated statements of operations for the years ended December 31, 2018, 2017, and 2016, in thousands:

| | Years ended December 31, | | |
|---|---|---|---|
| **Revenues** | **2018** | **2017** | **2016** |
| Net product sales | $ 1,129 | $ 9,189 | $ 26,349 |
| Other collaboration revenue | 372 | 6,671 | 1,334 |
| Toll manufacturing | 1,006 | 3,179 | 4,129 |
| Total revenues | 2,507 | 19,039 | 31,812 |
| **Operating costs and expenses** | | | |
| Cost of product sales | 1,858 | 7,472 | 9,297 |
| Cost of toll manufacturing | 1,411 | 4,756 | 6,044 |
| Research and development | — | 643 | 2,643 |
| General and administrative | 329 | 1,672 | 3,714 |
| Impairment of long-lived assets | — | — | 21,766 |
| Restructuring charges | — | — | 231 |
| Other (income) expense, net | 464 | 1,374 | (1,287) |
| Total costs and expenses | 4,062 | 15,917 | 42,408 |
| Income (loss) from operations of discontinued operations | (1,555) | 3,122 | (10,596) |
| Gain on sale of discontinued operations | 725 | — | — |
| Income (loss) from discontinued operations | $ (830) | $ 3,122 | $ (10,596) |

The following table summarizes the assets and liabilities of the Manufacturing Operations which were classified as held for sale as of December 31, 2017, in thousands:

| | December 31, 2017 |
|---|---|
| **Assets** | |
| Current assets: | |
| Accounts receivable | $ 813 |
| Inventories | 6,949 |
| Prepaid expenses and other current assets | 634 |
| Total current assets | 8,396 |
| Land, property and equipment, net | 7,511 |
| Intangible assets, net | 1,233 |
| Total non-current assets(1) | 8,744 |
| Total assets of disposal group held for sale | $ 17,140 |
| **Liabilities** | |
| Current liabilities: | |
| Accounts payable and other accrued liabilities | $ 2,145 |
| Deferred revenues | 25,450 |
| Total liabilities of disposal group held for sale | $ 27,595 |

(1) The assets and liabilities of the Manufacturing Operations classified as held for sale are classified as current in the consolidated balance sheet at December 31, 2017, because it was probable that the sale would occur and proceeds would be collected within one year.

**6. Commitments**

We have three properties in California under sale and leaseback agreements. The terms of these leases stipulate annual increases in monthly rental payments of 2.5%. We account for our sale and leaseback transactions using the financing method. Under the financing method, the book value of the properties and related accumulated depreciation remain on our balance sheet and no sale is recognized. The sales price of the properties is recorded as a financing obligation, and a portion of each lease payment is recorded as interest expense. We recorded interest expense of $5.7 million, $6.1 million, and $6.4 million for the years ended December 31, 2018, 2017, and 2016, respectively, related to these leases. We expect interest expense related to our facilities to total $26.0 million from December 31, 2018, through the remaining terms of the leases in fiscal year 2027. At December 31, 2018, the total financing obligation for these facilities was $52.7 million. The aggregate residual value of the facilities at the end of the lease terms is $5.0 million.

We lease an additional property in California under an operating lease, which expires in May 2027, and contains a purchase option and stipulates annual increases in monthly rental payments of 2.5%. We also lease office space in Zug, Switzerland under an operating lease which expires in September 2020 and office space in Boston, Massachusetts under a short-term lease.

In accordance with the lease terms for certain of our properties, we are required to maintain deposits for the benefit of the landlord throughout the term of the leases. A total of $0.7 million and $0.7 million were recorded in other non-current assets in our consolidated balance sheets at December 31, 2018, and 2017, respectively, related to such leases.

We recognize rent expense on a straight-line basis over the term of each lease. Rent expense of $1.2 million, $1.5 million and $1.2 million was recognized for the years ended December 31, 2018, 2017, and 2016, respectively.

At December 31, 2018, the future minimum lease payments under our existing financing and operating lease obligations are as follows, in thousands:

| Year ending December 31, | Financing Obligations | Operating Leases |
|---|---|---|
| 2019 | $ 7,391 | $ 1,050 |
| 2020 | 8,254 | 1,100 |
| 2021 | 8,461 | 976 |
| 2022 | 8,672 | 1,000 |
| 2023 | 8,889 | 1,025 |
| Thereafter | 32,052 | 3,698 |
| Total minimum lease payments | 73,719 | $ 8,849 |
| Less amounts representing interest | (25,960) | |
| Add amounts representing residual value | 4,950 | |
| Lease financing obligations | 52,709 | |
| Less current portion | (3,283) | |
| | $ 49,426 | |

In 2016, we entered into agreements to sublease several of our California properties including an agreement to sublease one of our properties to Beacon. In 2017, we entered into an agreement to sublease another of our California properties. All our subleases expire in May 2027. The terms of the subleases stipulate annual increases in monthly rental payments.

We recognize rent income on a straight-line basis over the term of the subleases. Expected minimum rental payments to be received under the sublease are as follows:

| Year ending December 31, | |
|---|---|
| 2019 | $ 1,520 |
| 2020 | 1,873 |
| 2021 | 2,477 |
| 2022 | 3,487 |
| 2023 | 3,794 |
| Thereafter | 13,735 |
| Total | $ 26,886 |

**7. Stockholders' Equity**

In March 2018, we completed the sale of an aggregate of 9,775,000 shares of our common stock under an underwritten public offering. Net proceeds from the offering were approximately $383.1 million after deducting underwriting discounts and commissions and offering expenses payable by us.

In July 2017, we completed the sale of an additional 7,187,500 shares of our common stock under an underwritten public offering. Net proceeds from the offering were $162.0 million after deducting underwriting discounts and commissions, and offering expenses payable by us.

In April 2017, we completed the sale of an aggregate of 6,900,000 shares of our common stock under an underwritten public offering. Net proceeds from the offering were approximately $74.4 million after deducting underwriting discounts and commissions, and offering expenses payable by us.

In January 2017, we entered into an Equity Distribution Agreement, or ATM, with Citigroup Global Markets, Inc., or the Sales Agent, under which we may offer and sell common stock having an aggregate offering price of up to $50.0 million from time to time though our Sales Agent. Sales of the shares under the ATM were made in transactions that are deemed to be "at-the-market" equity offerings as defined in Rule 415 under the Securities Act of 1933, as amended, including sales made by means of ordinary brokers' transactions, including on the Nasdaq Stock Market. During the period from February through April 2017, we sold 489,023 shares of our common stock at an average market price of $15.05 per share under the ATM for aggregate net proceeds of approximately $7.0 million after deducting commissions and expenses.

**Equity Compensation Plans.**

In June 2017, our stockholders approved our 2017 Long-Term Incentive Plan, or 2017 LTIP. Upon such approval, our 2013 Long-Term Incentive Plan, or 2013 LTIP, was terminated. Notwithstanding such termination or the previous termination of our 2012 Long-Term Incentive Plan, 2009 Long-Term Incentive Plan, and 2006 Long-Term Incentive Plan, as amended, or, together with the 2013 LTIP, the Prior Plans, all outstanding awards under the Prior Plans continue to be governed under the terms of the Prior Plans. In June 2018, our stockholders approved amendment and restatement of our 2017 Long-Term Incentive Plan, to, among other things, increase the number of shares authorized for issuance under the 2017 LTIP. The number of shares of common stock authorized for issuance under the 2017 LTIP may be increased by the number of shares subject to any stock awards under the Prior Plans that are forfeited, expire or otherwise terminate without the issuance of such shares and would otherwise be returned to the share reserve under the Prior Plans but for their termination and as otherwise provided in the 2017 LTIP.

The aggregate number of shares of our common stock that initially may be issued pursuant to stock awards granted under the 2017 LTIP is 6,958,560 shares, less 1 share for every share that was subject to an option or stock appreciation right granted under the 2017 Plan and 1.9 shares for every 1 share that share that was subject to an award other than an option or stock appreciation right granted under the 2017 LTIP after March 31, 2018. Shares issued pursuant to the exercise of stock options and stock appreciation rights granted under the 2017 LTIP reduce the available number of shares by 1 share for every share issued while awards other than stock options and stock appreciation rights granted under the 2017 LTIP reduce the available number of shares by 1.9 shares for every share issued.

Shares under the 2017 LTIP may be granted as incentive stock options, nonstatutory stock options, stock appreciation rights, restricted stock awards, restricted stock unit awards and performance awards. Performance awards may be based on the achievement of operational, financial, research and development, collaboration and license arrangements and other performance metrics provided under the 2017 LTIP, such as total stockholder return, revenue, research, development and regulatory achievements and strategic and operational initiatives.

Stock options granted under the 2017 LTIP generally vest over four years with 25% of the shares subject to each option vesting on the first anniversary of the grant date and the remainder of the shares vesting monthly over the following three years in equal installments and, to the extent vested, are exercisable for up to seven years from the date of grant. The recipient of a restricted stock award has all rights of a stockholder at the date of grant, subject to certain restrictions on transferability and a risk of forfeiture. Restricted stock unit awards generally vest over one or four years from the date of grant. The minimum performance period under a performance award is 12 months. Neither the exercise price of an option nor the grant price of a stock appreciation right may be less than 100% of the fair market value of the common stock on the date such equity award is granted, except in specified situations. The 2017 LTIP prohibits option and stock appreciation right repricings (other than to reflect stock splits, spin-offs or certain other corporate events) without stockholder approval.

The following table summarizes our stock option activity under the Prior Plans and the 2017 LTIP, or collectively, our Equity Compensation Plans, for the year ended December 31, 2018, in thousands (except per share data):

| | Options | Weighted-Average Exercise Price | Weighted-Average Remaining Contractual Term (in years) | Aggregate Intrinsic Value |
|---|---|---|---|---|
| Outstanding at December 31, 2017 | 3,755 | $ 20.00 | | |
| Granted | 3,514 | $ 38.00 | | |
| Exercised | (318) | $ 18.54 | | |
| Forfeited/cancelled/expired | (410) | $ 34.53 | | |
| Outstanding at December 31, 2018 | 6,541 | $ 28.83 | 5.47 | $ 75,149 |
| Vested and expected to vest at December 31, 2018 | 6,541 | $ 28.83 | 5.47 | $ 75,149 |
| Vested and exercisable at December 31, 2018 | 1,808 | $ 21.01 | 4.29 | $ 36,698 |

The aggregate intrinsic value in the above table is calculated as the difference between the closing price of our common stock at December 31, 2018, of $38.95 per share and the exercise price of stock options that had strike prices below the closing price. The intrinsic value of all stock options exercised during the years ended December 31, 2018, 2017, and 2016, was $7.1 million, $2.8 million, and $0.1 million, respectively. During the year ended December 31, 2018, cash of $5.9 million was received from stock option exercises. There is no tax impact related to share-based compensation or stock option exercises because we are in a net operating loss position with a full valuation allowance on our deferred tax assets.

In March 2015, March 2014 and March 2013, we granted our executive officers PRSU awards. The PRSUs may be earned and converted into outstanding shares of our common stock based on the TSR of our common stock relative to the TSR over a three-year performance period beginning March 1 of the year granted of the Nasdaq Biotechnology Index. In the aggregate, the target number of shares of common stock that could be earned under the PRSUs granted in March 2015, March 2014 and March 2013 were originally 74,500, 69,500 and 78,000, respectively; however, the actual number of shares that could be earned ranges from 0% to 200% of such amounts. In addition, there is a cap on the number of shares that could be earned under the PRSUs equal to six times the grant-date fair value of each award, and funding is capped at 100% if the absolute 3-year TSR is negative even if performance is above the median. As these awards contain a market condition, we used a Monte Carlo simulation model to estimate the grant-date fair value, which totaled $3.4 million, $5.0 million and $5.9 million for the March 2015, 2014 and March 2013 grants, respectively. The grant-date fair value is recognized as compensation expense over the performance period as service is provided; no compensation expense is recognized for service not provided in case of separation from the Company. There is no adjustment of compensation expense recognized for service performed regardless of the number of PRSUs, if any, that ultimately vest.

In February 2016, the remaining PRSUs granted in March 2013 were forfeited without any earnout based on the TSR of our common stock relative to the TSR of the Nasdaq Biotechnology Index over the three-year performance period that began on March 1, 2013. In February 2017, the remaining PRSUs granted in March 2014 were forfeited without any earnout based on the TSR of our common stock relative to the TSR Nasdaq Biotechnology Index over the three-year performance period that began on March 1, 2014. In March 2018, 32,322 shares were issued to the holders of the remaining PRSUs granted in March 2015 based on the TSR of our common stock relative to the TSR Nasdaq Biotechnology Index over the three-year performance period that began on March 1, 2015.

Subsequent to December 31, 2018, we granted an additional stock options and PRSUs to our employees under the 2017 LTIP.

**Employee Stock Purchase Plan.**

In June 2015, our stockholders approved our 2009 Employee Stock Purchase Plan, as amended, or 2009 ESPP. Under the 2009 ESPP substantially all employees could choose to have up to 15% of their annual compensation withheld to purchase up to 625 shares of our common stock per purchase period, subject to certain limitations. The shares of our common stock could be purchased over an offering period with a maximum duration of 24 months and at a price of not less than 85% of the lesser of the fair market value of the common stock on (i) the first trading day of the applicable offering period or (ii) the last trading day of the applicable three-month purchase period. Under applicable accounting guidance, the 2009 ESPP was considered a compensatory plan. The 2009 ESPP was terminated in June 2017.

During the years ended December 31, 2017, and 2016, a total of 2,236 and 14,140 shares, respectively, were purchased by our employees under the 2009 ESPP.

**Share-based Compensation.**

We estimate the grant-date fair value of all of our share-based awards in determining our share-based compensation expense. Our share-based awards include stock options, options to purchase stock granted under our employee stock purchase plan, RSUs, and PRSU awards.

The table below sets forth the weighted-average assumptions and estimated fair value of stock options we granted under our Equity Compensation Plans during the years presented:

| | Years ended December 31, | | |
|---|---|---|---|
| | 2018 | 2017 | 2016 |
| Risk-free interest rate | 2.6% | 1.9% | 1.4% |
| Dividend yield | 0% | 0% | 0% |
| Expected volatility | 63% | 69% | 79% |
| Expected life (years) | 4.58 | 4.58 | 4.81 |
| Weighted-average estimated fair value per share of stock options granted | $ 20.01 | $ 9.17 | $ 10.17 |

We recognized share-based compensation expense as follows for the years presented, in thousands, except per share data:

| | Years ended December 31, | | |
|---|---|---|---|
| | 2018 | 2017 | 2016 |
| Research and development | $ 8,385 | $ 1,945 | $ 5,596 |
| General and administrative | 11,158 | 5,925 | 4,447 |
| Restructuring charges | — | — | 1,032 |
| Discontinued operations | 11 | 120 | 42 |
| Total share-based compensation expense | $ 19,554 | $ 7,990 | $ 11,117 |
| Impact on net loss per share, basic and diluted | $ 0.42 | $ 0.24 | $ 0.46 |

The table below sets forth our total unrecognized estimated compensation expense at December 31, 2018, by type of award and the weighted-average remaining requisite service period over which such expense is expected to be recognized:

| | Unrecognized Expense (in thousands) | Remaining Weighted-Average Recognition Period (in years) |
|---|---|---|
| Unvested stock options | $ 65,069 | 2.86 |
| RSUs | 626 | 0.71 |

**Common Stock Reserved for Future Issuance.**

A total of 12,491,648 shares of our common stock were reserved for future issuance at December 31, 2018, pursuant to our Equity Compensation Plans.

**8. Collaborations and License Agreements**

**Everest.**

In December 2017, we and Everest entered into an exclusive agreement, or the Everest Agreement, to conduct joint development for the ralinepag and etrasimod programs. Under the Everest Agreement, we granted Everest an exclusive, royalty-bearing license to develop and commercialize ralinepag (in any formulation) and etrasimod (in oral formulations), in mainland China, Taiwan, Hong Kong, Macau and South Korea, or collectively, the Territories. Everest is generally responsible for development and commercialization of the licensed products in the Territories, and may participate in the portion of our global clinical trials that is conducted in the Territories. In January 2019, we and Everest amended the Everest Agreement by entering into two separate agreements, one for each development program with the terms identical to the original Everest Agreement. Under the United Therapeutics Agreement described in Note 1, we assigned all our rights and obligations with respect to the ralinepag program under the Everest Agreement, to United Therapeutics.

In connection with entering into the Everest Agreement, we received from Everest an upfront payment of $12.0 million in December 2017. We are also eligible to receive up to an aggregate of $115.0 million in success milestones in case of full commercial success of etrasimod products. We are also eligible to receive tiered royalties on net sales of etrasimod products in the Territories.

The promised goods and services under the Everest Agreement are accounted for as a single performance obligation consisting of a development and commercialization license. The amount of the upfront payment was recognized as revenue in December 2017 as we determined (i) that the license is a deliverable with standalone value to Everest and (ii) the upfront payment represents consideration to be allocated to the delivered license. In the fourth quarter of 2018, the Chinese National Medical Products Administration accepted the initial clinical trial applications for etrasimod and the oral formulation of ralinepag. Under the terms of the Everest Agreement, we recognized revenue of $2.0 million from the achievement of these milestones. As of December 31, 2018, all future potential milestone payments were excluded from the estimated total transaction price as they are considered constrained.

**Eisai.**

In July 2010, we granted Eisai exclusive commercialization rights for lorcaserin (marketed as BELVIQ/BELVIQ XR) solely in the United States and its territories and possessions. In May 2012, we and Eisai entered into the first amended and restated agreement, which expanded Eisai's exclusive commercialization rights to include most of North and South America. In November 2013, we and Eisai entered into the second amended and restated agreement, or Second Amended Agreement, which expanded Eisai's exclusive commercialization rights for lorcaserin to all countries in the world, except for South Korea, Taiwan, Australia, New Zealand and Israel.

In December 2016, we and Eisai amended and restated the terms of marketing and supply agreement for lorcaserin with Eisai by entering into a Transaction Agreement and a Supply Agreement (collectively, the Eisai Agreement) with Eisai. Under the Transaction Agreement, Eisai acquired an exclusive royalty-bearing license or transfer of intellectual property to global commercialization and manufacturing rights to lorcaserin, including in the territories retained by us under the prior agreement, with control over global development and commercialization decisions. Eisai is responsible for all lorcaserin development expenses in the future. We also assigned to Eisai our rights under the commercial lorcaserin distribution agreements with Ildong Pharmaceutical Co., Ltd., or Ildong, for South Korea; CY Biotech Company Limited, or CYB, for Taiwan; and Teva Pharmaceuticals Ltd.'s Israeli subsidiary, Abic Marketing Limited, or Teva, for Israel.

Under the Supply Agreement, Eisai paid us $10.0 million in December 2016 to acquire our entire on-hand inventory of bulk lorcaserin and the precursor material for manufacturing lorcaserin. Eisai also paid us for finished drug product plus monthly manufacturing support payments through March 2018 totaling CHF 8.7 million.

Until March 31, 2018, when we sold the Manufacturing Operations, including the assignment of the Supply Agreement, to Siegfried (see Note 5), we manufactured lorcaserin at our manufacturing facility in Zofingen, Switzerland. Revenues earned for (i) lorcaserin sold by us to Eisai under the manufacturing and supply commitment within the Supply Agreement and (ii) the manufacturing support payments are classified within discontinued operations as part of the Manufacturing Operations in the consolidated statements of operations (see Note 5). All other revenues earned under the Transaction Agreement, such as royalties, are classified within continuing operations in the consolidated statements of operations.

*Royalty payments.*

Pursuant to the Transaction Agreement, we are eligible to receive royalty payments from Eisai based on the global net sales of lorcaserin. The royalty rates are as follows:

- 9.5% on annual net sales less than or equal to $175.0 million
- 13.5% on annual net sales greater than $175.0 million but less than or equal to $500.0 million
- 18.5% of annual net sales greater than $500.0 million

*Upfront payments.*

Prior to the Transaction Agreement, we received from Eisai total upfront payments of $115.0 million under prior lorcaserin collaboration agreements and $7.5 million from the prior commercial lorcaserin distribution agreements with Ildong and CYB described below, and Teva. Revenues from these upfront payments were previously deferred, as we determined that the exclusive rights did not have standalone value without our ongoing development and regulatory activities. Accordingly, these payments were recognized ratably as revenue over the periods in which we expected the services to be rendered. The Transaction Agreement effectively eliminated our obligation to continue performing the development and regulatory activities required in the original agreement, which resulted in acceleration of upfront payment revenue recognition in 2016. For the year ended December 31, 2016, we recognized revenue of $66.0 million related to these upfront payments.

*Milestone payments.*

For the year ended December 31, 2016, we recognized revenue of $12.0 million related to the following milestone payments from our Second Amended Agreement with Eisai.

In July 2016, the US Food and Drug Administration, or FDA, approved the New Drug Application for BELVIQ XR. We earned from Eisai a $10.0 million substantive milestone payment from this achievement. In October 2016, Eisai announced the commercial launch of BELVIQ XR in the United States.

In July 2016, the Federal Commission for the Protection Against Sanitary Risk approved the Marketing Authorization Application in Mexico for our twice-daily formulation of lorcaserin for chronic weight management. We earned from Eisai a $1.0 million substantive milestone payment from this achievement.

In December 2016, the Brazilian Health Surveillance Agency provided regulatory approval in Brazil for BELVIQ. We earned from Eisai a $1.0 million substantive milestone payment from this achievement.

In total, prior to the Transaction Agreement, we received a total of $102.1 million in milestone payments from Eisai, Ildong, CYB, and Teva. These payments were recognized as revenue upon the achievement of the milestones. We are eligible to receive an additional substantive commercial milestone of $25.0 million upon the achievement of global net sales of lorcaserin for a calendar year first exceeding $250.0 million.

*Accounting for Eisai Agreement under ASC 606.*

Upon implementation of ASC 606 on January 1, 2018, we applied a practical expedient for contract modifications applicable to contracts that were modified before the implementation date. The promised goods and services under the Eisai Agreement were assessed in combination with promised goods and services under our previous agreements with Eisai and commercial lorcaserin distribution agreements with Ildong, CYB, and Teva. The total estimated transaction price of these contracts at the implementation date was $344.4 million, which included previously received upfront payments, milestone payments, proceeds from net products sales, reimbursement of development expenses, reimbursement of patent expenses, manufacturing support payments received and expected to be received under the Supply Agreement, proceeds from the sale of on-hand inventory of bulk lorcaserin and the precursor material, royalty payments received through December 31, 2017, and estimated future royalty payments related to intellectual property sold to Eisai. The future potential milestone payments were excluded from the estimated total transaction price as they are considered constrained due to our assessment of the probability of a significant revenue reversal. The future royalties related to licensed intellectual property were excluded from the estimated total transaction price under the royalty exception in ASC 606. The estimated future royalties that relate to intellectual property sold to Eisai do not qualify for the royalty exception in ASC 606 and were included in the estimated total transaction price.

The estimated total transaction price was allocated between satisfied and unsatisfied performance obligations based on the relative standalone selling prices of the identified performance obligations. The remaining manufacturing and supply obligations under the Supply Agreement was the only unsatisfied performance obligation. As a result of this allocation, on January 1, 2018, we reduced the balance of deferred revenues associated with the Eisai Agreement at the implementation date by $25.5 million, recognized a contract asset of $6.1 million related to future manufacturing support payments under the Supply Agreement and recognized a contract asset of $4.1 million related to estimated future royalty payments from intellectual property sold to Eisai under the Transaction Agreement. In connection with the sale of the Manufacturing Operations on March 31, 2018, we derecognized the remaining portion of the contract asset associated with the Supply Agreement. During 2018, we adjusted our estimate of future royalty payments from intellectual property sold to Eisai under the Transaction Agreement based on the positive CVOT study results reported by Eisai and our estimate of the qualifying sales of BELVIQ in the future years and recorded associated royalty revenue and an increase to the contract asset of $3.3 million.

Based on the bill-and-hold accounting guidance in ASC 606, effective January 1, 2018, we derecognized $3.6 million of inventory of bulk lorcaserin and the precursor material previously sold to Eisai for which the revenue recognition criteria were met on the implementation date under ASC 606.

For the years ended December 31, 2018 and 2017, we recorded royalty revenue of $6.6 million and $1.7 million, respectively related to the Transaction Agreement. For the year ended December 31, 2018 and 2017, we recognized revenue of $1.5 million and $15.9 million, respectively, related to the Supply Agreement (classified under discontinued operations), all of which was recorded during the first quarter of 2018 and primarily consisting of net product sales and other collaboration revenue.

*Accounting for Eisai Agreement under previous revenue recognition policy.*

The total arrangement consideration of $115.6 million primarily consists of (i) the December 28, 2016, balances of deferred revenues from the upfront payments received under the prior Eisai agreements and the distribution agreements with Ildong, CYB and Teva; (ii) the $10.0 million payment received from Eisai on December 28, 2016; and (iii) the product purchase payments and manufacturing support payments we expect to receive from Eisai for the initial two-year manufacturing and supply commitment period.

All of the deliverables were determined to have standalone value and to meet the criteria to be accounted for as separate units of accounting. Factors considered in the determination included, among other things, for the license, the manufacturing experience and capabilities of Eisai and their sublicense rights, and for the remaining deliverables the fact that they are not proprietary and can be provided by other vendors. The total arrangement consideration was allocated to the units of accounting on the basis of their relative estimated selling prices as follows:

- $64.0 million was allocated to the License Deliverable. As the License Deliverable was delivered on December 28, 2016, this amount was recognized as collaboration revenue of continuing operations for the year ended December 31, 2016.

- $30.8 million was allocated to the Inventory Deliverable. Title to this entire inventory passed to Eisai on December 28, 2016. However, none of this inventory was physically transferred from the manufacturing facility on that date. There is no fixed schedule for delivery given a portion has been and will be delivered on a continuous basis as we perform under the manufacturing commitment, another portion has been and will be physically transferred to Eisai upon request by Eisai and the rest is expected to be physically transferred at the end of the manufacturing and supply commitment period. Also, the risks of ownership for this inventory did not pass to Eisai in 2016 as we have financial responsibility for loss, damage or destruction which occurs while in our possession. Therefore, none of the arrangement consideration allocated to this deliverable was recognized as revenue and none of the carrying value of this inventory was recognized as cost of product sales for the year ended December 31, 2016. For the year ended December 31, 2017, we recognized $6.4 million as revenue of discontinued operations related to this deliverable and $0.9 million of the carrying value of this inventory as cost of product sales of discontinued operations.
- $20.8 million was allocated to the Manufacturing and Supply Commitment Deliverable. This deliverable was provided over 2017 and 2018 as product was shipped to Eisai until March 31, 2018. Therefore, none of the arrangement consideration allocated to this deliverable was recognized as revenue for the year ended December 31, 2016. For the year ended December 31, 2017, we recognized $9.5 million as revenue of discontinued operations related to this deliverable.

The estimated selling price represents the price at which we would contract if the deliverable was sold regularly on a standalone basis. The estimated selling price for each unit of accounting was determined as follows:

- The estimated selling price for the License Deliverable was determined using an income approach that estimates the net present value of royalties Eisai is expected to earn under the Eisai Agreement as compared to the Second Amended Agreement, net of the development costs we are no longer obligated to spend. This model includes several assumptions, including the potential market for lorcaserin in each relevant jurisdiction, probabilities of obtaining regulatory approval in additional jurisdictions, the impact of competition, the potential impact of Eisai's ongoing development and regulatory activities related to lorcaserin, and the appropriate discount rate.
- The estimated selling price for the Inventory Deliverable was determined by considering the historical cost of the precursor materials, adjusted for any changes in market condition and supplier relationships. We believe that the Eisai Agreement pricing represents pricing that would be charged if it were sold on a standalone basis.
- The estimated selling price for the Manufacturing and Supply Commitment Deliverable was determined to be the aggregate product purchase payments we expect to receive from Eisai for the initial two-year manufacturing and supply commitment period. As noted above, we believe that the Eisai Agreement pricing represents pricing that would be charged if it were sold on a standalone basis.

In the consolidated balance sheet at December 31, 2017, the deferred revenues of $25.5 million relating to the Eisai Agreement (primarily comprised of the deferred portion of the previously received upfront payments and the $10.0 million payment received from Eisai in December 2016) were classified as liabilities of disposal group held for sale.

Prior to December 2016, we deferred recognition of revenue and the related cost at the time we sold lorcaserin to Eisai because we did not have the ability to estimate the amount of product that could have been returned to us and thus recognized revenues and the related costs from net product sales when Eisai shipped BELVIQ to its distributors. Pursuant the Transaction Agreement, we determined that we achieved the ability to reasonably estimate the amount of product returns and recognize revenue and the related cost from product sales when we ship BELVIQ to Eisai. On December 28, 2016, we recognized revenues of $6.7 million and costs of $1.9 million on net product sales which had been previously deferred, which is a component of discontinued operations in the consolidated statement of operations.

*Development payments.*

As part of the US approval of BELVIQ, the FDA, is requiring the evaluation of the effect of long-term treatment with BELVIQ on the incidence of major adverse cardiovascular events, or MACE, in overweight and obese patients with cardiovascular disease or multiple cardiovascular risk factors (which is the FDA-required portion of the cardiovascular outcomes trial), as well as the conduct of postmarketing studies to assess the safety and efficacy of BELVIQ for weight management in obese pediatric and adolescent patients. Under the Second Amended Agreement, Eisai and we were responsible for 90% and 10%, respectively, of the cost for the FDA-required portion of the cardiovascular outcomes trial, or CVOT, 50% and 50%, respectively, of the non-FDA portion of the studies and we were also obligated to share the cost of FDA-required studies in obese pediatric patients and for additional clinical studies in other territories.

Under the Eisai Agreement, Eisai is solely responsible for all costs and expenses in connection with further development of lorcaserin from and after July 1, 2016, and we were relieved of any obligations under the Second Amended Agreement to pay our share of future development costs of lorcaserin. Accordingly, on December 28, 2016, we recorded a reduction of research and development expenses which would have been otherwise due to Eisai under the Second Amended Agreement of $3.7 million for the period from July 1, 2016, through December 28, 2016.

For the year ended December 31, 2016, we recognized expenses of $4.2 million for external clinical study fees related to lorcaserin, which are included in continuing operations. There were no such expenses in 2018 and 2017. Additionally, for the years ended December 31, 2017, and 2016, we recognized expenses of $1.4 million, and $3.1 million, respectively for internal non-commercial manufacturing costs primarily related to lorcaserin, which are included in discontinued operations.

**Ildong Pharmaceutical Co., Ltd.**

In November 2012, we and Ildong entered into the Marketing and Supply Agreement, or Ildong Agreement. Under this agreement, we granted Ildong exclusive rights to commercialize BELVIQ in South Korea for weight loss or weight management in obese and overweight patients. We also provided certain services and manufacture and sold BELVIQ to Ildong. As noted above, the Ildong Agreement was assigned to Eisai pursuant to the Eisai Agreement on December 28, 2016.

In connection with entering into the Ildong Agreement, we received from Ildong an upfront payment of $5.0 million, less withholding taxes. Revenues from this upfront payment were deferred, as we determined that the exclusive rights did not have standalone value without our ongoing development and regulatory activities. Accordingly, this payment was recognized ratably as revenue over the period in which we expected the services to be rendered. The assignment of the Ildong Agreement pursuant to the Transaction Agreement with Eisai effectively eliminated our obligation to continue performing the development and regulatory activities required in the Ildong Agreement. Therefore, on December 28, 2016, the $3.5 million of deferred revenues from this upfront payment was allocated to the value of the License provided to Eisai and recognized as revenue in 2016.

Under the Ildong Agreement, we manufactured BELVIQ at our facility in Zofingen, Switzerland, and sold BELVIQ to Ildong for a purchase price starting at the higher of the defined minimum amount or 35% of Ildong's annual net product sales (which are the gross invoiced sales less certain deductions described in the Ildong Agreement), or the Ildong Product Purchase Price. The Ildong Product Purchase Price increased on a tiered basis up to the higher of the defined minimum amount or 45% on the portion of annual net product sales exceeding $15.0 million. Since the inception of commercial sales of BELVIQ in South Korea in 2015, the Ildong Product Purchase Price equaled the defined minimum amount (which exceeded the amounts calculated using the applicable percentages for the applicable tiers of Ildong's annual net product sales).

Prior to December 2016, we deferred recognition of revenue and the related cost at the time we sold BELVIQ to Ildong because we did not have the ability to estimate the amount of product that could have been returned to us and thus recognized revenues and the related costs from net product sales when Ildong shipped BELVIQ to its distributors. In December 2016, we determined that we achieved the ability to reasonably estimate product returns under the Ildong Agreement. Accordingly, we recognized revenues of $2.0 million and costs of $0.7 million in December 2016 on net product sales which had been previously deferred, of which is a component of discontinued operations in the consolidated statement of operations.

For the year ended December 31, 2016, we recognized revenues of $11.4 million under the Ildong agreement, of which $7.2 million is included in discontinued operations. No revenues were recognized during the years ended December 31, 2018 and 2017, under this agreement as a result of the assignment of our rights under the Ildong Agreement to Eisai.

**CY Biotech Company Limited.**

In July 2013, we entered into the CYB Agreement. Under this agreement, we granted CYB exclusive rights to commercialize BELVIQ in Taiwan for weight loss or weight management in obese and overweight patients, subject to regulatory approval of BELVIQ by the Taiwan Food and Drug Administration, or TFDA. The CYB Agreement provided for us to perform certain services and to manufacture and sell BELVIQ to CYB. As noted above, the CYB Agreement was assigned to Eisai pursuant to the Transaction Agreement with Eisai on December 28, 2016.

In connection with entering into the CYB agreement, we received from CYB an upfront payment of $2.0 million, less withholding taxes. Revenues from this upfront payment were deferred, as we determined that the exclusive rights did not have standalone value without our ongoing development and regulatory activities. Accordingly, this payment was recognized ratably as revenue over the period in which we expected the services to be rendered. The assignment of the CYB Agreement pursuant to the Eisai Agreement effectively eliminated our obligation to continue performing the development and regulatory activities required in the CYB Agreement. Therefore, on December 28, 2016, the $1.7 million of deferred revenues from this upfront payment was allocated to the value of the License provided to Eisai and recognized as revenue in 2016.

For the year ended December 31, 2016, we recognized revenues of $1.8 million under this agreement. No revenues were recognized during the years ended December 31, 2018 and 2017, under this agreement as a result of the assignment of our rights under the CYB Agreement to Eisai.

**Boehringer Ingelheim International GmbH.**

In December 2015, we and Boehringer Ingelheim entered into a collaboration and license agreement, or Boehringer Ingelheim Agreement, under which we and Boehringer Ingelheim conduct joint research to identify drug candidates targeting an undisclosed G protein-coupled receptor, or GPCR, that belongs to the group of orphan central nervous system, or CNS, receptors. Under Boehringer Ingelheim Agreement, we granted Boehringer Ingelheim exclusive rights to our internally discovered, novel compounds and intellectual property for an orphan CNS receptor. The Boehringer Ingelheim Agreement was in effect through January 2018. We and Boehringer Ingelheim agreed to extend the original term of the Boehringer Ingelheim Agreement by twelve months through January 2019 and by additional six months through July 2019. The agreement grants Boehringer Ingelheim exclusive worldwide rights to develop, manufacture and commercialize products resulting from the collaboration.

In part consideration of the exclusive rights to our intellectual property necessary or useful to conduct the joint research under the Boehringer Ingelheim Agreement, we received from Boehringer Ingelheim an upfront payment of $7.5 million in 2016.

In December 2018, we earned a milestone payment of $3.5 million upon Boehringer Ingelheim's start of preclinical development.

We are also eligible to receive up to an aggregate of $247.5 million (of which the first $8.5 million is payable to Beacon) in success milestone payments in case of full commercial success of multiple drug products.

The promised goods and services under the Boehringer Ingelheim Agreement are accounted for as a single combined performance obligation consisting of a research license, a development and commercialization license and research services. Our performance obligation under the original term of the Boehringer Ingelheim Agreement was fully satisfied as of January 2018, and accordingly the estimated total transaction price of the Boehringer Ingelheim Agreement under the original contractual term of $10.5 million was fully recognized as revenue over the period from January 2016 through January 2018. We recognize revenue for the combined performance obligation based on the amount of incurred development expenses reimbursed by the customer as a percentage of total expected reimbursable expenses associated with the contract. The estimated total transaction price associated with the extended term of the Boehringer Ingelheim Agreement and the portion associated with performance obligations to be satisfied in the future are immaterial. As of December 31, 2018, all future potential milestone payments were excluded from the estimated total transaction price as they are considered constrained.

For the years ended December 31, 2018, 2017, and 2016, we recognized revenues of $4.4 million, $5.1 million and $5.1 million, respectively from the Boehringer Ingelheim Agreement.

**Outpost Medicine LLC.**

In April 2018, we and Outpost Medicine entered into a license agreement, or Outpost Agreement, under which Outpost Medicine has an exclusive right to advance an undisclosed, preclinical compound with potential utility in treating genitourinary disorders.

Under the Outpost Agreement, we received an upfront payment of $3.0 million, of which $1.5 million was in the form of an equity interest in Outpost Medicine. We are eligible to receive up to an aggregate of $96.5 million in success milestone payments in case of full commercial success of the potential drug product.

The promised goods and services under the Outpost Agreement are accounted for as a single performance obligation consisting of a research, development and commercialization license. Our performance obligation under the Outpost Agreement was fully satisfied at the inception of the Outpost Agreement and, accordingly, the estimated total transaction price of the Outpost Agreement was fully recognized as revenue in the second quarter of 2018. As of December 31, 2018, all future potential milestone payments were excluded from the estimated total transaction price as they are considered constrained.

For the years ended December 31, 2018 and 2017, we recognized revenues of 2.8 million and $0.2 million, respectively from the Outpost Agreement.

**Axovant Sciences GmbH.**

In May 2015, we entered into a development, marketing and supply agreement with Roivant Sciences Ltd., or Roivant. In October 2015, Roivant, assigned the exclusive rights to develop and commercialize nelotanserin to its subsidiary, Axovant. Under this agreement, Axovant has exclusive worldwide rights to develop and commercialize nelotanserin, subject to regulatory approval. We also provide certain services and will manufacture and sell nelotanserin to Axovant. We refer to this agreement as the Axovant Agreement.

Under the Axovant Agreement, we received an upfront payment of $4.0 million. We are entitled to receive payments from sales of nelotanserin under the agreement and are eligible to receive purchase price adjustment payments based on Axovant's annual net product sales. We are also eligible to receive up to an aggregate of $41.5 million in success milestones in case of full development and regulatory success of nelotanserin.

The promised goods and services under the Axovant Agreement are accounted for as two separate performance obligations: (i) a combined performance obligation consisting of commercialization rights and development and regulatory services and (ii) a manufacturing and supply commitment. We recognize revenue for the combined performance obligation consisting of commercialization rights and development and regulatory services based on the amount of incurred development expenses reimbursed by the customer as a percentage of total expected reimbursable expenses associated with the contract. In December 2018, Axovant announced negative results of an exploratory Phase 2 clinical study and a discontinuation of further clinical development activities under the nelotanserin program. As a result, we revised our estimate of the total transaction price as of December 31, 2018, based on our assessment that we will not perform any research and development services for Axovant in the future and concluded that all our performance obligations have been satisfied. As of December 31, 2018, all future potential purchase price adjustment payments and milestone payments were excluded from the estimated total transaction price as they are considered constrained.

For the years ended December 31, 2018, 2017, and 2016, and we recognized revenues of $2.2 million, $2.2 million and $2.1 million, respectively, from the Axovant Agreement.

**9. Income Taxes**

The following table summarizes our loss attributable to stockholders of Arena before benefit for income taxes by region for the years presented, in thousands:

| | Years ended December 31, | | |
|---|---|---|---|
| | 2018 | 2017 | 2016 |
| United States | $ (138,522) | $ (62,109) | $ (10,268) |
| Foreign | (1,142) | (29,298) | (12,248) |
| Total loss attributable to stockholders of Arena before income taxes | $ (139,664) | $ (91,407) | $ (22,516) |

For the year ended December 31, 2018, we have recorded a benefit for income taxes for the release of a portion of the valuation allowance due to the estimated taxable gain from the transaction pursuant to the United Therapeutics Agreement that closed on January 24, 2019. We have not recorded a benefit for income taxes for the years ended December 31, 2017, and 2016, because we had a full valuation allowance.

Our effective income tax rate differs from the statutory federal rate of 21% for 2018 and 34% for 2017 and 2016 due to the following, in thousands:

| | Years ended December 31, | | |
|---|---|---|---|
| | 2018 | 2017 | 2016 |
| Benefit for income taxes at statutory federal rate | $ (29,090) | $ (32,140) | $ (4,053) |
| Change in valuation allowance due to tax reform | — | 96,333 | — |
| Change in federal and foreign valuation allowance | (76,336) | (68,604) | (3,867) |
| Permanent differences and other | 1,963 | (782) | 3,412 |
| Share-based compensation expense | 889 | 7,071 | 4,001 |
| Foreign losses at lower effective rates | 257 | 1,428 | 3,944 |
| Research and development and Orphan Drug credits | (7,948) | (3,306) | (3,437) |
| Benefit for income taxes | $ (110,265) | $ — | $ — |

The components of our net deferred tax assets are as follows, in thousands:

| | December 31, | |
|---|---|---|
| | 2018 | 2017 |
| Deferred tax assets: | | |
| Federal and California NOL carryforwards | $ 210,853 | $ 179,323 |
| Federal and California research and development credit carryforwards | 69,221 | 61,272 |
| Foreign NOL carryforwards | 15,131 | 15,425 |
| Share-based compensation expense | 6,124 | 4,884 |
| Depreciation | 2,914 | 3,896 |
| Deferred revenues | — | 3,554 |
| Other, net | 784 | 5,758 |
| Total deferred tax assets | 305,027 | 274,112 |
| Deferred tax liabilities | — | — |
| Net deferred tax assets | 305,027 | 274,112 |
| Valuation allowance | (194,694) | (274,112) |
| Net deferred tax assets | $ 110,333 | $ — |

A valuation allowance is recorded against a portion of our deferred tax assets, as realization of a portion of these assets is not more-likely-than-not. The realization of our deferred tax assets is dependent upon future taxable income. In January 2019, a taxable income generating event, the transaction pursuant to the United Therapeutics Agreement, resulted in it being more-likely-than-not that a portion of our deferred tax assets would be realized in 2019, thus a portion of the valuation allowance in 2018 was released. We believe our net operating losses will be sufficient to offset our estimate of taxable income in 2019. Our ability to generate taxable income is analyzed regularly on a jurisdiction-by-jurisdiction basis. At such time as it is more-likely-than-not that we will generate taxable income in a jurisdiction, we will further reduce or remove the valuation allowance. The valuation allowance decreased by $79.4 million from December 31, 2017, to December 31, 2018.

On December 22, 2017, H.R. 1/Public Law No. 115-97 known as the Tax Cuts and Jobs Act, or the Tax Act, was signed into law. The effects of this new federal legislation are recognized upon enactment, which is the date a bill is signed into law. The Tax Act includes numerous changes in existing tax law, including a permanent reduction in the federal corporate income tax rate from 35% to 21%. The rate reduction took effect on January 1, 2018. As a result of the Tax Act, we have revalued our net deferred tax assets as of December 31, 2017 to reflect the rate reduction.

Pursuant to the SEC Staff Accounting Bulletin No. 118, *Income Tax Accounting Implications of the Tax Cuts and Jobs Act*, or SAB 118, a company may select between one of three scenarios to determine a reasonable estimate arising from the Tax Act. Those scenarios are (i) a final estimate which effectively closes the measurement window; (ii) a reasonable estimate leaving the measurement window open for future revisions; and (iii) no estimate as the law is still being analyzed. We were able to provide a reasonable estimate for the revaluation of deferred taxes and the effects of the transition tax on undistributed foreign earnings and profits for the period ended December 31, 2017. During the quarter ended December 31, 2018, we completed our analysis of the impacts of the Tax Act. There were no significant changes to our estimate.

At December 31, 2018, we had federal NOL carryforwards of $869.4 million that will begin to expire in 2023 unless previously utilized. At the same date, we had California NOL carryforwards of $404.8 million, which begin expiring in 2028 and foreign NOL carryforwards of $184.3 million, which begin expiring in 2019. Net operating losses generated after December 31, 2017 carry forward indefinitely. Net operating losses generated in 2018 are subject to an 80% limitation. At December 31, 2018, we also had federal and California research and development tax credit carryforwards, net of reserves, of $33.8 million and $24.2 million, respectively. At December 31, 2018, we had a Federal Orphan Drug Credit carryforward, net of reserves, of $15.9 million. Federal credit carryforwards will begin to expire after 2026 unless previously utilized. The California research and development credit carries forward indefinitely.

Sections 382 and 383 of the IRC limit the utilization of tax attribute carryforwards that arise prior to certain cumulative changes in a corporation's ownership. We have completed an IRC Section 382/383 analysis through 2018 and identified ownership changes that limit our utilization of tax attribute carryforwards. Pursuant to IRC Section 382 and 383, use of our net operating loss and research and development income tax credit carryforwards may be limited in the event of cumulative changes in ownership subsequent to 2018 of more than 50% within a three-year period.

In accordance with authoritative guidance, the impact of an uncertain income tax position on the income tax return must be recognized at the largest amount that is more-likely-than-not to be sustained upon audit by the relevant taxing authority. An uncertain income tax position will not be recognized if it has less than a 50% likelihood of being sustained.

The following table reconciles the beginning and ending amount of unrecognized tax benefits for the years presented, in thousands:

| | Years ended December 31, | | |
|---|---|---|---|
| | 2018 | 2017 | 2016 |
| Gross unrecognized tax benefits at the beginning of the year | $ 7,762 | $ 5,906 | $ 5,619 |
| Additions from tax positions taken in the current year | 1,269 | 1,133 | 287 |
| Additions from tax positions taken in prior years | 2 | 723 | — |
| Reductions from tax positions taken in prior years | — | — | — |
| Tax settlements | — | — | — |
| Gross unrecognized tax benefits at end of the year | $ 9,033 | $ 7,762 | $ 5,906 |

Of our total unrecognized tax benefits at December 31, 2018, $7.5 million will impact our effective tax rate in the event the valuation allowance is removed. We do not anticipate that there will be a substantial change in unrecognized tax benefits within the next 12 months.

Our practice is to recognize interest and/or penalties related to income tax matters in income tax expense. Because we have incurred net losses since our inception, we did not have any accrued interest or penalties included in our consolidated balance sheets at December 31, 2018, or 2017, and did not recognize any interest and/or penalties in our consolidated statements of operations and comprehensive loss for the years ended December 31, 2018, 2017, and 2016.

We are subject to income taxation in the United States at the Federal and state levels. All tax years are subject to examination by US and California tax authorities due to the carryforward of unutilized NOLs and tax credits. We are also subject to foreign income taxes in the countries in which we operate. To our knowledge, we are not currently under examination by any taxing authorities.

**10. Legal Proceedings**

Beginning in September 2010, a number of complaints were filed in the US District Court for the Southern District of California, or District Court, against us and certain of our current and former employees and directors on behalf of certain purchasers of our common stock. The complaints were brought as purported stockholder class actions, and, in general, include allegations that we and certain of our current and former employees and directors violated federal securities laws by making materially false and misleading statements regarding our BELVIQ program, thereby artificially inflating the price of our common stock. The plaintiffs sought unspecified monetary damages and other relief. In August 2011, the District Court consolidated the actions and appointed a lead plaintiff and lead counsel. In November 2017, we and the Lead Plaintiff signed a stipulation and agreement of settlement, or Stipulation, to resolve the consolidated class action. Under the terms of the Stipulation, and in exchange for a release of all claims by class members and a dismissal of the consolidated class action with prejudice, we have agreed that (i) our insurers would pay class members and their attorneys a total of approximately $12.025 million and (ii) Arena would pay class members and their attorneys approximately $11.975 million in either shares of our common stock or cash at our election. On November 30, 2017, the District Court preliminary approved the settlement and the form of notice to potential class members of the proposed settlement and the procedure by which they can become class members. On March 8, 2018, the lead plaintiff filed motions for final approval of the settlement, the plan of allocation and award of attorney fees. On April 12, 2018, the District Court entered its final approval order approving the settlement and the plan of allocation and request for attorneys' fees and expense. We recognized $11.975 million of net expense for the portion of the settlement that we agreed to pay in either common stock or cash in the consolidated statements of operations for the year ended December 31, 2017, and $24.0 million as a current liability in the consolidated balance sheet as of December 31, 2017 for the gross settlement liability, with a corresponding $12.025 million insurance recovery receivable. In the second quarter of 2018, we and our insurer made settlement payments in cash to the class members and their attorneys to settle our liability under the Stipulation.

On September 30, 2016, we and Eisai Inc. filed a patent infringement lawsuit against Lupin Limited and Lupin Pharmaceuticals, Inc. (collectively, Lupin) in the U.S. District Court for the District of Delaware. The lawsuit relates to a "Paragraph IV certification" notification that we and Eisai Inc. received regarding an abbreviated new drug application, or ANDA, submitted to the FDA by Lupin requesting approval to engage in the commercial manufacture, use, importation, offer for sale or sale of a generic version of BELVIQ (lorcaserin hydrochloride tablets, 10 mg). In its notification, Lupin alleged that no valid, enforceable claim of any of the patents that are listed in the FDA's Approved Drug Products with Therapeutic Equivalence Evaluations, or Orange Book, for BELVIQ will be infringed by Lupin's manufacture, importation, use, sale or offer for sale of the product described in its ANDA for 10

mg lorcaserin hydrochloride tablets. Lupin is accused of infringing U.S. Patent Nos. 6,953,787; 7,514,422; 7,977,329; 8,207,158 and 8,273,734. In accordance with the Hatch-Waxman Act, as a result of filing a patent infringement lawsuit within 45 days of receipt of Lupin's notification, the FDA cannot approve Lupin's ANDA any earlier than 7.5 years from NDA approval unless a District Court finds that all of the asserted claims of the patents-in-suit are invalid, unenforceable or not infringed. On January 11, 2017, Lupin filed an answer, defenses and counterclaims to the September 30, 2016 complaint. We and Eisai Inc. filed an answer to Lupin's counterclaims on February 1, 2017. We and Eisai Inc. are seeking a determination from the court that, among other things, Lupin has infringed our patents, Lupin's ANDA for 10 mg lorcaserin hydrochloride tablets should not be approved until the expiration date of our patents, and Lupin should be enjoined from commercializing a product that infringes our patents. Trial is currently scheduled to begin on April 15, 2019. The parties have completed the expert discovery phase of the case and are now in the pretrial phase of the case.

On March 6, 2017, we and Eisai Inc. filed a patent infringement lawsuit against Teva Pharmaceuticals USA, Inc. and Teva Pharmaceutical Industries Ltd. (collectively, Teva) in the U.S. District Court for the District of Delaware. The lawsuit also relates to a "Paragraph IV certification" notification that we and Eisai Inc. received regarding an ANDA submitted to the FDA by Teva requesting approval to engage in the commercial manufacture, use, importation, offer for sale or sale of a generic version of BELVIQ XR (lorcaserin hydrochloride extended-release tablets, 20 mg). In its notification, Teva alleged that no valid, enforceable claim of any of the patents that are listed in the Orange Book for BELVIQ XR will be infringed by Teva's manufacture, importation, use, sale or offer for sale of the product described in its ANDA. Teva is accused of infringing U.S. Patent Nos. 6,953,787; 7,514,422; 7,977,329; 8,207,158 and 8,273,734. In accordance with the Hatch-Waxman Act, as a result of filing a patent infringement lawsuit within 45 days of receipt of Teva's notification, the FDA cannot approve Teva's ANDA any earlier than 7.5 years from NDA approval unless a District Court finds that all of the asserted claims of the patents-in-suit are invalid, unenforceable or not infringed. On April 18, 2017, Teva filed an amended answer, defenses and counterclaims to the March 6, 2017 complaint. We and Eisai Inc. are seeking a determination from the court that, among other things, Teva has infringed our patents, Teva's ANDA should not be approved until the expiration date of our patents, and Teva should be enjoined from commercializing a product that infringes our patents. On May 1, 2017, the Teva and Lupin actions were consolidated for all purposes and will follow the case schedule that was previously entered in the Lupin action. We and Eisai Inc. filed an answer to Teva's amended counterclaims on May 3, 2017. On or about October 16, 2017, we and Eisai Inc. received a "Paragraph IV certification" notification from Teva alleging that no valid, enforceable claim of U.S. Patent No. 9,770,455, which was listed in the Orange Book for BELVIQ and BELVIQ XR after the patent issued on September 26, 2017, will be infringed by Teva's manufacture, importation, use, offer for sale or sale of the product described in its ANDA. On October 25, 2017, we and Eisai Inc. filed a first amended complaint against Lupin and Teva, adding infringement of U.S. Patent No. 9,770,455 by their respective ANDA products to the consolidated lawsuit. On or about November 6, 2017, we and Eisai Inc. received a "Paragraph IV certification" notification from Lupin alleging that no valid, enforceable claim of U.S. Patent No. 9,770,455 will be infringed by Lupin's manufacture, importation, use, offer for sale or sale of the product described in its ANDA for 10 mg lorcaserin hydrochloride tablets.

We and Eisai Inc. also received a "Paragraph IV certification" notification from Lupin alleging that no valid, enforceable claim of any of the patents that are listed in the Orange Book for BELVIQ and BELVIQ XR will be infringed by Lupin's manufacture, importation, use, sale or offer for sale of the product described in its ANDA for 20 mg lorcaserin hydrochloride extended-release tablets. Because Lupin is not the first applicant to submit a substantially complete application containing a Paragraph IV certification for approval of a generic equivalent of BELVIQ XR, absent extenuating circumstances, Lupin would not be able to launch its 20 mg lorcaserin hydrochloride extended-release tablets before Teva was able to launch its respective product. On March 23, 2018, we and Eisai Inc. filed a second amended complaint against Lupin and Teva, adding infringement of U.S. Patent Nos. 6,953,787, 7,514,422, 7,977,329, 8,207,158, 8,273,734, and 9,770,455 by Lupin's generic equivalent of BELVIQ XR. This consolidated action against Lupin and Teva is currently in the pretrial phase of the case with trial scheduled to begin on April 15, 2019.

We cannot predict the ultimate outcome of any of the proceedings with Lupin and Teva.

**11. Restructuring Activities**

In the second quarter of 2016, we committed to a reduction in our US workforce of approximately 73%, or approximately 100 employees, which we substantially completed in the third quarter of 2016. As a result of this workforce reduction, we recorded a restructuring charge in the second quarter of 2016 of $6.1 million for termination benefits, including severance and other benefits. Included within this amount is non-cash, share-based compensation expense of $1.0 million related to the accelerated vesting of stock options and the extension of the exercise period of vested options for employees impacted by the workforce reduction. Substantially all of this charge had been paid in 2016.

**12. Quarterly Financial Data (Unaudited)**

The following tables present selected quarterly financial data for the years presented, in thousands, except per share data:

| 2018 | Quarter ended December 31 | Quarter ended September 30 | Quarter ended June 30 | Quarter ended March 31 |
|---|---|---|---|---|
| Revenues | $ 8,648 | $ 3,573 | $ 3,994 | $ 1,755 |
| Operating costs and expenses | 53,292 | 39,577 | 37,160 | 32,724 |
| Net income (loss): | | | | |
| Income (loss) from continuing operations | $ 68,711 | $ (34,314) | $ (31,833) | $ (31,133) |
| Loss from discontinued operations | — | — | — | (830) |
| | $ 68,711 | $ (34,314) | $ (31,833) | $ (31,963) |
| | | | | |
| Net income (loss) per share, basic: | | | | |
| Continuing operations | $ 1.39 | $ (0.70) | $ (0.65) | $ (0.78) |
| Discontinued operations | — | — | — | (0.02) |
| | $ 1.39 | $ (0.70) | $ (0.65) | $ (0.80) |
| | | | | |
| Net income (loss) per share, diluted: | | | | |
| Continuing operations | $ 1.35 | $ (0.70) | $ (0.65) | $ (0.78) |
| Discontinued operations | — | — | — | (0.02) |
| | $ 1.35 | $ (0.70) | $ (0.65) | $ (0.80) |

| 2017 | Quarter ended December 31 | Quarter ended September 30 | Quarter ended June 30 | Quarter ended March 31 |
|---|---|---|---|---|
| Revenues | $ 15,364 | $ 2,415 | $ 1,898 | $ 1,660 |
| Operating costs and expenses | 28,964 | 36,626 | 24,850 | 22,864 |
| Net income (loss): | | | | |
| Loss from continuing operations | $ (14,270) | $ (35,270) | $ (23,763) | $ (22,551) |
| Income from discontinued operations | 315 | 2,606 | 147 | 54 |
| | $ (13,955) | $ (32,664) | $ (23,616) | $ (22,497) |
| | | | | |
| Amounts attributable to stockholders of Arena: | | | | |
| Loss from continuing operations | $ (13,999) | $ (34,959) | $ (23,464) | $ (22,107) |
| Income from discontinued operations | 315 | 2,606 | 147 | 54 |
| | $ (13,684) | $ (32,353) | $ (23,317) | $ (22,053) |
| | | | | |
| Net income (loss) attributable to stockholders of Arena per share, basic and diluted: | | | | |
| Continuing operations | $ (0.36) | $ (0.93) | $ (0.77) | $ (0.90) |
| Discontinued operations | 0.01 | 0.07 | — | — |
| | $ (0.35) | $ (0.86) | $ (0.77) | $ (0.90) |

**13. Beacon Discovery, Inc.**

On September 1, 2016, we entered into a series of agreements with Beacon. Beacon, a privately held drug discovery incubator which focuses on identifying and advancing molecules targeting GPCRs, was founded and is owned by several of our former employees.

We entered into an agreement, or License and Collaboration Agreement, with Beacon, pursuant to which we transferred certain equipment to Beacon and granted Beacon a non-exclusive, non-assignable and non-sublicensable license to certain database information relating to compounds, receptors and pharmacology, and transferred certain equipment to Beacon. Beacon will seek to engage global partners to facilitate discovery and development. Beacon has agreed to assign to us any intellectual property relating to our existing research and development programs developed in the course of performing research for us, and grant us a non-exclusive license to any intellectual property developed outside the course of performing work for us that is reasonably necessary or useful for developing or commercializing the products under our research and development programs. We are also entitled to rights of

negotiation and rights of first refusal to potentially obtain licenses to compounds discovered and developed by Beacon. In addition, we are entitled to receive (i) a percentage of any revenue received by Beacon on or after the second anniversary of the effective date of the agreement from any third party pursuant to a third-party license, including upfront payments, milestone payments and royalties; (ii) single-digit royalties on the aggregate net sales of any related products sold by Beacon and its affiliates; and (iii) in the event that Beacon is sold, a percentage of the consideration for such sale transaction.

We entered a services agreement with Beacon, or Master Services Agreement, pursuant to which Beacon performs certain research services for us.

We also entered into a separate services agreement with Beacon, or Beacon Services Agreement, pursuant to which Beacon now performs our research obligations under our December 2015 agreement with Boehringer Ingelheim. In consideration for performing these research obligations, Beacon is entitled to receive the applicable FTE payments that are paid to us by Boehringer Ingelheim for the research services and certain milestone payments.

We also entered into a sublease agreement, or Sublease, with Beacon, pursuant to which we sublease approximately 15,000 square feet of laboratory, office and meeting room space to Beacon until August 2021. In August 2018, we and Beason amended the Sublease and extended the term of the Sublease until May 2027. Beacon can defer payments due to us under the Sublease by increasing the outstanding principal amount under a secured promissory note, or Note, we issued to Beacon. The outstanding principal amount and all accrued or unpaid interest thereon (calculated at a simple interest rate of 7% per annum) shall be due and payable on the earlier of (i) August 31, 2022 or (ii) Beacon receiving cumulative cash proceeds of $10.0 million from the sale of equity, issuance of debt or third-party license revenue.

As Beacon's equity investment at risk is not sufficient to permit Beacon to finance its activities without subordinated financial support, Beacon is considered a variable interest entity in which we hold a significant variable interest pursuant to the License and Collaboration Agreement. We do not own any equity interest in Beacon; however, as the agreements described above provided us the controlling financial interest in Beacon until December 2017, we consolidated Beacon's balances and activity within our consolidated financial statements until December 2017 as we were determined to be the primary beneficiary of Beacon. Pursuant to a contract Beacon entered into with a third party in December 2017 which provided Beacon with a certain amount of upfront funding, we determined we no longer held the controlling financial interest as of that date and, therefore, deconsolidated Beacon from our consolidated financial statements as we were no longer deemed to be the primary beneficiary. Our consolidated financial statements for the year ended December 31, 2017, include Beacon's results of operations and cash flows until the December 2017 deconsolidation. As of December 31, 2018, Beacon's total assets of $10.0 million, total liabilities of $6.0 million and total stockholders' equity of $4.0 million are excluded from our consolidated balance sheet. As of December 31, 2017, Beacon's total assets of $1.0 million, total liabilities of $1.8 million and total stockholders' deficit of $0.8 million are excluded from our consolidated balance sheet.

For the year ended December 31, 2018, Beacon recognized revenues of $11.1 million of which $4.5 million was earned by Beacon from agreements with us. For the year ended December 31, 2018, Beacon reported net income of $3.6 million. For the year ended December 31, 2017, Beacon recognized revenues of $2.7 million of which less than $0.1 million was earned from third parties and is included on our consolidated statement of operations. For the year ended December 31, 2017, Beacon incurred a net and comprehensive loss of $1.3 million which is fully presented as net loss attributable to noncontrolling interest in consolidated variable interest entity in our consolidated statement of operations and comprehensive loss as we do not own any equity interest in Beacon.

As of December 31, 2018, a note receivable from Beacon with a balance of $0.4 million is included in prepaid expenses and other current assets in our consolidated balance sheet. We believe that our maximum exposure to loss as a result of our involvement with Beacon is limited to the receivable due to us from Beacon under the Sublease and the Note.

**14. Subsequent Events**

See Notes 1 and 8 regarding the completion of the transaction pursuant to the United Therapeutics Agreement with United Therapeutics and Note 10 for the update to our legal proceedings, which occurred subsequent to December 31, 2018.

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

None.

**Item 9A. Controls and Procedures.**

**Conclusion Regarding the Effectiveness of Disclosure Controls and Procedures**

We maintain disclosure controls and procedures that are designed to ensure that information required to be disclosed in our periodic and current reports that we file with the SEC is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms, and that such information is accumulated and communicated to our management, including our principal executive officer and principal financial officer, as appropriate, to allow timely decisions regarding required disclosure.

As of December 31, 2018, we conducted an evaluation, under the supervision and with the participation of our management, including our Chief Executive Officer and Chief Financial Officer, of our disclosure controls and procedures, as such term is defined under Rule 13a-15(e) promulgated under the Securities Exchange Act of 1934, as amended, or the Exchange Act. Based on this evaluation, our Chief Executive Officer and Chief Financial Officer concluded that our disclosure controls and procedures were effective at the reasonable assurance level as of the end of the period covered by this Annual Report on Form 10-K.

**Management's Report on Internal Control Over Financial Reporting**

Our management is also responsible for establishing and maintaining for us adequate internal control over financial reporting, as such term is defined in Exchange Act Rule 13a-15(f). Under the supervision and with the participation of our management, including our Chief Executive Officer and Chief Financial Officer, we conducted an evaluation of the effectiveness of our internal control over financial reporting based on the *Internal Control—Integrated Framework* (2013 framework) issued by the Committee of Sponsoring Organizations of the Treadway Commission. Based on our evaluation under this framework, our management concluded that our internal control over financial reporting was effective as of December 31, 2018.

The registered public accounting firm that audited our financial statements as of and for the year ended December 31, 2018, included in this Annual Report on Form 10-K, has issued an attestation report on our internal control over financial reporting, and such report is included below.

**Changes in Internal Control Over Financial Reporting**

An evaluation was also performed under the supervision and with the participation of our management, including our Chief Executive Officer and Chief Financial Officer, of any changes in our internal control over financial reporting that occurred during our last fiscal quarter and that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting. That evaluation did not identify any change in our internal control over financial reporting during the fourth quarter of the year ended December 31, 2018 that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

**Report of Independent Registered Public Accounting Firm**

To the Stockholders and Board of Directors
Arena Pharmaceuticals, Inc.:

*Opinion on Internal Control over Financial Reporting*

We have audited Arena Pharmaceuticals, Inc. and subsidiaries' (the Company) internal control over financial reporting as of December 31, 2018, based on criteria established in *Internal Control – Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission. In our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2018, based on criteria established in *Internal Control – Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated balance sheets of the Company as of December 31, 2018 and 2017, the related consolidated statements of operations and comprehensive loss, equity, and cash flows for each of the years in the three-year period ended December 31, 2018, and the related notes (collectively, the consolidated financial statements), and our report dated February 28, 2019 expressed an unqualified opinion on those consolidated financial statements.

*Basis for Opinion*

The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management's Report on Internal Control over Financial Reporting. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audit also included performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

*Definition and Limitations of Internal Control over Financial Reporting*

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

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

/s/ KPMG LLP

San Diego, California
February 28, 2019

**Item 9B. Other Information.**

Not applicable.

## PART III

### Item 10. Directors, Executive Officers and Corporate Governance.

We have adopted a Code of Business Conduct and Ethics that applies to our directors and employees (including our principal executive officer, principal financial officer, principal accounting officer and controller), and have posted the text of the policy on our website (*www.arenapharm.com*) in connection with "Investor" materials. In addition, we intend to promptly disclose on our website in the future (i) the date and nature of any amendment (other than technical, administrative or other non-substantive amendments) to the policy that applies to our principal executive officer, principal financial officer, principal accounting officer or controller, or persons performing similar functions and relates to any element of the code of ethics definition enumerated in Item 406(b) of Regulation S-K, and (ii) the nature of any waiver, including an implicit waiver, from a provision of the policy that is granted to one of these specified individuals that relates to one or more of the elements of the code of ethics definition enumerated in Item 406(b) of Regulation S-K, the name of such person who is granted the waiver and the date of the waiver.

The other information required by this item will be included under the captions "Election of Directors," "Compensation and Other Information Concerning Executive Officers, Directors and Certain Stockholders" and "Section 16(a) Beneficial Ownership Reporting Compliance" in our definitive proxy statement for the annual meeting of stockholders to be held in June 2019 to be filed with the SEC on or before April 30, 2019, or the Proxy Statement, and is incorporated herein by reference.

### Item 11. Executive Compensation.

The information required by this item will be included under the captions "Compensation and Other Information Concerning Executive Officers, Directors and Certain Stockholders" and "Compensation Committee Interlocks and Insider Participation" in the Proxy Statement and is incorporated herein by reference.

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

The information required by this item will be included under the captions "Security Ownership of Certain Beneficial Owners and Management" and "Securities Authorized for Issuance Under Equity Compensation Plans" in the Proxy Statement and is incorporated herein by reference.

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

The information required by this item will be included under the captions "Certain Relationships and Related Transactions" and "Election of Directors" in the Proxy Statement and is incorporated herein by reference.

### Item 14. Principal Accountant Fees and Services.

The information required by this item will be included under the captions "Independent Auditors' Fees" and "Pre-approval Policies and Procedures" in the Proxy Statement and is incorporated herein by reference.

## PART IV

### Item 15. Exhibits, Financial Statement Schedules.

(a) **1. FINANCIAL STATEMENTS**

Reference is made to the Index to Financial Statements under Item 8, Part II hereof.

**2. FINANCIAL STATEMENT SCHEDULES**

The financial statement schedules have been omitted either because they are not required or because the information has been included in the consolidated financial statements or the notes thereto included in this annual report.

**3. EXHIBITS**

| Exhibit No. | Exhibit Description |
|---|---|
| 2.1* | Agreement of Purchase and Sale, dated as of March 21, 2007, by and between Arena and BMR-6114-6154 Nancy Ridge Drive LLP (as assignee of BioMed Realty, L.P.) (incorporated by reference to Exhibit 2.1 to Arena's current report on Form 8-K filed with the Securities and Exchange Commission on May 8, 2007, Commission File No. 000-31161) |
| 2.2+* | Exclusive License Agreement, dated as of November 15, 2018, by and between Arena and United Therapeutics Corporation (incorporated by reference to Exhibit 2.1 to Arena's current report on Form 8-K filed with the Securities and Exchange Commission on January 25, 2019, Commission File No. 000-31161) |
| 3.1 | Fifth Amended and Restated Certificate of Incorporation of Arena (incorporated by reference to Exhibit 3.1 to Arena's quarterly report on Form 10-Q for the quarter ended June 30, 2002, filed with the Securities and Exchange Commission on August 14, 2002, Commission File No. 000-31161) |
| 3.2 | Certificate of Amendment of the Fifth Amended and Restated Certificate of Incorporation of Arena (incorporated by reference to Exhibit 4.2 to Arena's registration statement on Form S-8 filed with the Securities and Exchange Commission on June 28, 2006, Commission File No. 333-135398) |
| 3.3 | Certificate of Amendment No. 2 of the Fifth Amended and Restated Certificate of Incorporation of Arena, as amended (incorporated by reference to Exhibit 4.3 to Arena's registration statement on Form S-8 filed with the Securities and Exchange Commission on June 30, 2009, Commission File No. 333-160329) |
| 3.4 | Certificate of Amendment No. 3 of the Fifth Amended and Restated Certificate of Incorporation of Arena, as amended (incorporated by reference to Exhibit 3.4 to Arena's registration statement on Form S-8 filed with the Securities and Exchange Commission on June 20, 2012, Commission File No. 333-182238) |
| 3.5 | Certificate of Amendment No. 4 of the Fifth Amended and Restated Certificate of Incorporation of Arena, as amended (incorporated by reference to Exhibit 3.1 to Arena's current report on Form 8-K filed with the Securities and Exchange Commission on June 15, 2017, Commission File No. 000-31161) |
| 3.6 | Amended and Restated Bylaws of Arena (incorporated by reference to Exhibit 3.1 to Arena's current report on Form 8-K filed with the Securities and Exchange Commission on October 9, 2014, Commission File No. 000-31161) |
| 4.1 | Reference is made to Exhibits 3.1, 3.2, 3.3, 3.4, 3.5 and 3.6 |
| 4.2 | Form of common stock certificate (incorporated by reference to Exhibit 4.7 to Arena's registration statement on Form S-8, filed with the Securities and Exchange Commission on June 22, 2017, Commission File No. 333-218905) |
| 10.1** | 2006 Long-Term Incentive Plan, as amended (incorporated by reference to Exhibit 10.1 to Arena's current report on Form 8-K filed with the Securities and Exchange Commission on April 13, 2007, Commission File No. 000-31161) |
| 10.2** | Form of Stock Option Grant Agreement under the Arena 2006 Long-Term Incentive Plan, as amended (incorporated by reference to Exhibit 10.1 to Arena's current report on Form 8-K filed with the Securities and Exchange Commission on August 1, 2006, Commission File No. 000-31161) |
| 10.3** | Form of Stock Option Grant Agreement—Director under the Arena 2006 Long-Term Incentive Plan, as amended (incorporated by reference to Exhibit 10.2 to Arena's current report on Form 8-K filed with the Securities and Exchange Commission on August 1, 2006, Commission File No. 000-31161) |
| 10.4** | Form of Incentive Stock Option Grant Agreement under the Arena 2006 Long-Term Incentive Plan, as amended (incorporated by reference to Exhibit 10.3 to Arena's current report on Form 8-K filed with the Securities and Exchange Commission on August 1, 2006, Commission File No. 000-31161) |
| 10.5** | Form of Indemnification Agreement between Arena and its directors (incorporated by reference to Exhibit 10.1 to Arena's current report on Form 8-K filed with the Securities and Exchange Commission on June 18, 2007, Commission File No. 000-31161) |
| 10.6** | Form of Indemnification Agreement between Arena and its executive officers (incorporated by reference to Exhibit 10.2 to Arena's current report on Form 8-K filed with the Securities and Exchange Commission on June 18, 2007, Commission File No. 000-31161) |

| Exhibit No. | Exhibit Description |
|---|---|
| 10.7** | Form of Indemnification Agreement between Arena and individuals serving as its directors and executive officers (incorporated by reference to Exhibit 10.3 to Arena's current report on Form 8-K filed with the Securities and Exchange Commission on June 18, 2007, Commission File No. 000-31161) |
| 10.8 | Lease agreement between BMR-6114-6154 Nancy Ridge Drive LLC and Arena for 6114 Nancy Ridge Drive, San Diego, California (incorporated by reference to Exhibit 10.5 to Arena's quarterly report on Form 10-Q for the quarter ended June 30, 2007, filed with the Securities and Exchange Commission on August 9, 2007, Commission File No. 000-31161) |
| 10.9 | Lease agreement between BMR-6114-6154 Nancy Ridge Drive LLC and Arena for 6118 Nancy Ridge Drive, San Diego, California (incorporated by reference to Exhibit 10.6 to Arena's quarterly report on Form 10-Q for the quarter ended June 30, 2007, filed with the Securities and Exchange Commission on August 9, 2007, Commission File No. 000-31161) |
| 10.10 | Lease agreement between BMR-6114-6154 Nancy Ridge Drive LLC and Arena for 6122, 6124 and 6126 Nancy Ridge Drive, San Diego, California (incorporated by reference to Exhibit 10.7 to Arena's quarterly report on Form 10-Q for the quarter ended June 30, 2007, filed with the Securities and Exchange Commission on August 9, 2007, Commission File No. 000-31161) |
| 10.11 | Lease agreement between BMR-6114-6154 Nancy Ridge Drive LLC and Arena for 6154 Nancy Ridge Drive, San Diego, California (incorporated by reference to Exhibit 10.8 to Arena's quarterly report on Form 10-Q for the quarter ended June 30, 2007, filed with the Securities and Exchange Commission on August 9, 2007, Commission File No. 000-31161) |
| 10.12** | Form of Amended and Restated Termination Protection Agreement, dated December 30, 2008, by and between Arena and Mr. Spector (incorporated by reference to Exhibit 10.2 to Arena's Form 8-K filed with the Securities and Exchange Commission on December 31, 2008, Commission File No. 000-31161) |
| 10.13** | Arena's 2009 Long-Term Incentive Plan (incorporated by reference to Exhibit 99.1 to Arena's registration statement on Form S-8 filed with the Securities and Exchange Commission on June 30, 2009, Commission File No. 333-160329) |
| 10.14** | Form of Incentive Stock Option Grant Agreement for Employees under the Arena 2009 Long-Term Incentive Plan (incorporated by reference to Exhibit 10.7 to Arena's quarterly report on Form 10-Q for the quarter ended June 30, 2009, filed with the Securities and Exchange Commission on August 7, 2009, Commission File No. 000-31161) |
| 10.15** | Form of Stock Option Grant Agreement for Employees or Consultants under the Arena 2009 Long-Term Incentive Plan (incorporated by reference to Exhibit 10.8 to Arena's quarterly report on Form 10-Q for the quarter ended June 30, 2009, filed with the Securities and Exchange Commission on August 7, 2009, Commission File No. 000-31161) |
| 10.16** | Arena's 2012 Long-Term Incentive Plan (incorporated by reference to Exhibit 99.1 to Arena's registration statement on Form S-8 filed with the Securities and Exchange Commission on June 20, 2012, Commission File No. 333-182238) |
| 10.17** | Form of Stock Option Grant Agreement for Employees or Consultants for grants prior to December 13, 2012, under the Arena 2012 Long-Term Incentive Plan (incorporated by reference to Exhibit 10.4 to Arena's current report on Form 8-K filed with the Securities and Exchange Commission on June 20, 2012, Commission File No. 000-31161) |
| 10.18** | Arena's 2013 Long-Term Incentive Plan, as amended (incorporated by reference to Exhibit 10.3 to Arena's quarterly report on Form 10-Q for the quarter ended March 31, 2017, filed with the Securities and Exchange Commission on May 9, 2017, Commission File No. 000-31161) |
| 10.19** | Form of Stock Option Grant Agreement for Employees or Consultants under the Arena 2013 Long-Term Incentive Plan, as amended (incorporated by reference to Exhibit 10.3 to Arena's quarterly report on Form 10-Q for the quarter ended June 30, 2016, filed with the Securities and Exchange Commission on August 9, 2016, Commission File No. 000-31161) |
| 10.20** | Form of Incentive Stock Option Grant Agreement for Employees under the Arena 2013 Long-Term Incentive Plan (incorporated by reference to Exhibit 10.3 to Arena's current report on Form 8-K filed with the Securities and Exchange Commission on June 14, 2013, Commission File No. 000-31161) |
| 10.21** | Executive Employment Agreement, dated as of May 6, 2016, by and between Arena and Amit D. Munshi (incorporated by reference to Exhibit 10.1 to Arena's current report on Form 8-K filed with the Securities and Exchange Commission on May 9, 2016, Commission File No. 000-31161) |
| 10.22** | Amended and Restated Severance Agreement, dated as of January 4, 2019, by and between Arena and Amit D. Munshi |

| Exhibit No. | Exhibit Description |
|---|---|
| 10.23** | Form of Amendment to Amended and Restated Termination Protection Agreement, dated May 9, 2016, by and between Arena and Steven W. Spector (incorporated by reference to Exhibit 10.3 to Arena's current report on Form 8-K filed with the Securities and Exchange Commission on May 9, 2016, Commission File No. 000-31161) |
| 10.24** | Amended and Restated Severance Benefit Plan, effective January 4, 2019, and providing benefits for certain of Arena's executive officers |
| 10.25** | Employment Agreement, dated as of June 14, 2016, by and between Arena and Kevin R. Lind (incorporated by reference to Exhibit 10.1 to Arena's current report on Form 8-K filed with the Securities and Exchange Commission on June 16, 2016, Commission File No. 000-31161) |
| 10.26** | Summary of compensation for Arena's non-employee directors, approved June 13, 2017 (incorporated by reference to Exhibit 10.7 to Arena's quarterly report on Form 10-Q for the quarter ended June 30, 2017, filed with the Securities and Exchange Commission on August 8, 2017, Commission File No. 000-31161) |
| 10.27** | Summary of compensation for Arena's non-employee directors, approved June 13, 2018 (incorporated by reference to Exhibit 10.1 to Arena's current report on Form 8-K filed with the Securities and Exchange Commission on July 10, 2018, Commission File No. 000-31161) |
| 10.28** | Annual Incentive Plan for Arena's executive officers, approved February 11, 2019 |
| 10.29** | Employment Agreement, dated as of August 9, 2016, by and between Arena and Vincent E. Aurentz (incorporated by reference to Exhibit 10.3 to Arena's quarterly report on Form 10-Q for the quarter ended September 30, 2016, filed with the Securities and Exchange Commission on November 9, 2016, Commission File No. 000-31161) |
| 10.30** | Summary of housing allowance for Vincent E. Aurentz, effective February 2018 (incorporated by reference to Exhibit 10.44 to Arena's annual report on Form 10-K for the year ended December 31, 2017, filed with the Securities and Exchange Commission on March 14, 2018, Commission File No. 000-31161) |
| 10.31+ | Transaction Agreement, dated as of December 28, 2016, by and among 356 Royalty Inc., Eisai Inc. and Eisai Co., Ltd. (incorporated by reference to Exhibit 10.52 to Arena's annual report on Form 10-K for the year ended December 31, 2016, filed with the Securities and Exchange Commission on March 15, 2017, Commission File No. 000-31161) |
| 10.32 | Amendment No. 1 dated as of March 9, 2018, to Transaction Agreement, dated as of December 29, 2016, by and among 356 Royalty Inc., Eisai Inc. and Eisai Co. Ltd. (incorporated by reference to Exhibit 10.46 to Arena's annual report on Form 10-K for the year ended December 31, 2017, filed with the Securities and Exchange Commission on March 14, 2018, Commission File No. 000-31161) |
| 10.33 | Amendment, dated October 5, 2018, to Transaction Agreement, dated as of December 28, 2016 and amended as of March 9, 2018, by and among 356 Royalty Inc., Eisai Inc. and Eisai Co. Ltd. |
| 10.34+ | Supply Agreement, dated as of December 28, 2016, by and among Arena Pharmaceuticals GmbH, Eisai Inc. and Eisai Co., Ltd. (incorporated by reference to Exhibit 10.53 to Arena's annual report on Form 10-K for the year ended December 31, 2016, filed with the Securities and Exchange Commission on March 15, 2017, Commission File No. 000-31161) |
| 10.35 | Amendment No. 1 dated as of March 9, 2018, to Supply Agreement, dated as of December 28, 2016, by and among Arena Pharmaceuticals GmbH, Eisai Inc. and Eisai Co., Ltd. (incorporated by reference to Exhibit 10.48 to Arena's annual report on Form 10-K for the year ended December 31, 2017, filed with the Securities and Exchange Commission on March 14, 2018, Commission File No. 000-31161) |
| 10.36 | Equity Distribution Agreement, dated as of January 4, 2017, by and between Arena and Citigroup Global Markets Inc. (incorporated by reference to Exhibit 10.1 to Arena's current report on Form 8-K filed with the Securities and Exchange Commission on January 4, 2017, Commission File No. 000-31161) |
| 10.37** | Employment Agreement, dated as of February 15, 2017, by and between Arena and Preston Klassen, M.D. (incorporated by reference to Exhibit 10.1 to Arena's quarterly report on Form 10-Q for the quarter ended March 31, 2017, filed with the Securities and Exchange Commission on May 9, 2017, Commission File No. 000-31161) |
| 10.38** | Arena's 2017 Long-Term Incentive Plan (incorporated by reference to Exhibit 99.1 to Arena's registration statement on Form S-8 filed with the Securities and Exchange Commission on June 22, 2017, Commission File No. 333-218905) |

| Exhibit No. | Exhibit Description |
|---|---|
| 10.39** | Arena's Amended and Restated 2017 Long-Term Incentive Plan (incorporated by reference to Exhibit 99.1 to Arena's registration statement on Form S-8 filed with the Securities and Exchange Commission on June 14, 2018, Commission File No. 333-225608) |
| 10.40** | Form of Nonqualified Stock Option Grant Agreement for Employees and Consultants under the Arena 2017 Long-Term Incentive Plan (incorporated by reference to Exhibit 99.2 to Arena's registration statement on Form S-8 filed with the Securities and Exchange Commission on June 22, 2017, Commission File No. 333-218905) |
| 10.41** | Form of Incentive Stock Option Grant Agreement under the Arena 2017 Long-Term Incentive Plan (incorporated by reference to Exhibit 99.3 to Arena's registration statement on Form S-8 filed with the Securities and Exchange Commission on June 22, 2017, Commission File No. 333-218905) |
| 10.42** | Form of Restricted Stock Unit Grant Agreement (other than for non-employee directors) under the Arena 2017 Long-Term Incentive Plan (incorporated by reference to Exhibit 99.4 to Arena's registration statement on Form S-8 filed with the Securities and Exchange Commission on June 22, 2017, Commission File No. 333-218905) |
| 10.43** | Form of Restricted Stock Unit Grant Agreement for Non-Employee Directors under the Arena 2017 Long-Term Incentive Plan (incorporated by reference to Exhibit 99.5 to Arena's registration statement on Form S-8 filed with the Securities and Exchange Commission on June 22, 2017, Commission File No. 333-218905) |
| 10.44** | Form of Nonqualified Stock Option Grant Agreement for Non-Employee Directors under the Arena 2017 Long-Term Incentive Plan (incorporated by reference to Exhibit 99.6 to Arena's registration statement on Form S-8 filed with the Securities and Exchange Commission on June 22, 2017, Commission File No. 333-218905) |
| 10.45** | Form of Performance Restricted Stock Unit Grant Agreement under the Arena 2017 Long-Term Incentive Plan |
| 21.1 | Subsidiaries of the Registrant |
| 23.1 | Consent of Independent Registered Public Accounting Firm |
| 31.1 | Certification of principal executive officer pursuant to Rule 13a-14(A) promulgated under the Securities Exchange Act of 1934 |
| 31.2 | Certification of principal financial and accounting officer pursuant to 18 U.S.C. Section 1350 and Rule 13a-14(B) promulgated under the Securities Exchange Act of 1934 |
| 32.1 | Certification of principal executive officer and principal financial and accounting officer pursuant to 18 U.S.C. Section 1350 and Rule 13a-14(B) promulgated under the Securities Exchange Act of 1934 |
| 101.INS | XBRL Instance Document |
| 101.SCH | XBRL Taxonomy Extension Schema Document |
| 101.CAL | XBRL Taxonomy Extension Calculation Linkbase Document |
| 101.DEF | XBRL Taxonomy Extension Definition Linkbase Document |
| 101.LAB | XBRL Taxonomy Extension Label Linkbase Document |
| 101.PRE | XBRL Taxonomy Extension Presentation Linkbase Document |

+ Confidential treatment has been requested or granted with respect to certain portions of this exhibit. Omitted portions have been filed separately with the Securities and Exchange Commission.

* Exhibits and schedules to this agreement have been omitted pursuant to the rules of the Securities and Exchange Commission. We will submit copies of such exhibits and schedules to the Securities and Exchange Commission upon request.

** Management contract or compensatory plan or arrangement.

**(b) EXHIBITS**

See Item 15(a)(3) above.

**(c) FINANCIAL STATEMENT SCHEDULES**

See Item 15(a)(2) above.

**Item 16. Form 10-K Summary.**

None.

**SIGNATURES**

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

ARENA PHARMACEUTICALS, INC.

Date: February 28, 2019

By: /s/ AMIT D. MUNSHI
**Amit D. Munshi**
**President and Chief Executive Officer**
**(principal executive office)**

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the registrant and in the capacities and on the dates indicated.

| Signatures | Title | Date |
|---|---|---|
| **By:** /s/ AMIT D. MUNSHI<br>**Amit D. Munshi** | President and Chief Executive Officer and Director<br>(principal executive officer) | February 28, 2019 |
| **By:** /s/ KEVIN R. LIND<br>**Kevin R. Lind** | Executive Vice President and Chief Financial Officer<br>(principal financial and accounting officer) | February 28, 2019 |
| **By:** /s/ JAYSON DALLAS<br>**Jayson Dallas, M.D.** | Director | February 28, 2019 |
| **By:** /s/ OLIVER FETZER<br>**Oliver Fetzer, Ph.D.** | Director | February 28, 2019 |
| **By:** /s/ KIERAN T. GALLAHUE<br>**Kieran T. Gallahue** | Director | February 28, 2019 |
| **By:** /s/ JENNIFER JARRETT<br>**Jennifer Jarrett** | Director | February 28, 2019 |
| **By:** /s/ GARRY A. NEIL<br>**Garry A. Neil, M.D.** | Director | February 28, 2019 |
| **By:** /s/ TINA S. NOVA<br>**Tina S. Nova, Ph.D.** | Director | February 28, 2019 |
| **By:** /s/ MANMEET S. SONI<br>**Manmeet S. Soni** | Director | February 28, 2019 |
| **By:** /s/ RANDALL E. WOODS<br>**Randall E. Woods** | Director | February 28, 2019 |

**Exhibit 10.22**

**ARENA PHARMACEUTICALS, INC.**

**AMENDED AND RESTATED SEVERANCE AGREEMENT**

This Amended and Restated Severance Agreement (this "***Severance Agreement***") is made and entered into by and between Amit D. Munshi ("***Executive***") and Arena Pharmaceuticals, Inc. (the "***Company***"), and is effective as of January 4, 2019 (the "***Effective Date***"). As of the Effective Date this Severance Agreement amends, restates and supersedes in its entirety the Severance Agreement between Executive and the Company dated May 6, 2016.

**Whereas**, in connection with his continued employment with the Company, Executive shall have important management responsibilities and talents which benefit the Company and its affiliates; and

**Whereas**, the Company believes that its best interests are served if Executive is encouraged to remain with the Company and the Company has determined that Executive's ability to perform Executive's responsibilities and utilize Executive's talents for the benefit of the Company, and the Company's ability to retain Executive as an employee, will be significantly enhanced if Executive is provided with fair and reasonable protection from the risks associated with a termination of employment; and

**Whereas**, the Board has approved and authorized this Severance Agreement to become effective as of the Effective Date.

**Now, Therefore**, the Company and Executive hereby agree as follows:

**Section 1. Defined Terms.**

The following shall be defined terms for purposes of this Severance Agreement:

**(a)** "***Base Salary***" means Executive's monthly base salary in effect immediately prior to the Covered Termination, ignoring any reduction made to such monthly base salary which forms the basis for Executive's termination for Good Reason, if applicable (including without limitation any cash compensation that is deferred by Executive into a Company-sponsored retirement or deferred compensation plan, exclusive of any employer matching contributions by the Company associated with any such retirement or deferred compensation plan and exclusive of any other Company contributions) and excludes all bonuses, commissions, expatriate premiums, fringe benefits (including without limitation car allowances), option grants, equity awards, employee benefits and other similar items of compensation.

**(b)** "***Board***" means the Board of Directors of the Company, or a committee or subcommittee of such Board.

**(c)** "***Bonus Amount***" means Executive's target bonus in place in effect immediately prior to the Covered Termination, ignoring any reduction which forms the basis for Executive's termination for Good Reason, if applicable.

**(d)** "***Cause***" for the Company to terminate Executive's employment hereunder shall mean the occurrence of one or more of the following events if such event results in a demonstrably harmful impact on the Company's business or reputation, as reasonably determined by the Board:

**(1)** Executive's willful and continued failure to substantially perform his duties with the Company (other than any such failure resulting from incapacity due to physical or mental illness), after a written demand for substantial performance is delivered to Executive by the Board which specifically identifies the manner in which the Board believes that Executive has not substantially performed his duties. For a termination of employment to be for Cause pursuant to this subsection (1)(d)(1), Executive must (a) receive a written notice which indicates in reasonable detail the facts and circumstances claimed to provide a basis for the termination of his employment for Cause; and (b) be provided with an opportunity to be heard no earlier than 30 days following the receipt of such notice (during which notice period Executive has the opportunity to cure and has failed to cure or resolve the behavior in question).

**(2)** Executive's conviction of, or plea of guilty or nolo contendere to, a felony or any crime involving fraud, dishonesty or moral turpitude;

**(3)** Executive's willful engaging in gross misconduct; or

**(4)** Executive's unauthorized use or disclosure of material confidential information or material trade secrets of the Company.

**(e)** "***Change in Control***" means the occurrence of any of the following events:

**(1)** any person or group of persons acting in concert (excluding Company benefit plans) becomes the beneficial owner of securities of the Company having at least 30% of the voting power of the Company's then outstanding securities (unless the event causing the 30% threshold to be crossed is an acquisition of voting common securities directly from the Company);

**(2)** any merger or other business combination of the Company, any sale or lease of the Company's assets or any combination of the foregoing transactions (the "***Transactions***") other than a Transaction immediately following which the stockholders of the Company immediately prior to the Transaction own at least 60% of the voting power, directly or indirectly, of (A) the surviving corporation in any such merger or other business combination; (B) the purchaser or lessee of the Company's assets; or (C) both the surviving corporation and the purchaser or lessee in the event of any combination of Transactions, in each case in substantially the same proportions as their ownership of the outstanding voting securities of the Company immediately prior to such Transaction; or

**(3)** within any 24 month period, the persons who were directors immediately before the beginning of such period (the "***Incumbent Directors***") cease to constitute at least a majority of the Board or the board of directors of a successor to the Company. For this purpose, any director who was not a director at the beginning of such period shall be deemed to be an Incumbent Director if such director was elected to the Board by, or on the recommendation of or with the approval of, at least three-quarters of the directors who then qualified as Incumbent Directors (so long as such director was not nominated by a person who has expressed an intent to effect a Change in Control or engage in a proxy or other control contest).

**(f)** "***Code***" means the Internal Revenue Code of 1986, as amended.

**(g)** "***Company***" means Arena Pharmaceuticals, Inc. and its successors and assigns.

**(h)** "***Covered Termination***" means Executive's termination of employment by the Company without Cause or Executive's termination with Good Reason (excluding terminations due to Disability or death).

**(i)** "***Disability***" means the inability of Executive to perform satisfactorily all of Executive's usual services for the Company because Executive has become permanently disabled within the meaning of any policy of disability income insurance covering employees of the Company then in force. In the event the Company has no policy of disability income insurance covering employees of the Company in force when Executive becomes disabled, then such term shall mean Executive's permanent and total disability within the meaning of Section 22(e)(3) of the Code.

**(j)** "***Employment Agreement***" means the Executive Employment Agreement between the Company and Executive dated May 6, 2016, as it may be amended from time to time in accordance with its terms.

**(k)** "***Good Reason***" means, with respect to Executive, any one of the following:

**(1)** any material reduction in Executive's annual base salary (except for salary decreases generally applicable to the Company's other similarly-situated employees, but not exceeding a decrease of ten percent (10%) of Executive's highest base salary);

**(2)** any material reduction in Executive's target bonus level or bonus opportunities;

**(3)** Executive's duties, authorities or responsibilities are materially diminished;

**(4)** a material breach of the Employment Agreement, including failure of the Company to obtain a satisfactory agreement from any assignee of assets of the Company to assume and agree to perform the terms of this Severance Agreement and the Employment Agreement; or

**(5)** the relocation without Executive's prior written approval of Executive's principal office or place of business to a location that would cause an increase by more than thirty-five (35) miles in Executive's one-way commuting distance from Executive's principal personal residence to the principal office or business location at which Executive is required to perform services, except for required travel for the Company's business to an extent substantially consistent with Executive's prior business travel obligations.

In any case, in order for Executive to terminate for Good Reason, (i) Executive must give the Company notice of the event that triggers such Good Reason within ninety (90) days after its occurrence, which notice must be provided in writing and indicate that Executive considers such event to trigger Good Reason under this Severance Agreement, (ii) the Company does not cure the event within thirty (30) days of the giving of such written notice and (iii) Executive terminates his employment within sixty (60) days after the end of the cure period. Executive's continued

employment shall not constitute consent to, or a waiver of rights with respect to, any circumstances constituting Good Reason hereunder.

**(l)** "***Severance Period***" means twenty-four (24) months.

**(m)** "***Section 409A***" means Section 409 of the Code and the regulations and other guidance thereunder and any state law of similar effect.

**Section 2. Eligibility for Benefits.**

In order to be eligible to receive benefits under this Severance Agreement, Executive must (i) experience a Covered Termination, (ii) execute a general waiver and release in substantially the form attached hereto as **Exhibit A** within the applicable time period set forth therein, but in no event later than sixty (60) days following termination of Executive's employment, and provided that such release becomes effective, and (iii) return all Company-owned property to the Company as instructed by the Company. The Company shall provide the form of such release to Executive on, or within a reasonable time after, the termination of Executive's employment. The Company, in its sole discretion, may at any time modify the form of the required release to effect a release of claims consistent with this Section 2. In the event that Executive's employment is terminated as a result of Executive's death or Disability, then Executive shall not be entitled to the benefits provided in this Severance Agreement.

**Section 3. Amount of Benefit.**

Subject to the limitations and reductions provided in this Severance Agreement, benefits under this Severance Agreement, if any, shall be provided to Executive in the following amounts:

**(a)** Covered Termination Benefits. Upon Executive's Covered Termination, Executive shall receive the following severance package:

**(1)** *Cash Severance Benefits*. Within five business days after the earlier of (i) Executive's death or (ii) the sixtieth (60th) day following the Covered Termination, and in either event on or before March 15 of the year following the year in which the Covered Termination occurred, Executive will receive a cash payment in an amount equal to the sum of Executive's Base Salary and Bonus Amount multiplied by the number of months in the Severance Period. Additionally, if Executive's Covered Termination occurs following the end of an annual bonus period, but before payment of a bonus for such period, Executive shall be paid an amount equivalent to the cash bonus that he otherwise (notwithstanding the occurrence of the Covered Termination) would have received under the Company's annual incentive plan for such period, based on actual performance as determined by the Board (or a committee thereof) in accordance with the terms of such plan, and such bonus shall be paid at the time it otherwise (notwithstanding the occurrence of the Covered Termination) would have been paid under the terms of the Company's annual incentive plan, but in no event (i) prior to the effectiveness of the waiver and release described in Section 2 above or (ii) later than March 15 of the year following the year in which the Covered Termination occurred.

**(2)** *COBRA Benefits*. If Executive timely elects to continue coverage under the Consolidated Omnibus Budget Reconciliation Act of 1985, as amended ("***COBRA***"), then the

Company will directly pay to Executive a fully taxable monthly cash payment equal to the amount of Executive's monthly COBRA group health insurance premium until the earliest of (A) the end of the Severance Period or (B) the expiration of Executive's eligibility for the continuation coverage under COBRA. For purposes of this Section, references to COBRA premiums shall not include any amounts payable by Executive under a Code Section 125 health care reimbursement plan. The foregoing taxable payment shall be paid in monthly installments on the same schedule that the COBRA premiums would otherwise have been paid, and shall be paid until the earlier of (i) expiration of the Severance Period or (ii) the date Executive is no longer enrolled in such COBRA coverage.

**(3)** *Equity Acceleration and Continued Stock Option Post-Termination Exercise Period*. Executive will receive immediate vesting of all stock options and other equity awards issued by the Company and held by Executive that would have vested had Executive remained employed by the Company through the end of the Severance Period. In addition, with respect to stock options granted to Executive, Executive shall be entitled to exercise all of his vested stock options until the later of (i) the original post-termination exercise period provided in the applicable stock option agreement or (ii) the number of months equal to the Severance Period (but not beyond the original contractual life of the option). Notwithstanding any other provision of this Severance Agreement to the contrary, this Severance Agreement shall not affect (including with respect to vesting) any stock awards for which the vesting thereof is conditioned upon the satisfaction of performance criteria ("***Performance-Related Awards***"), including any such grants under the Company's Performance Restricted Stock Unit Grant Agreement. For the avoidance of doubt, Performance-Related Awards do not include any stock awards or portions thereof (including stock options) for which the vesting thereof is conditioned solely upon Executive's continued service over a specified time period (i.e., time-based vesting).

All cash severance payment referenced in this Section 3 shall be subject to all applicable tax withholdings and deductions required by law. Except as provided herein, all terms, conditions and limitations applicable to Executive's stock options and/or equity awards shall remain in full force and effect.

**(b)** **Sole Severance Agreement**. The benefits under this Severance Agreement shall supersede any similar severance benefits under any other severance plan, agreement or program of the Company, with the exception of any severance benefits provided under the Employment Agreement. In addition, the benefits under this Severance Agreement shall be reduced by any amounts that would be due under any federal, state or local laws, including, without limitation the Workers Adjustment Retraining Notification Act, 29 U.S.C. Section 2101 et seq. or any similar state statutes, and such reduction(s), if any, shall apply during the period such amounts otherwise are due. The benefits provided under this Severance Agreement are intended to satisfy any and all statutory obligations that may arise out of Executive's involuntary termination of employment for the foregoing reasons, and the Board shall so construe and implement the terms of this Severance Agreement.

**Section 4. Limitations on Benefits.**

**(a)** **Mitigation**. Except as otherwise specifically provided herein, Executive shall not be required to mitigate damages or the amount of any payment provided under this Severance

Agreement by seeking other employment or otherwise, nor shall the amount of any payment provided for under this Severance Agreement be reduced by any compensation earned by Executive as a result of employment by another employer or any retirement benefits received by Executive after the date of service or employment termination.

**(b) Termination of Benefits**. Benefits under this Severance Agreement shall terminate immediately if Executive, at any time, (i) engages in the unauthorized use or disclosure of the Company's material confidential information, material trade secrets or material proprietary information under Executive's Employee Proprietary Information and Inventions Agreement dated May 18, 2016 or any other written agreement under which Executive has such an obligation to the Company that survives Executive's termination of service to the Company, (ii) intentionally or in any material respect engages in any prohibited or unauthorized competitive activities or solicitation or recruitment of employees, in violation of any written agreement under which Executive has such an obligation to the Company that survives Executive's termination of service to the Company, (iii) intentionally or in any material respect violates the terms or conditions of this Severance Agreement or (iv) intentionally or in any material respect violates the terms of the applicable general waiver and release referenced in Section 2 above.

**(c) Indebtedness of Executive**. If Executive is indebted to the Company or an affiliate of the Company on the date of his termination of employment or service, the Company reserves the right to offset any severance benefits payable in cash under this Severance Agreement by the amount of such indebtedness, except to the extent such offset would cause adverse tax consequences to Executive or the Company under Section 409A.

**(d) Parachute Payments**. If any payment or benefit Executive would receive in connection with a change in control from the Company or otherwise (a "***Payment***") would (i) constitute a "parachute payment" within the meaning of Section 280G of the Code, and (ii) but for this sentence, be subject to the excise tax imposed by Section 4999 of the Code (the "***Excise Tax***"), then such Payment shall be equal to the Reduced Amount. The "***Reduced Amount***" shall be either (x) the largest portion of the Payment that would result in no portion of the Payment being subject to the Excise Tax or (y) the largest portion of the Payment, up to and including the total Payment, whichever amount, after taking into account all applicable federal, state and local employment taxes, income taxes and the Excise Tax (all computed at the highest applicable marginal rate), results in Executive's receipt, on an after-tax basis, of the greater amount of the Payment notwithstanding that all or some portion of the Payment may be subject to the Excise Tax. If a reduction in payments or benefits constituting "parachute payments" is necessary so that the Payment equals the Reduced Amount, reduction shall occur in the following order: reduction of cash payments; cancellation of accelerated vesting of stock awards; reduction of employee benefits. If acceleration of vesting of stock award compensation is to be reduced, such acceleration of vesting shall be cancelled first with respect to stock awards (including stock options) that are not subject to Treas. Reg. 280G 1 Q&A 24(c) and next for stock awards (including stock options) subject to Treas. Reg. 280G 1 Q&A 24(c) and in both cases starting from the last vesting tranche. Notwithstanding the foregoing, to the extent that it is permitted under Sections 409A, 280G and 4999 of the Code, Executive may designate a different order of reduction in payments or benefits constituting "parachute payments".

The Company shall appoint a nationally recognized independent accounting firm to make the determinations required hereunder, which accounting firm shall not then be serving as accountant or auditor for the individual, entity or group that effected the Change in Control. The Company shall bear all expenses with respect to the determinations by such accounting firm required to be made hereunder.

The accounting firm engaged to make the determinations hereunder shall provide its calculations, together with detailed supporting documentation, to the Company and Executive within ten (10) calendar days after the date on which Executive's right to a Payment is triggered (if requested at that time by the Company or Executive) or such other time as requested by the Company or Executive. If the accounting firm determines that no Excise Tax is payable with respect to a Payment, either before or after the application of the Reduced Amount, it shall furnish the Company and Executive with an opinion reasonably acceptable to Executive that no Excise Tax will be imposed with respect to such Payment. Any good faith determinations of the accounting firm made hereunder shall be final, binding and conclusive upon the Company and Executive.

**Section 5. Right to Interpret; Amendment and Termination.**

**(a)** **Dispute Resolution**. Any dispute or controversy arising in connection hereof shall be subject to the Dispute Resolution provisions in Section 8 of the Employment Agreement.

**(b)** **Amendment**. The Board reserves the right to amend this Severance Agreement or the benefits provided hereunder at any time; provided, however, that no such amendment shall impair or reduce the rights of Executive unless Executive consents to such amendment in writing.

**(c)** **Termination**. This Severance Agreement shall automatically terminate upon any termination of Executive's employment with the Company that is not a Covered Termination and may be terminated at any time by mutual written agreement of Executive and the Company.

**(d)** **Section 409A**. This Severance Agreement is intended to be interpreted and applied so that the payment of the benefits set forth herein shall be exempt from the requirements of Section 409A (including but not limited to the exemption provided under Treasury Regulations Sections 1.409A-1(b)(4), 1.409A-1(b)(5) and 1.409A 1(b)(9)) to the maximum extent that such exemption if available and any ambiguities shall be interpreted accordingly; *provided, however*, that to the extent such exemption is not available, such benefits shall comply with the requirements of Section 409A to the extent necessary to avoid adverse personal tax consequences and any ambiguities herein shall be interpreted accordingly. Each payment under this Severance Agreement shall be treated as a separate and distinct payment for purposes of Section 409A. Notwithstanding any provision in this Severance Agreement or elsewhere to the contrary, if Executive is a "specified employee" within the meaning of Section 409A, any payments or benefits due upon a termination or resignation of Executive's employment under this Severance Agreement that constitute a "deferral of compensation" within the meaning of Section 409A and which do not otherwise qualify under the exemptions under Treas. Regs. Section 1.409A-1 (including without limitation, the short-term deferral exemption and the permitted payments under Treas. Regs. Section 1.409A-1(b)(9)(iii)(A)), shall be delayed and paid or provided on the earlier of (i) the date which is six (6) months and one (1) day after Executive's "separation from service", as such term

is defined in Treasury Regulations Section 1.409A-1(h) ("***Separation from Service***") for any reason other than death, and (ii) the date of Executive's death (such applicable earlier date, the "***Delayed Initial Payment Date***"). Notwithstanding anything in this Severance Agreement, or elsewhere to the contrary, distributions under this Severance Agreement upon termination of Executive's employment may only be made upon Executive's Separation from Service and such date shall be considered the termination date for purposes of receiving severance benefits under this Severance Agreement, unless such amounts may be provided to Executive without causing adverse tax consequences.

In no event shall payment of any benefits under this Severance Agreement be made prior to Executive's termination date or prior to the effective date of the general waiver and release described in Section 2 of this Severance Agreement. In no event may Executive, directly or indirectly, designate the calendar year of any payment to be made under this Severance Agreement which constitutes a "deferral of compensation" within the meaning of Section 409A. If the Company determines that any payments or benefits provided under this Severance Agreement constitute "deferred compensation" under Section 409A, and Executive's Separation from Service occurs at a time during the calendar year when the general waiver and release described in Section 2 of this Severance Agreement could become effective in the calendar year following the calendar year in which Executive's Separation from Service occurs, then regardless of when such general waiver and release is returned to the Company and becomes effective, such general waiver and release will not be deemed effective (solely for purposes of timing of severance payments) any earlier than the first day of the second calendar year.

**Section 6. No Implied Employment Contract.**

This Severance Agreement shall not be deemed (i) to give Executive any right to be retained in the employ or service of the Company or (ii) to interfere with the right of the Company to discharge any employee or other person at any time and for any reason, which right is hereby reserved. The Company and Executive acknowledge that Executive's employment relationship is at-will and either Executive or the Company may terminate the employment relationship at any time, with or without Cause or advance notice.

**Section 7. General Provisions.**

**(a)** **Notices**. Any notices provided must be in writing and will be deemed effective upon the earlier of personal delivery (including personal delivery by fax) or the next day after sending by overnight carrier, to the Company at its primary office location and to Executive at the address as listed on the Company payroll.

**(b)** **Severability**. Whenever possible, each provision of this Severance Agreement will be interpreted in such manner as to be effective and valid under applicable law, but if any provision of this Severance Agreement is held to be invalid, illegal or unenforceable in any respect under any applicable law or rule in any jurisdiction, such invalidity, illegality or unenforceability will not affect any other provision or any other jurisdiction, but this Severance Agreement will be reformed, construed and enforced in such jurisdiction to the extent possible in keeping with the intent of the parties.

**(c)** **Waiver**. Any waiver of any breach of any provisions of this Severance Agreement must be in writing to be effective, and it shall not thereby be deemed to have waived any preceding or succeeding breach of the same or any other provision of this Severance Agreement.

**(d)** **Counterparts**. This Severance Agreement may be executed in separate counterparts, any one of which need not contain signatures of more than one party, but both of which taken together will constitute one and the same Severance Agreement.

**(e)** **Headings**. The headings of the sections hereof are inserted for convenience only and shall not be deemed to constitute a part hereof nor to affect the meaning thereof.

**(f)** **Successors and Assigns**. This Severance Agreement is intended to bind and inure to the benefit of and be enforceable by Executive and the Company, and their respective successors, assigns, heirs, executors and administrators, except that (a) Executive may not assign any of Executive's duties hereunder and Executive may not assign any of Executive's rights hereunder without the written consent of the Company, which shall not be withheld unreasonably and (b) the Company may not assign its rights and obligations hereunder except to a successor to all or substantially all of its assets or business who assumes in writing the obligations of this Severance Agreement.

**(g)** **Tax Withholding**. All payments contemplated or made pursuant to this Severance Agreement will be subject to withholdings of applicable taxes in compliance with all relevant laws and regulations of all appropriate government authorities. Executive acknowledges and agrees that the Company has neither made any assurances nor any guarantees concerning the tax treatment of any payments contemplated by or made pursuant to this Severance Agreement. Executive has had the opportunity to retain a tax and financial advisor and fully understands the tax and economic consequences of all payments made pursuant to this Severance Agreement.

**(h)** **Choice of Law**. All questions concerning the construction, validity and interpretation of this Severance Agreement will be governed by the laws of the State of California without regard to conflict of law provisions.

**In Witness Whereof**, this Severance Agreement shall be effective as of the Effective Date.

**Arena Pharmaceuticals, Inc.**

| | |
|---|---|
| By: | /s/ Suzanne C. Zoumaras |
| Name: | EVP and Chief Human Resources Officer |
| Title: | January 4, 2019 |

**Executive**

/s/ Amit D. Munshi
Amit D. Munshi

**EXHIBIT A**

RELEASE AGREEMENT

**I understand and agree completely to the terms set forth in the Amended and Restated Severance Agreement between Arena Pharmaceuticals, Inc. (the "*Company*") and me dated January 4, 2019 (the "*Agreement*"). I understand that this release and waiver (the "*Release*"), together with the Severance Agreement, constitutes the complete, final and exclusive embodiment of the entire agreement between the Company and me with regard to the subject matter hereof. I am not relying on any promise or representation by the Company that is not expressly stated herein or in the Severance Agreement.**

In consideration of benefits I will receive under the Severance Agreement, I hereby generally and completely release the Company and its directors, officers, employees, agents, attorneys, predecessors, successors, parent and subsidiary entities, insurers, and affiliates from any and all claims, liabilities and obligations, both known and unknown, that arise out of or are in any way related to (i) my employment, (ii) the termination of my employment or (iii) events, acts, conduct, or omissions between the Company and me occurring prior to my signing this Release, except for claims for benefits set forth in the Severance Agreement or other severance arrangement applicable to me, applicable equity compensation plans and grants, any applicable indemnification agreement or other indemnification obligation under the Company's charter documents or any rights or claims I may have to indemnification or legal defense pursuant to any policy of insurance protecting or applicable to directors and/or officers of the Company, and any rights or claims which are not waivable as a matter of law. Subject to the foregoing, this Release includes, but is not limited to: (1) all claims arising out of or in any way related to my employment with the Company or the termination of that employment; (2) all claims related to my compensation or benefits from the Company, including, but not limited to, salary, bonuses, commissions, vacation pay, expense reimbursements, severance pay, fringe benefits, stock, stock options, or any other ownership interests in the Company; (3) all claims for breach of contract, wrongful termination, and breach of the implied covenant of good faith and fair dealing; (4) all tort claims, including, but not limited to, claims for fraud, defamation, emotional distress, and discharge in violation of public policy; and (5) all federal, state, and local statutory claims, including, but not limited to, claims for discrimination, harassment, retaliation, attorneys' fees, or other claims arising under the federal Civil Rights Act of 1964 (as amended), the federal Americans with Disabilities Act of 1990, the federal Age Discrimination in Employment Act of 1967 (as amended) ("***ADEA***"), and the California Fair Employment and Housing Act (as amended).

I acknowledge that the consideration given under the Release for the waiver and release in the preceding paragraph hereof is in addition to anything of value to which I was already entitled.

If I am over the age of 40 years at the time of an Covered Termination (as that term is defined in the Severance Agreement), I acknowledge that I am knowingly and voluntarily waiving and releasing any rights I may have under the ADEA. I further acknowledge that I have been advised by this writing, as required by the ADEA, that: (A) my waiver and release do not apply to any rights or claims that may arise on or after the date I execute this Release; (B) I should consult with an attorney prior to executing this Release; (C) I have twenty-one (21) days (or such greater

time as may be required by law) to consider this Release (although I may choose to voluntarily execute this Release earlier); (D) I have seven (7) days following my execution of this Release to revoke the Release; and (E) this Release shall not be effective until the date upon which the revocation period has expired, which shall be the eighth (8th) day after I execute this Release.

If I am not over the age of 40 years at the time of an Covered Termination (as that term is defined in the Severance Agreement), I understand and agree that I will have ten days to consider and execute this release and that it shall be effective upon such execution.

Except if prohibited by law or regulation, (i) I represent that I have not filed any claims against the Company and agree that I will not file any claim against the Company or seek any compensation for any claim other than the payments and benefits referenced herein and (ii) I agree to indemnify and hold the Company harmless from and against any and all loss, cost, and expense, including, but not limited to court costs and attorney's fees, arising from or in connection with any action which may be commenced, prosecuted, or threatened by me or for my benefit, upon my initiative, or with my voluntary aid or approval, contrary to the provisions of this Release.

I acknowledge that I have read and understand Section 1542 of the California Civil Code which reads as follows: "**A general release does not extend to claims which the creditor does not know or suspect to exist in his or her favor at the time of executing the release, which if known by him or her must have materially affected his or her settlement with the debtor.**" I hereby expressly waive and relinquish all rights and benefits under that section and any law of any jurisdiction of similar effect with respect to my release of any claims I may have against the Company, its affiliates, and the entities and persons specified above.

The provisions of the Release shall be deemed severable, and the invalidity or unenforceability of any provision hereof shall not affect the validity or enforceability of the other provisions hereof, and, to the greatest extent legally possible, effect shall be given to the intent manifested by the portion held invalid or inoperative.

The Release shall become binding when signed by the Executive, and may be executed by facsimile or a PDF sent by email.

**EXECUTIVE**

Print Name:
Date:

**Exhibit 10.24**

**ARENA PHARMACEUTICALS, INC.**

**AMENDED AND RESTATED SEVERANCE BENEFIT PLAN**

**Section 1. Introduction.**

The Arena Pharmaceuticals, Inc. Amended and Restated Severance Benefit Plan originally effective on January 20, 2006 and most recently previously amended and restated on May 9, 2016 and further amended on June 15, 2016, August 15, 2016, March 20, 2017, October 31, 2018 and November 26, 2018 (collectively, the "***Prior Plan***"), is hereby amended and restated in its entirety (as set forth herein, this "***Plan***") effective January 4, 2019 (the "***Effective Date***").

The purpose of this Plan is to provide severance benefits to certain eligible employees of the Company and its subsidiaries upon selected terminations of service. This Plan document is also the Summary Plan Description for the Plan.

**Section 1. Definitions.**

The following shall be defined terms for purposes of the Plan:

**(a)** "***Base Salary***" means a Participant's monthly base salary in effect immediately prior to the Covered Termination, ignoring any reduction made to such monthly base salary which forms the basis for Participant's termination for Good Reason, if applicable (including without limitation any cash compensation that is deferred by Participant into a Company-sponsored retirement or deferred compensation plan, exclusive of any employer matching contributions by the Company associated with any such retirement or deferred compensation plan and exclusive of any other Company contributions), and excludes all bonuses, commissions, expatriate premiums, fringe benefits (including without limitation car allowances), option grants, equity awards, employee benefits and other similar items of compensation.

**(b)** "***Board***" means the Board of Directors of the Company, or a committee or subcommittee of such Board.

**(c)** "***Bonus Amount***" means a Participant's target bonus in place in effect immediately prior to the Covered Termination, ignoring any reduction which forms the basis for Participant's termination for Good reason, if applicable.

**(d)** "***Cause***" for the Company to terminate a Participant's employment hereunder shall mean the occurrence of one or more of the following events if such event results in a demonstrably harmful impact on the Company's business or reputation, as reasonably determined by the Board:

**(1)** Participant's willful and continued failure to substantially perform his or her duties with the Company (other than any such failure resulting from incapacity due to physical or mental illness), after a written demand for substantial performance is delivered to the Participant by the Board which specifically identifies the manner in which the Board believes that the Participant has not substantially performed his or her duties. For a termination of employment to be for Cause pursuant to this subsection (2)(d)(1), the Participant must (a) receive a written notice

which indicates in reasonable detail the facts and circumstances claimed to provide a basis for the termination of his or her employment for Cause; and (b) be provided with an opportunity to be heard no earlier than 30 days following the receipt of such notice (during which notice period the Participant has the opportunity to cure and has failed to cure or resolve the behavior in question).

**(2)** Participant's conviction of, or plea of guilty or nolo contendere to, a felony or any crime involving fraud, dishonesty or moral turpitude;

**(3)** Participant's willful engaging in gross misconduct; or

**(4)** Participant's unauthorized use or disclosure of material confidential information or material trade secrets of the Company.

The determination under this Plan that a Participant's termination is with or without Cause shall be made by the Plan Administrator in good faith, and any such determination shall have no effect upon any determination of the rights or obligations of the Company or the Participant for any other purpose.

**(e)** "***Change in Control***" means the occurrence any of the following events:

**(1)** any person or group of persons acting in concert (excluding Company benefit plans) becomes the beneficial owner of securities of the Company having at least 30% of the voting power of the Company's then outstanding securities (unless the event causing the 30% threshold to be crossed is an acquisition of voting common securities directly from the Company);

**(2)** any merger or other business combination of the Company, any sale or lease of the Company's assets or any combination of the foregoing transactions (the "***Transactions***") other than a Transaction immediately following which the stockholders of the Company immediately prior to the Transaction own at least 60% of the voting power, directly or indirectly, of (A) the surviving corporation in any such merger or other business combination; (B) the purchaser or lessee of the Company's assets; or (C) both the surviving corporation and the purchaser or lessee in the event of any combination of Transactions, in each case in substantially the same proportions as their ownership of the outstanding voting securities of the Company immediately prior to such Transaction; or

**(3)** within any 24 month period, the persons who were directors immediately before the beginning of such period (the "***Incumbent Directors***") cease to constitute at least a majority of the Board or the board of directors of a successor to the Company. For this purpose, any director who was not a director at the beginning of such period shall be deemed to be an Incumbent Director if such director was elected to the Board by, or on the recommendation of or with the approval of, at least three-quarters of the directors who then qualified as Incumbent Directors (so long as such director was not nominated by a person who has expressed an intent to effect a Change in Control or engage in a proxy or other control contest).

**(f)** "***Change in Control Protection Period***" means the period commencing upon a Change in Control and ending 24 months following such Change in Control.

**(g)** "***Change in Control Termination***" means a Participant's Covered Termination that occurs during the Change in Control Protection Period.

**(h)** "***Code***" means the Internal Revenue Code of 1986, as amended.

**(i)** "***Company***" means Arena Pharmaceuticals, Inc. and its successors and assigns.

**(j)** "***Covered Termination***" means, with respect to a Participant who immediately prior to a termination of employment was an employee of the Company, such Participant's termination of employment by the Company without Cause or such Participant's voluntary termination with Good Reason (excluding terminations due to Disability or death).

**(k)** "***Disability***" means, with respect to a Participant, the inability of such Participant to perform satisfactorily all of the Participant's usual services for the Company because the Participant has become permanently disabled within the meaning of any policy of disability income insurance covering employees of the Company then in force. In the event the Company has no policy of disability income insurance covering employees of the Company in force when the Participant becomes disabled, then such term shall mean the Participant's permanent and total disability within the meaning of Section 22(e)(3) of the Code.

**(l)** "***Good Reason***" means, with respect to a Participant, any one of the following:

**(1)** any reduction in Participant's annual base salary (except for salary decreases generally applicable to the Company's other similarly-situated employees);

**(2)** any material reduction in the Participant's target bonus level or bonus opportunities;

**(3)** Participant's authority, duties or responsibilities are materially diminished including any change in Participant's position such that Participant is no longer employed in substantially the same position and with substantially the same level of authority, responsibilities or duties at the ultimate parent corporation in an affiliated group of companies;

**(4)** any significant reduction, in the aggregate, in the employee benefit programs made available to the Participant other than a reduction in such employee benefit programs affecting all employees of the Company substantially equally;

**(5)** the relocation without Participant's prior written approval of the Participant's principal office or place of business to a location that would cause an increase by more than twenty (20) miles in the Participant's one-way commuting distance from the Participant's principal personal residence to the principal office or business location at which the Participant is required to perform services, except for required travel for the Company's business to an extent substantially consistent with the Participant's prior business travel obligations; or

**(6)** the failure of the Company to obtain a satisfactory agreement from any successor to assume and agree to perform under the terms of the Plan.

The determination under this Plan that a Participant's termination is with or without Good Reason shall be made by the Plan Administrator in good faith, and any such determination shall have no effect upon any determination of the rights or obligations of the Company or the Participant for any other purpose. Participant's continued employment shall not constitute consent to, or a waiver of rights with respect to, any circumstances constituting Good Reason hereunder.

**(m)** "***Participant***" means each individual employed by the Company with the title of Executive Vice President or Senior Vice President who has been provided with a Participation Notice and a copy of which the Participant has executed and delivered to the Company.

**(n)** "***Participation Notice***" means the notice delivered by the Company to a Participant informing the Participant of his or her eligibility to participate in the Plan and applicable Severance Period, substantially in the form attached hereto as **Exhibit A**.

**(o)** "***Plan Administrator***" means Arena Pharmaceuticals, Inc.

**(p)** "***Severance Period***" means, with respect to a Participant, the number of months following the Participant's Covered Termination for which a Participant may be eligible to receive the benefits provided in Section 3 herein. The Severance Period applicable to a Participant is set forth on the Participation Notice delivered to the Participant.

**Section 2. Eligibility for Benefits.**

Subject to the requirements set forth in this Section, the Company shall provide severance benefits under the Plan to the Participants. In order to be eligible to receive benefits under the Plan, a Participant must (i) experience a Covered Termination (ii) execute a general waiver and release in substantially the form attached hereto as **Exhibit B** within the applicable time period set forth therein, but in no event later than sixty (60) days following termination of the Participant's employment, and provided that such release becomes effective, and (iii) return all Company-owned property to the Company as instructed by the Company. The Company shall provide the form of such release to the Participant on, or within a reasonable time after, the termination of the Participant's employment. The Company, in its sole discretion, may at any time modify the forms of the required release to effect a release of claims consistent with this Section 3. In the event that a Participant's employment is terminated as a result of such Participant's death or Disability, then such Participant shall not be entitled to the benefits provided in this Plan.

**Section 3. Amount of Benefit.**

Subject to the limitations and reductions provided in this Plan, benefits under this Plan, if any, shall be provided to the Participants described in Section 3 in the following amounts:

**(a)** **Covered Termination Benefits**. Upon a Participant's Covered Termination, such Participant shall receive the following severance package:

**(1)** *Cash Severance Benefits*. Within five business days after the earlier of (i) the Participant's death or (ii) the first business day that is six months following the Covered Termination, such Participant will receive a cash payment in an amount equal to the sum of

Participant's Base Salary and Bonus Amount multiplied by the number of months in the Participant's Severance Period.

**(2)** *COBRA Benefits*. If such Participant timely elects to continue coverage under the Consolidated Omnibus Budget Reconciliation Act of 1985, as amended ("***COBRA***"), then the Company will directly pay all COBRA group health insurance premiums for Participant until the earliest of (A) the end of the Severance Period or (B) the expiration of Participant's eligibility for the continuation coverage under COBRA. For purposes of this Section, references to COBRA premiums shall not include any amounts payable by Participant under a Code Section 125 health care reimbursement plan. Notwithstanding the foregoing, if at any time the Plan Administrator determines, in its sole discretion, that it cannot pay the COBRA premiums without potentially incurring financial costs or penalties under applicable law (including, without limitation, Section 2716 of the Public Health Service Act), then regardless of whether Participant elects continued health coverage under COBRA, and in lieu of providing the COBRA premiums, the Company will instead pay Participant on the last day of each remaining month of the Severance Period, a fully taxable cash payment equal to 140% of (x) the value of Participant's last monthly group health insurance premiums immediately prior to the Covered Termination or (y) the value of Participant's last monthly COBRA premiums paid by the Company, as applicable (dependent on the time the Plan Administrator makes such determination that it cannot pay the COBRA premiums directly), and in either case subject to applicable tax withholdings (such amount, the "***Health Care Benefit Payment***"). The Health Care Benefit Payment shall be paid in monthly installments on the same schedule that the COBRA premiums would otherwise have been paid and shall be paid until the earlier of (i) expiration of the Severance Period or (ii) the date Participant is no longer enrolled in such COBRA coverage.

**(3)** *Equity Acceleration and Continued Stock Option Post-Termination Exercise Period*. The Participant will receive immediate vesting of all stock options and other equity awards issued by the Company and held by such Participant that would have vested had the Participant remained employed by the Company through the end of the Severance Period, provided that, for purposes of calculating such vesting acceleration, any unvested portion of equity awards held by the Participant that are scheduled to vest in one or more annual installments shall be treated as if the original grant provided for vesting in equal monthly installments rather than annually. In addition, with respect to stock options granted to the Participant, the Participant shall be entitled to exercise all of his or her vested stock options until the later of (i) the original post-termination exercise period provided in such Participant's stock option agreement or (ii) the number of months equal to the Severance Period (but not beyond the original contractual life of the option). Notwithstanding any other provision of the Plan to the contrary, the Plan shall not affect (including with respect to vesting) any stock awards for which the vesting thereof is conditioned upon the satisfaction of performance criteria ("***Performance-Related Awards***"), including any such grants under the Company's Performance Restricted Stock Unit Grant Agreement. For the avoidance of doubt, Performance-Related Awards do not include any stock awards or portions thereof (including stock options) for which the vesting thereof is conditioned solely upon Participant's continued service over a specified time period (i.e., time-based vesting). All cash severance payment referenced in this Section 4 shall be subject to all applicable tax withholdings and deductions required by law. Except as provided herein, all terms, conditions and limitations applicable to a Participant's stock options and/or equity awards shall remain in full force and effect.

5.

**(b) Change in Control Termination Benefits**. Upon a Change in Control Termination, all of such Participant's outstanding stock options and other equity awards issued by the Company and held by such Participant as of the Change in Control Termination shall become fully vested and exercisable in full, except that this provision shall not affect any Performance-Related Awards, including any such grants under the Company's Performance Restricted Stock Unit Grant Agreement, which are not eligible to accelerate vesting under the Plan. For the avoidance of doubt, any stock options which accelerate vesting pursuant to the foregoing provision are exercisable for the applicable period specified in Section 3(a).

**(c) Certain Reductions**. Notwithstanding any other provision of the Plan to the contrary, any benefits payable to a Participant under Sections 4(a)(1) and 4(a)(2) of this Plan shall be reduced (but not below zero) by any severance benefits payable by the Company or an affiliate of the Company to such Participant under any other policy, plan, program, agreement or arrangement, including, without limitation, an employment agreement or Termination Protection Agreement between such Participant and the Company. In addition, to the extent that any federal, state or local laws, including, without limitation the Worker Adjustment Retraining Notification Act, 29 U.S.C. Section 2101 et seq., or any similar state statute, require the Company to give advance notice or make a payment of any kind to a Participant because of that Participant's involuntary termination due to a layoff, reduction in force, plant or facility closing, sale of business, change of control, or any other similar event or reason, the benefits payable under Sections 4(a)(1) and 4(a)(2) of this Plan shall be reduced (but not below zero) by such required payments or notice. The benefits provided under this Plan are intended to satisfy any and all statutory obligations that may arise out of a Participant's involuntary termination of employment for the foregoing reasons, and the Plan Administrator shall so construe and implement the terms of the Plan.

**Section 4. Limitations on Benefits.**

**(a) Mitigation**. Except as otherwise specifically provided herein, a Participant shall not be required to mitigate damages or the amount of any payment provided under the Plan by seeking other employment or otherwise, nor shall the amount of any payment provided for under the Plan be reduced by any compensation earned by a Participant as a result of employment by another employer or any retirement benefits received by such Participant after the date of service or employment termination.

**(b) Termination of Benefits**. Benefits under the Plan shall terminate immediately if the Participant, at any time, (i) engages in the unauthorized use or disclosure of the Company's material confidential information, material trade secrets or material proprietary information under any written agreement under which the Participant has such an obligation to the Company that survives the Participant's termination of service to the Company, (ii) engages in any prohibited or unauthorized competitive activities or solicitation or recruitment of employees, in violation of any written agreement under which Participant has such an obligation to the Company that survives the Participant's termination of service to the Company; (iii) violates any term or condition of this Plan or (iv) violates any term of the applicable general waiver and release referenced in Section 3 above.

**(c)** **Non-Duplication of Benefits**. No Participant is eligible to receive benefits under this Plan more than one time.

**(d)** **Indebtedness of Participants**. If a Participant is indebted to the Company or an affiliate of the Company on the date of his or her termination of employment or service, the Company reserves the right to offset any severance benefits payable in cash under the Plan by the amount of such indebtedness.

**(e)** **Parachute Payments**. If any payment or benefit a Participant would receive in connection with a change in control from the Company or otherwise (a "***Payment***") would (i) constitute a "parachute payment" within the meaning of Section 280G of the Code, and (ii) but for this sentence, be subject to the excise tax imposed by Section 4999 of the Code (the "***Excise Tax***"), then such Payment shall be equal to the Reduced Amount. The "***Reduced Amount***" shall be either (x) the largest portion of the Payment that would result in no portion of the Payment being subject to the Excise Tax or (y) the largest portion of the Payment, up to and including the total Payment, whichever amount, after taking into account all applicable federal, state and local employment taxes, income taxes, and the Excise Tax (all computed at the highest applicable marginal rate), results in the Participant's receipt, on an after-tax basis, of the greater amount of the Payment notwithstanding that all or some portion of the Payment may be subject to the Excise Tax. If a reduction in payments or benefits constituting "parachute payments" is necessary so that the Payment equals the Reduced Amount, reduction shall occur in the following order: reduction of cash payments; cancellation of accelerated vesting of stock awards; reduction of employee benefits. If acceleration of vesting of stock award compensation is to be reduced, such acceleration of vesting shall be cancelled in the reverse order of the date of grant of the Participant's stock awards. Notwithstanding the foregoing, to the extent that it is permitted under Sections 409A, 280G and 4999 of the Code, the Participant may designate a different order of reduction in payments or benefits constituting "parachute payments".

The Company shall appoint a nationally recognized independent accounting firm to make the determinations required hereunder, which accounting firm shall not then be serving as accountant or auditor for the individual, entity or group that effected the Change in Control. The Company shall bear all expenses with respect to the determinations by such accounting firm required to be made hereunder.

The accounting firm engaged to make the determinations hereunder shall provide its calculations, together with detailed supporting documentation, to the Company and the Participant within ten (10) calendar days after the date on which the Participant's right to a Payment is triggered (if requested at that time by the Company or the Participant) or such other time as requested by the Company or the Participant. If the accounting firm determines that no Excise Tax is payable with respect to a Payment, either before or after the application of the Reduced Amount, it shall furnish the Company and the Participant with an opinion reasonably acceptable to the Participant that no Excise Tax will be imposed with respect to such Payment. Any good faith determinations of the accounting firm made hereunder shall be final, binding and conclusive upon the Company and the Participant.

**Section 5. Right to Interpret Plan; Amendment and Termination; Deferred Compensation.**

**(a) Exclusive Discretion**. The Plan Administrator shall have the exclusive discretion and authority to establish rules, forms, and procedures for the administration of the Plan and to construe and interpret the Plan and to decide any and all questions of fact, interpretation, definition, computation or administration arising in connection with the operation of the Plan, including, but not limited to, the eligibility to participate in the Plan and amount of benefits paid under the Plan. The rules, interpretations, computations and other actions of the Plan Administrator shall be binding and conclusive on all persons. Unless otherwise determined by the Board, the General Counsel of the Company shall perform the duties of the Plan Administrator under this Plan.

**(b) Amendment**. The Board reserves the right to amend this Plan or the benefits provided hereunder at any time; provided, however, that no such amendment shall impair or reduce the rights of a Participant unless such Participant consents to such amendment of the Plan in writing.

**(c) Term of Plan**. Notwithstanding the foregoing, the Plan and each Participant's participation herein shall continue in effect through December 31, 2019; *provided, however*, that the term of this Plan and such participation shall automatically be extended for one additional year beyond December 31, 2019 and for successive one year periods thereafter, unless, not later than January 30 of each calendar year, commencing in 2019 for the 2022 calendar year (e.g., 2020 for the 2023 calendar year, 2021 for the 2024 calendar year, etc.), the Company shall have given written notice that it does not wish to extend this Plan or a Participant's right to participate hereunder for an additional year, in which event this Plan (or such Participant's participation, as the case may be) shall continue to be effective until December 31 of the applicable calendar year; *provided, further*, that, notwithstanding any such notice by the Company not to extend, if a Change in Control shall have occurred during the original or any extended term of this Plan, this Agreement shall remain in effect for a period of two (2) years after such Change in Control. For the avoidance of doubt, any termination of the Plan which is effected in accordance with the terms of this Section 5(c) shall not constitute "Good Reason" for any Participant's resignation.

**(d) Deferred Compensation**. Notwithstanding anything to the contrary set forth herein, any payments and benefits provided under this Plan (the "***Severance Benefits***") that constitute "deferred compensation" within the meaning of Section 409A of the Code and the regulations and other guidance thereunder and any state law of similar effect (collectively "***Section 409A***") shall not commence in connection with a Participant's termination of employment unless and until the Participant has also incurred a "separation from service" (as such term is defined in Treasury Regulation Section 1.409A-1(h) ("***Separation From Service***"), unless such amounts may be provided to the Participant without causing the Participant to incur the additional 20% tax under Section 409A.

It is intended that, if the Company (or, if applicable, the successor entity thereto) reasonably determines that the Severance Benefits constitute "deferred compensation" under Section 409A and the Participant is, on the termination of Executive's service, a "specified employee" of the Company or any successor entity thereto, as such term is defined in Section 409A(a)(2)(B)(i) of

the Code, the timing of the Severance Benefit payment complies with the payment limitation applicable to such employees contained in Section 409A(a)(2)(B)(i).

**(e)** **Superseding Plan.** As of the Effective Date, except for (i) any Termination Protection Agreement and (ii) any benefits provided pursuant to any applicable equity compensation plans and related grants or awards, this Plan supersedes any severance benefit plan, policy or practice previously maintained by the Company for eligible Participants, including but not limited to the Prior Plan.

**Section 6. Continuation of Certain Employee Benefits.**

**(a)** **COBRA Continuation**. Each Participant who is enrolled in a group medical, dental or vision plan sponsored by the Company or an affiliate of the Company may be eligible to continue coverage under such group medical, dental or vision plan (or to convert to an individual policy), at the time of the Participant's termination of employment under COBRA. The Company will notify the Participant of any such right to continue group medical coverage at the time of termination. No provision of this Plan will affect the continuation coverage rules under COBRA. Therefore, the period during which a Participant may elect to continue the Company's group medical, dental or vision coverage at his or her own expense under COBRA, the length of time during which COBRA coverage will be made available to the Participant, and all other rights and obligations of the Participant under COBRA will be applied in the same manner that such rules would apply in the absence of this Plan. At the conclusion of the payments made by the Company pursuant to Section 4 herein, if any, the Participant will be responsible for the entire payment of premiums required under COBRA for the duration, if any, of the COBRA period.

**(b)** **Other Employee Benefits**. All non-health benefits (such as life insurance, disability and 401(k) plan coverage) terminate as of an employee's termination date (except to the extent that a conversion privilege may be available thereunder).

**Section 7. No Implied Employment Contract.**

The Plan shall not be deemed (i) to give any employee or other person any right to be retained in the employ or service of the Company or (ii) to interfere with the right of the Company to discharge any employee or other person at any time and for any reason, which right is hereby reserved.

**Section 8. Legal Construction.**

This Plan is intended to be governed by and shall be construed in accordance with the Employee Retirement Income Security Act of 1974, as amended ("***ERISA***") and, to the extent not preempted by ERISA, the laws of the State of California.

**Section 9. Claims, Inquiries and Appeals.**

**(a)** **Applications for Benefits and Inquiries**. Any application for benefits, inquiries about the Plan or inquiries about present or future rights under the Plan must be submitted to the Plan Administrator in writing by an applicant (or his or her authorized representative). The Plan Administrator is:

Arena Pharmaceuticals, Inc.
6154 Nancy Ridge Drive
San Diego, CA 92121
Attn: General Counsel

**(b) Denial of Claims**. In the event that any application for benefits is denied in whole or in part, the Plan Administrator must provide the applicant with written or electronic notice of the denial of the application, and of the applicant's right to review the denial. Any electronic notice will comply with the regulations of the U.S. Department of Labor. The written notice of denial will be set forth in a manner designed to be understood by the employee and will include the following:

**(8)** the specific reason or reasons for the denial;

**(9)** references to the specific Plan provisions upon which the denial is based;

**(10)** a description of any additional information or material that the Plan Administrator needs to complete the review and an explanation of why such information or material is necessary; and

**(11)** an explanation of the Plan's review procedures and the time limits applicable to such procedures, including a statement of the applicant's right to bring a civil action under section 502(a) of ERISA following a denial on review of the claim, as described in Section 10(d) below.

This written notice will be given to the applicant within ninety (90) days after the Plan Administrator receives the application, unless special circumstances require an extension of time, in which case, the Plan Administrator has up to an additional ninety (90) days for processing the application. If an extension of time for processing is required, written notice of the extension will be furnished to the applicant before the end of the initial ninety (90) day period.

This notice of extension will describe the special circumstances necessitating the additional time and the date by which the Plan Administrator is to render its decision on the application.

**(c) Request for a Review**. Any person (or that person's authorized representative) for whom an application for benefits is denied, in whole or in part, may appeal the denial by submitting a request for a review to the Plan Administrator within sixty (60) days after the application is denied. A request for a review shall be in writing and shall be addressed to:

Arena Pharmaceuticals, Inc.
6154 Nancy Ridge Drive
San Diego, CA 92121
Attn: General Counsel

A request for review must set forth all of the grounds on which it is based, all facts in support of the request and any other matters that the applicant feels are pertinent. The applicant (or his or her representative) shall have the opportunity to submit (or the Plan Administrator may require the applicant to submit) written comments, documents, records, and other information

relating to his or her claim. The applicant (or his or her representative) shall be provided, upon request and free of charge, reasonable access to, and copies of, all documents, records and other information relevant to his or her claim. The review shall take into account all comments, documents, records and other information submitted by the applicant (or his or her representative) relating to the claim, without regard to whether such information was submitted or considered in the initial benefit determination.

**(d) Decision on Review**. The Plan Administrator will act on each request for review within sixty (60) days after receipt of the request, unless special circumstances require an extension of time (not to exceed an additional sixty (60) days), for processing the request for a review. If an extension for review is required, written notice of the extension will be furnished to the applicant within the initial sixty (60) day period. This notice of extension will describe the special circumstances necessitating the additional time and the date by which the Plan Administrator is to render its decision on the review. The Plan Administrator will give prompt, written or electronic notice of its decision to the applicant. Any electronic notice will comply with the regulations of the U.S. Department of Labor. In the event that the Plan Administrator confirms the denial of the application for benefits in whole or in part, the notice will set forth, in a manner calculated to be understood by the applicant, the following:

**(1)** the specific reason or reasons for the denial;

**(2)** references to the specific Plan provisions upon which the denial is based;

**(3)** a statement that the applicant is entitled to receive, upon request and free of charge, reasonable access to, and copies of, all documents, records and other information relevant to his or her claim; and

**(4)** a statement of the applicant's right to bring a civil action under section 502(a) of ERISA.

**(e) Rules and Procedures**. The Plan Administrator will establish rules and procedures, consistent with the Plan and with ERISA, as necessary and appropriate in carrying out its responsibilities in reviewing benefit claims. The Plan Administrator may require an applicant who wishes to submit additional information in connection with an appeal from the denial of benefits to do so at the applicant's own expense.

**(f) Exhaustion of Remedies**. No legal action for benefits under the Plan may be brought until the claimant (i) has submitted a written application for benefits in accordance with the procedures described by Section 10(a) above, (ii) has been notified by the Plan Administrator that the application is denied, (iii) has filed a written request for a review of the application in accordance with the appeal procedure described in Section 10(c) above, and (iv) has been notified in writing that the Plan Administrator has denied the appeal. Notwithstanding the foregoing, if the Plan Administrator does not respond to a Participant's claim or appeal within the relevant time limits specified in this Section 10, then the Participant may bring legal action for benefits under the Plan pursuant to Section 502(a) of ERISA.

**Section 10. Basis of Payments To and From Plan.**

11.

All benefits under the Plan shall be paid by the Company. The Plan shall be unfunded, and benefits hereunder shall be paid only from the general assets of the Company.

**Section 11. Other Plan Information.**

**(a) Employer and Plan Identification Numbers**. The Employer Identification Number assigned to the Company (which is the "***Plan Sponsor***" as that term is used in ERISA) by the Internal Revenue Service is 23-2908305. The Plan Number assigned to the Plan by the Plan Sponsor pursuant to the instructions of the Internal Revenue Service is 501.

**(b) Ending Date for Plan's Fiscal Year**. The date of the end of the fiscal year for the purpose of maintaining the Plan's records is December 31.

**(c) Agent for the Service of Legal Process**. The agent for the service of legal process with respect to the Plan is Arena Pharmaceuticals, Inc., Attn: General Counsel, 6154 Nancy Ridge Drive, San Diego, CA 92121.

**(d) Plan Sponsor and Administrator**. The "***Plan Sponsor***" and the "***Plan Administrator***" of the Plan is Arena Pharmaceuticals, Inc., 6154 Nancy Ridge Drive, San Diego, CA 92121. The Plan Sponsor's and Plan Administrator's telephone number is (858) 453-7200. The Plan Administrator is the named fiduciary charged with the responsibility for administering the Plan.

**Section 12. Statement of ERISA Rights.**

Participants in this Plan (which is a welfare benefit plan sponsored by the Company) are entitled to certain rights and protections under ERISA. If you are a Participant in the Plan, under ERISA you are entitled to:

**Receive Information about the Plan and Your Benefits**

**(a)** Examine, without charge, at the Plan Administrator's office and at other specified locations, such as work sites, all documents governing the Plan and a copy of the latest annual report (Form 5500 Series) filed by the Plan Administrator with the U.S. Department of Labor and available at the Public Disclosure Room of the Pension and Welfare Benefit Administration;

**(b)** Obtain, upon written request to the Plan Administrator, copies of documents governing the operation of the Plan and copies of the latest annual report (Form 5500 Series). The Plan Administrator may make a reasonable charge for the copies; and

**(c)** Receive a summary of the Plan's annual financial report. The Plan Administrator is required by law to furnish each Participant with a copy of this summary annual report.

**Prudent Actions by Plan Fiduciaries**

In addition to creating rights for Plan participants, ERISA imposes duties upon the people who are responsible for the operation of the employee benefit plan. The people who operate the

Plan, called "fiduciaries" of the Plan, have a duty to do so prudently and in the interest of you and other Plan participants and beneficiaries.

**Enforce Your rights**

No one, including your employer or any other person, may fire you or otherwise discriminate against you in any way to prevent you from exercising your rights under ERISA.

Under ERISA, there are steps you can take to enforce the above rights. For instance, if you request a copy of Plan documents or the latest annual report from the Plan and do not receive them within 30 days, you may file suit in a Federal court. In such a case, the court may require the Plan Administrator to provide the materials and pay you up to $110 a day until you receive the materials, unless the materials were not sent because of reasons beyond the control of the Plan Administrator.

If you have a claim for benefits that is denied or ignored, in whole or in part, you may file suit in a state or Federal court.

If you are discriminated against for asserting your rights, you may seek assistance from the U.S. Department of Labor, or you may file suit in a Federal court. The court will decide who should pay court costs and legal fees. If you are successful, the court may order the person you have sued to pay these costs and fees. If you lose, the court may order you to pay these costs and fees, for example, if it finds your claim is frivolous.

**Assistance with Your Questions**

If you have any questions about the Plan, you should contact the Plan Administrator. If you have any questions about this statement or about your rights under ERISA, or if you need assistance in obtaining documents from the Plan Administrator, you should contact the nearest office of the Pension and Welfare Benefits Administration, U.S. Department of Labor, listed in your telephone directory or the Division of Technical Assistance and Inquiries, Pension and Welfare Benefits Administration, U.S. Department of Labor, 200 Constitution Avenue N.W., Washington, D.C. 20210. You may also obtain certain publications about your rights and responsibilities under ERISA by calling the publications hotline of the Pension and Welfare Benefits Administration.

**Section 13. Execution.**

To record the adoption of the Plan as amended as set forth herein, effective as of the Effective Date, Arena Pharmaceuticals, Inc. has caused its duly authorized officer to execute the same this 4th day of January, 2019.

Arena Pharmaceuticals, Inc.

/s/ Amit Munshi
Amit Munshi, President and Chief Executive Officer

EXHIBIT A

**Arena Pharmaceuticals, Inc.**

**Amended and Restated Severance Benefit Plan**
**Participation Notice**

To:

Date:

Arena Pharmaceuticals, Inc. (the "***Company***") adopted the Arena Pharmaceuticals, Inc. Amended and Restated Severance Benefit Plan effective on January 4, 2019 (the "***Plan***"). Capitalized terms used in this Participation Notice have the meanings set forth in the Plan. The Company is providing you with this Participation Notice reflecting your designated Severance Period for purposes of your eligibility to participate in the Plan:

The terms and conditions of your participation in the Plan are as set forth in the Plan and this Participation Notice, which together constitute the Summary Plan Description for the Plan. By executing this Participation Notice you hereby acknowledge and agree that, except for (i) any Termination Protection Agreement and (ii) any benefits provided pursuant to any applicable equity compensation plans, as of the Effective Date, the terms of the Plan and this Participation Notice supersede and replace any rights to benefits that you may have had under any severance benefit plan, policy or practice previously maintained by the Company, including but not limited to the Prior Plan, if applicable. To reflect your acceptance of the terms of the Plan and this Participation Notice, please return to the Company's head of Human Resources a copy of this Participation Notice signed by you and retain a copy of this Participation Notice, along with the Plan document, for your records

**Arena Pharmaceuticals, Inc.**

*(Signature)*

Name:

Title:

**Participant:**

*(Signature)*

Name:

Date:

**EXHIBIT B**

**RELEASE AGREEMENT**

**I understand and agree completely to the terms set forth in the Arena Pharmaceuticals, Inc. Amended and Restated Severance Benefit Plan (the "*Plan*"). I understand that this release and waiver (the "*Release*"), together with the Plan, constitutes the complete, final and exclusive embodiment of the entire agreement between the Company and me with regard to the subject matter hereof. I am not relying on any promise or representation by the Company that is not expressly stated herein or in the Plan.**

In consideration of benefits I will receive under the Plan, I hereby generally and completely release the Company and its directors, officers, employees, agents, attorneys, predecessors, successors, parent and subsidiary entities, insurers, and affiliates from any and all claims, liabilities and obligations, both known and unknown, that arise out of or are in any way related to (i) my employment, (ii) the termination of my employment or (iii) events, acts, conduct, or omissions between the Company and me occurring prior to my signing this Release, except for claims for benefits set forth in the Plan, any Termination Protection Agreement, any applicable equity compensation plans and related grants or awards, any applicable indemnification agreement or other indemnification obligation under the Company's charter documents, or any rights or claims I may have to indemnification or legal defense pursuant to any policy of insurance protecting or applicable to directors and/or officers of the Company and any rights or claims which are not waivable as a matter of law. Subject to the foregoing, this Release includes, but is not limited to: (1) all claims arising out of or in any way related to my employment with the Company or the termination of that employment; (2) all claims related to my compensation or benefits from the Company, including, but not limited to, salary, bonuses, commissions, vacation pay, expense reimbursements, severance pay, fringe benefits, stock, stock options, or any other ownership interests in the Company; (3) all claims for breach of contract, wrongful termination, and breach of the implied covenant of good faith and fair dealing; (4) all tort claims, including, but not limited to, claims for fraud, defamation, emotional distress, and discharge in violation of public policy; and (5) all federal, state, and local statutory claims, including, but not limited to, claims for discrimination, harassment, retaliation, attorneys' fees, or other claims arising under the federal Civil Rights Act of 1964 (as amended), the federal Americans with Disabilities Act of 1990, the federal Age Discrimination in Employment Act of 1967 (as amended) ("***ADEA***"), and the California Fair Employment and Housing Act (as amended).

I acknowledge that the consideration given under the Release for the waiver and release in the preceding paragraph hereof is in addition to anything of value to which I was already entitled.

If I am over the age of 40 years at the time of an Covered Termination (as that term is defined in the Plan), I acknowledge that I am knowingly and voluntarily waiving and releasing any rights I may have under the ADEA. I further acknowledge that I have been advised by this writing, as required by the ADEA, that: (A) my waiver and release do not apply to any rights or claims that may arise on or after the date I execute this Release; (B) I should consult with an attorney prior to executing this Release; (C) I have twenty-one (21) days (or such greater time as may be required by law) to consider this Release (although I may choose to voluntarily execute

this Release earlier); (D) I have seven (7) days following my execution of this Release to revoke the Release; and (E) this Release shall not be effective until the date upon which the revocation period has expired, which shall be the eighth (8th) day after I execute this Release.

If I am not over the age of 40 years at the time of an Covered Termination (as that term is defined in the Plan), I understand and agree that I will have ten days to consider and execute this release and that it shall be effective upon such execution.

Except if prohibited by law or regulation, (i) I represent that I have not filed any claims against the Company and agree that I will not file any claim against the Company or seek any compensation for any claim other than the payments and benefits referenced herein and (ii) I agree to indemnify and hold the Company harmless from and against any and all loss, cost, and expense, including, but not limited to court costs and attorney's fees, arising from or in connection with any action which may be commenced, prosecuted, or threatened by me or for my benefit, upon my initiative, or with my voluntary aid or approval, contrary to the provisions of this Release.

I acknowledge that I have read and understand Section 1542 of the California Civil Code which reads as follows: "**A general release does not extend to claims which the creditor does not know or suspect to exist in his or her favor at the time of executing the release, which if known by him or her must have materially affected his or her settlement with the debtor**." I hereby expressly waive and relinquish all rights and benefits under that section and any law of any jurisdiction of similar effect with respect to my release of any claims I may have against the Company, its affiliates, and the entities and persons specified above.

The provisions of the Release shall be deemed severable, and the invalidity or unenforceability of any provision hereof shall not affect the validity or enforceability of the other provisions hereof, and, to the greatest extent legally possible, effect shall be given to the intent manifested by the portion held invalid or inoperative.

The Release shall become binding when signed by the Participant, and may be executed by facsimile or a PDF sent by email.

**EMPLOYEE**

_____

Print Name:_____

Date:_____

**Exhibit 10.28**

# Arena Pharmaceuticals, Inc.

-- Annual Incentive Plan --

*Revised on February 11, 2019*

## Annual Incentive Plan – Overview

**Overview**

- Each participant is assigned an incentive target, expressed as a percentage of annual base salary.

- The Compensation Committee assigns corporate goals and, at the discretion of the Compensation Committee, individual goals. The corporate and/or individual goals are individually weighted and may include subparts. The categories of goals are set forth in Annex I.
  - Goals will be specific and measurable, but there may be subjectivity in scoring some corporate or individual goals.
- All participants have the same corporate goals, which aligns their interests with one another and stockholders.

- At the end of the applicable fiscal year, individual incentive awards are determined by the Compensation Committee based upon the level of goal achievement, the quality of achievement, the participant's role in goal achievement, the weighting of each goal, the importance of the goal to the Company's current and future success, and/or such factors relevant to the goal achievement that the Compensation Committee believes is appropriate. The "applicable fiscal year" means the year within which the goals are required to be achieved.
- The Compensation Committee has the discretion to decrease (including to zero) any participant's award or to increase any participant's award up to 150% of their target bonus.

**Individual Incentive Targets**

- **Annual Targets:** Target incentives for each participant shall be based on participant's position and the market. The target annual incentive for the CEO and all Executive Vice Presidents ("EVPs") shall be approved by the Compensation Committee at the time of hire and be subject to subsequent modification at the Compensation Committee's discretion. For newly hired participants, the effective date shall be the first of the month following the participant's date of hire and shall be prorated for the first year of employment, unless otherwise stipulated in the participant's offer letter. For participants whose date of hire is after September 30, the effective date of the target bonus shall be January 1 of the following year, unless otherwise stipulated in the participant's offer letter. Once determined, a participant's target annual incentive will continue unless and until changed by the Compensation Committee.

**Changes:** Any changes to a participant's target annual incentive approved by the Compensation Committee as part of the annual executive compensation review, generally completed in the first calendar quarter of the year, shall be effective January 1 of the calendar year in which the change is approved. For changes approved outside the annual executive compensation review, the effective date shall be the date the change is approved by the Compensation Committee and any change shall be prorated for the period of the year in effect.

## Annual Incentive Plan – Funding

**Cap**

- Total award funding is capped at 150% of target goal achievement.

**Funding Relationship**

- Subject to other provisions of this plan, the funded award will be based on the goal completion percentage.
  - For example, if goal completion is 95% of the total target, then the award would fund at 95% of target (subject to the approval of the Compensation Committee and any adjustments under this plan).

**Discretionary Adjustment**

- The Compensation Committee may use its judgment and discretion to modify or adjust the annual incentive awards as provided in this plan, subject to the 150% of target maximum payout.

## Rules Governing the Plan

- Eligible plan participants must be actively employed at Arena on the date the annual award is paid. Plan participants who are not employed on the payment date are not eligible to receive an award.
- Eligible plan participants whose first date of employment or of eligibility is between January 1 and September 30 of the applicable fiscal year will participate on a prorated as reflected above.
- Payment of an incentive to eligible plan participants who take a leave of absence for any reason during the applicable fiscal year may be prorated based on the time worked during such year.
- The Compensation Committee and the Board each has the right to exclude participants and exercise discretion, including canceling the plan or any earned awards.
- Awards under this plan to U.S. based participants will be paid prior to March 15 of the year following the applicable fiscal year.
- Participation in the Annual Incentive Plan is not a guarantee of continued employment. Arena reserves the right to terminate employment and/or participation in the Annual Incentive Plan at any time and for any reason.
- The Compensation Committee and the Board each reserve the right to change or waive any provision in the incentive plan at any time, including (but not limited to) its award formula, performance measures and payout schedule. Although Arena intends to pay incentives at levels indicated by the plan, this plan shall not obligate Arena to grant the benefits contemplated under its provisions.
- This plan is not a contract and in no way represents a contractual obligation to pay any amount under the plan, regardless of the performance achieved during the applicable fiscal year.

## Annex I

The goals relate to the following categories:

(i) plans and progress relating to research, development and commercialization;

(ii) licensing and collaboration efforts;

(iii) budget and finance; and

(iv) human resources and people.

**Exhibit 10.33**

**[Eisai Letterhead]**

October 5, 2018

356 Royalty Inc.
6154 Nancy Ridge Drive
San Diego, CA 92121
Attention: Amit D. Munshi

**Re: Amendment to Transaction Agreement**

Dear Mr. Munshi:

Eisai Inc. and Eisai Co., Ltd. (collectively, "**Eisai**") and 356 Royalty Inc. ("**Arena**") are parties to that certain Transaction Agreement, dated as of December 28, 2016, as amended pursuant to Amendment No. 1 to Transaction Agreement dated as of March 9, 2018 (the "**Transaction Agreement**"). Capitalized terms used but not defined in this letter agreement shall have the meaning set forth in the Transaction Agreement.

Arena hereby irrevocably waives Arena's rights and Eisai's obligations under Section 4.7 of the Transaction Agreement with respect to Competing Products sold by or on behalf of Eurofarma Laboratórios S.A. or any of its Affiliates (collectively "**Eurofarma**") in the Waived Territory; provided, that Eisai or one of its Affiliates enters into a distribution or (sub)license agreement with Eurofarma with respect to the Products in the Waived Territory within six (6) months after the date of this letter agreement. "**Waived Territory**" means Argentina, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, El Salvador, Ecuador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay and Venezuela.

Arena acknowledges and agrees that the filing of an NDA, a BLA or any equivalent thereof for, or the marketing, promoting, detailing, offering for sale, selling or distributing or conducting other similar activities related to the commercial sale of, a Competing Product by or on behalf of Eurofarma in the Waived Territory shall not violate the terms of Section 4.7 of the Transaction Agreement ; provided, that Eisai or one of its Affiliates enters into a distribution or (sub)license agreement with Eurofarma with respect to the Products in the Waived Territory within six (6) months after the date of this letter agreement.

Eisai agrees to ensure agreements between Eisai (or any Eisai Affiliate) and a Distributor or Sublicensee, and any agreements between an Eisai Related Party and any additional Co-Promotion Partners, Sublicensees or Distributors, entered into after the date of this letter agreement allow for Arena to be promptly provided a reasonably redacted copy of such agreements, and Eisai will provide Arena a copy of any such agreement promptly after it is entered. In addition, Eisai will promptly provide Arena a reasonably redacted copy of its previously entered agreement with CY Biotech relating to China (including Hong Kong and Macao).

Without limiting the foregoing, if an agreement is entered with Eurofarma relating to the Waived Territory, Eisai will promptly provide a reasonably redacted copy of such agreement with Eurofarma.

Eisai agrees a copy of an agreement required to be provided to Arena shall not redact any financial or other terms reasonably related to Arena's rights or obligations under the Transaction Agreement, and a copy of any agreement that does redact such information is not a reasonably redacted copy. Arena agrees copies of any such agreements with an Eisai Related Party constitute Confidential Information.

The Transaction Agreement is hereby deemed amended in accordance with Section 15.6 of the Transaction Agreement to include the terms of this letter agreement.

This letter agreement and all questions regarding its existence, validity, interpretation, breach or performance, shall be governed by, and construed and enforced in accordance with, the laws of the State of New York, United States, without reference to its conflicts of law principles with the exception of sections 5-1401 and 5-1402 of New York General Obligations Law.

This letter agreement may be executed in any number of counterparts each of which shall be deemed an original, and all of which together shall constitute one and the same instrument. This letter agreement may be executed by facsimile or other electronic signatures and such signatures shall be deemed to bind each Party as if they were original signatures.

Please confirm your agreement with the foregoing by signing in the space provided below and returning a fully executed copy of this letter agreement to Eisai.

***Signature Page Follows***

Very truly yours,

Eisai Inc.

By: /s/ Alexander Scott
Name: Alexander Scott
Title: Chief Strategy Officer, NBG

Eisai Co., Ltd.

By: /s/ Ivan Cheung
Name: Ivan Cheung
Title: Corporate Officer, Senior Vice President

**AGREED:**

356 Royalty Inc.

By: /s/ Amit D. Munshi
Name: Amit D. Munshi
Title: President and Chief Executive Officer

**Exhibit 10.45**

**Arena Pharmaceuticals, Inc., 2017 Long-Term Incentive Plan**

**Performance Restricted Stock Unit Grant Agreement**

**THIS GRANT AGREEMENT** (this "Agreement"), effective as of _____ (the "Grant Date"), is entered into by and between Arena Pharmaceuticals, Inc., a Delaware corporation (the "Company"), and _____ (the "Participant") and evidences the terms of the Company's grant to the Participant of a performance restricted stock unit ("PRSU") award on the terms and conditions set forth herein (the "Award").

**1. Threshold, Target and Maximum Number of PRSUs under the Award.** The Award is for the below Target PRSUs, with potential to earn 50% of Target PRSUs upon a designated threshold level of performance below target and additional PRSUs upon a designated level of performance above target, in all cases up to the maximum number of PRSUs equal to 200% of Target PRSUs, subject to the conditions and adjustments specified herein, including the Award Determination, Vesting and Issuance Criteria attached as Attachment I to this Agreement (the "Vesting and Issuance Criteria"). Each PRSU represents the right to potentially be issued one Share on a future date.

Number of PRSUs at target performance: ("Target PRSUs")

**2. Subject to the Plan.** This Agreement is subject to the provisions of the Arena Pharmaceuticals, Inc., 2017 Long-Term Incentive Plan (the "Plan"). Certain terms are defined in this Agreement, and, unless the context requires otherwise, other capitalized terms used herein shall have the same meaning as in the Plan. Except as provided herein, in the event of a conflict between the provisions of the Plan and this Agreement, the Plan shall control.

**3. Account.** The Company shall credit to a bookkeeping account (the "Account") maintained by the Company for the Participant's benefit the Maximum PRSUs. On each date that cash dividends are paid on the Shares, the Company will credit the Account with a number of additional PRSUs equal to the result of dividing (i) the product of the Maximum PRSUs credited to the Account on the record date for such dividend and the per Share amount of such dividend by (ii) the Fair Market Value of one Share on the date such dividend is paid by the Company to stockholders. The additional PRSUs shall be or become vested to the same extent as the PRSUs that resulted in the crediting of such additional PRSUs, and Shares shall not be issued in settlement unless and until the underlying PRSUs vest.

**4. Vesting.** The number of PRSUs that may vest will be determined based on the Company's actual performance against the performance goals specified in the Vesting and Issuance Criteria, subject to the Participant's satisfaction of the service vesting conditions set forth therein. The Target PRSUs represent the number of PRSUs that would vest if the Participant satisfies the service vesting conditions set forth in the Vesting and Issuance Criteria and the Company achieves exactly 100% of the Company's target goal specified in the Vesting and Issuance Criteria. In no event will more than the Maximum PRSUs (plus additional PRSUs representing dividend equivalents set forth in Section 3) vest. With respect to the Participant, this

Agreement shall supersede any individually negotiated agreement with Company (or an Affiliate) and any generally applicable severance or change-in-control plan, policy, or practice, whether written or unwritten, of the Company (or an Affiliate) to the extent that such agreement, plan, policy or practice provides for vesting acceleration of equity awards.

**5.** **Capitalization Adjustments.** The number of PRSUs credited to the Account shall be equitably and appropriately adjusted as provided in Section 12.2 of the Plan.

**6.** **Termination of Employment or Service.** In the event the Participant ceases to be in the continuous service of the Company or an Affiliate as any of an Employee, a Consultant or a Director, the number of PRSUs that may vest, if at all, will be determined in accordance with the Vesting and Issuance Criteria.

**7.** **Payment of Shares.** The Company shall make a payment to the Participant of Shares based on the number of the vested PRSUs credited to the Participant's Account upon the applicable vesting date specified in the Vesting and Issuance Criteria. However, if a scheduled delivery date falls on a date that is not a trading day, such delivery date shall instead fall on the next following trading day. Notwithstanding the foregoing, in the event that the Company determines that any Shares are scheduled under this Agreement to be delivered on a day (the "Original Distribution Date") on which the Company determines that a sale by the Participant of such Shares would (i) violate the registration requirements under the Securities Act *or* (ii) violate any of the provisions of the federal securities laws (or any Company or, if applicable, Affiliate policy related thereto) *or* (iii) violate a "lock-up" agreement undertaken in connection with an issuance of securities by the Company *or* (iv) not be permitted under applicable securities laws or Company policies by the Participant on the open market *and* (v) the Company elects, prior to the Original Distribution Date, not to satisfy its tax withholding obligation by withholding Shares from the Shares otherwise due to the Participant on the Original Distribution Date under this Agreement, then such Shares shall not be delivered on such Original Distribution Date and shall instead be delivered as soon as practicable on the date on which the sale of such Shares would not be in violation of any of such registration requirements, the federal securities laws (or any Company or, if applicable, Affiliate policy related thereto), lock-up agreement or would otherwise be permitted under applicable securities laws or Company policies by the Participant on the open market; provided, however, that in no event shall the delivery of the Shares be delayed pursuant to this provision beyond the later of (a) December 31 of the calendar year in which the Original Issuance Date occurs (that is, the last day of the Participant's taxable year in which the Original Issuance Date occurs), and (b) if and only if permitted in a manner that complies with U.S. Treasury Regulation Section 1.409A-1(b)(4), the date that is the 15th day of the third calendar month of the year following the year in which the Shares under this Agreement are no longer subject to a "substantial risk of forfeiture" within the meaning of U.S. Treasury Regulation Section 1.409A-1(d).

**8.** **Form of Payment.** Payments pursuant to Section 7 shall be made in Shares (or, if settlement occurs as a result of vesting of PRSUs pursuant to a Change in Control, settlement may be made in the same consideration paid to the stockholders of the Company for Shares pursuant to the Change in Control) equal to the number of vested PRSUs credited to the Account

**9. Beneficiary.** In the event of the Participant's death prior to payment of the PRSUs credited to the Account, payment shall be made to the last beneficiary designated in writing that is received by the Company prior to the Participant's death or, if no designated beneficiary survives the Participant, such payment shall be made to the Participant's estate.

**10. Change in Control; Parachute Payments.** In the event of a Change in Control, the number of PRSUs that may vest will be determined in accordance with the Vesting and Issuance Criteria. If any payment or benefit the Participant would receive in connection with a change in control from the Company or otherwise (a "Payment") would (i) constitute a "parachute payment" within the meaning of Section 280G of the Code, and (ii) but for this sentence, be subject to the excise tax imposed by Section 4999 of the Code (the "Excise Tax"), then such Payment shall be equal to the Reduced Amount. The "Reduced Amount" shall be either (x) the largest portion of the Payment that would result in no portion of the Payment being subject to the Excise Tax or (y) the largest portion of the Payment, up to and including the total Payment, whichever amount, after taking into account all applicable federal, state and local employment taxes, income taxes, and the Excise Tax (all computed at the highest applicable marginal rate), results in the Participant's receipt, on an after-tax basis, of the greater amount of the Payment notwithstanding that all or some portion of the Payment may be subject to the Excise Tax. If a reduction in payments or benefits constituting "parachute payments" is necessary so that the Payment equals the Reduced Amount, reduction shall occur in the following order: reduction of cash payments; cancellation of accelerated vesting of stock awards; reduction of employee benefits. If acceleration of vesting of stock award compensation is to be reduced, such acceleration of vesting shall be cancelled in the reverse order of the date of grant of the Participant's stock awards. Notwithstanding the foregoing, to the extent that it is permitted under Sections 409A, 280G and 4999 of the Code, the Participant may designate a different order of reduction in payments or benefits constituting "parachute payments".

The Company shall appoint a nationally recognized independent accounting firm to make the determinations required hereunder, which accounting firm shall not then be serving as accountant or auditor for the individual, entity or group that effected the Change in Control. The Company shall bear all expenses with respect to the determinations by such accounting firm required to be made hereunder.

The accounting firm engaged to make the determinations hereunder shall provide its calculations, together with detailed supporting documentation, to the Company and the Participant within ten (10) calendar days after the date on which the Participant's right to a Payment is triggered (if requested at that time by the Company or the Participant) or such other time as requested by the Company or the Participant. If the accounting firm determines that no Excise Tax is payable with respect to a Payment, either before or after the application of the Reduced Amount, it shall furnish the Company and the Participant with an opinion reasonably acceptable to the Participant that no Excise Tax will be imposed with respect to such Payment. Any good faith determinations of the accounting firm made hereunder shall be final, binding and conclusive upon the Company and the Participant.

**11. Source of Payments.** The Participant's right to receive payment under this Agreement shall be an unfunded entitlement and shall be an unsecured claim against the general assets of the Company. The Participant has only the status of a general unsecured creditor hereunder, and this Agreement constitutes only a promise by the Company to pay the value of the Account on the payment date.

**12. Miscellaneous.**

(a) Withholding. The Participant agrees to pay to the Company, or to make satisfactory arrangement with the Company for payment of, any federal, state or local taxes, if any, required by law to be withheld in respect of the PRSUs. The Participant hereby agrees that the Company or an Affiliate, as applicable, may withhold the applicable taxes from the Participant's wages or other remuneration. At the discretion of the Company, the applicable taxes may be withheld in kind from the Shares otherwise deliverable to the Participant on the payment in settlement of the PRUs, up to the lesser of Participant's minimum required withholding rate or such other rate that will not trigger a negative accounting impact. Unless the tax withholding obligations of the Company and/or any Affiliate are satisfied, the Company shall have no obligation to deliver to the Participant any Shares. In the event the Company's obligation to withhold arises prior to the delivery to the Participant of the Shares or it is determined after the delivery of Shares to the Participant that the amount of the Company's withholding obligation was greater than the amount withheld by the Company, the Participant agrees to indemnify and hold the Company harmless from any failure by the Company to withhold the proper amount.

(b) No Rights of a Stockholder. The Participant shall not have any of the rights of a stockholder with respect to the Shares that may be issued in settlement of the PRSUs until such Shares have been issued.

(c) Nontransferability of PRSUs. Except to the extent and under such terms and conditions as determined by the Committee, the PRSUs shall not be transferable otherwise than by will or the laws of descent and distribution or as provided in Section 9.

(d) Severability. The provisions of this Agreement shall be deemed severable. If any provision of this Agreement shall be held unlawful or otherwise invalid or unenforceable in whole or in part by a court of competent jurisdiction or by reason of a change in a law or regulation, such provision shall (i) be deemed limited to the extent that such court of competent jurisdiction deems it lawful, valid and/or enforceable (or, if applicable, to the extent necessary to comply with the change in the law or regulation), and as so limited shall remain in full force and effect, and (ii) not affect any other provision of this Agreement or part thereof, each of which shall remain in full force and effect.

(e) Governing Law. This Agreement shall be governed by, and interpreted in accordance with, the laws of the State of Delaware, other than its conflict of laws principles.

(f) Headings. The headings in this Agreement are for reference purposes only and shall not affect the meaning or interpretation of this Agreement.

(g) Notices. All notices required or permitted under this Agreement shall be in writing and shall be sufficiently made or given if hand delivered or mailed by registered or certified mail, postage prepaid. Notice by mail shall be deemed delivered at the time and on the date on which the same is postmarked.

Notices to the Company should be addressed to:

Arena Pharmaceuticals, Inc.
6154 Nancy Ridge Drive
San Diego, California 92121
Attention: Chief Financial Officer

With a copy to: General Counsel

Notices to the Participant should be addressed to the Participant at the Participant's address as it appears on the Company's records. The Company or the Participant may by writing to the other party, designate a different address for notices. If the receiving party consents in advance, notice may be transmitted and received via facsimile or via such other electronic transmission mechanism as may be available to the parties. Such notices shall be deemed delivered when received.

(h) Agreement Not a Contract. This Agreement (and the grant of PRSUs) is not an employment or service contract, and nothing in this Agreement shall be deemed to create in any way whatsoever any obligation on the Participant's part to continue as an Employee, a Consultant or a Director, or of the Company or an Affiliate to continue the Participant's service as an Employee, a Consultant or a Director. The Participant's employment shall remain at-will, if applicable, and subject to termination by the Company or an Affiliate, as applicable, at any time, with or without cause or notice.

(i) Entire Agreement; Modification. Except as provided in the next sentence, this Agreement and the Plan constitute the entire agreement between the parties with respect to the subject matter contained herein and may not be modified, except as provided in the Plan or in a written document signed by each of the parties hereto, and may be rescinded only by a written agreement signed by both parties. This Agreement and Plan may be modified or superseded by the specific provisions, if any, of a written agreement, plan or other arrangement (regardless of whether entered into or established before, concurrently or after the date of this Agreement) of the Company or an Affiliate that is applicable to the Participant, to the extent such an agreement, plan or other arrangement provides a greater benefit to the Participant and otherwise does not cause the payments hereunder to fail to comply with the provisions of Section 409A of the Code.

(j) Section 409A of the Code. This Award is intended to be exempt from the application of Section 409A of the Code, including but not limited to by reason of complying with the "short-term deferral" rule set forth in Treasury Regulation Section 1.409A-1(b)(4) and will be construed and administered in such a manner and any ambiguities herein shall be interpreted accordingly. Notwithstanding the foregoing, if it is determined that the Award fails to satisfy the requirements of the short-term deferral rule and is otherwise not exempt from, and

determined to be deferred compensation subject to Section 409A of the Code, this Award shall comply with Section 409A to the extent necessary to avoid adverse personal tax consequences and any ambiguities herein shall be interpreted accordingly. Any provision of this Agreement that would cause the payment or settlement thereof to fail to satisfy Section 409A of the Code shall be amended to comply with Section 409A of the Code on a timely basis, which may be made on a retroactive basis, in accordance with regulations and other guidance issued under Section 409A of the Code. To the extent that the PRSUs are "deferred compensation" subject to the requirements of Section 409A of the Code, then notwithstanding anything contained in this Agreement to the contrary, if the Company determines that as of the date of payment the Participant is a "specified employee" (as such term is defined under Section 409A of the Code), any Shares payable by reason of the Participant's "separation from service" for purposes of Section 409A of the Code ("Separation from Service") with the Company (or an Affiliate) for any reason other than death or "disability" (as such term is defined under Section 409A of the Code), if applicable, will not be paid until the date that is six months following the date of Separation from Service (or such earlier time permitted under Section 409A of the Code without the imposition of any accelerated or additional taxes under Section 409A of the Code).

**IN WITNESS WHEREOF,** the parties have executed this Agreement effective as of the Grant Date.

**ARENA PHARMACEUTICALS, INC.**

By: _____

_____
Participant

**Attachment I**

**Award Determination, Vesting and Issuance Criteria**

The PRSUs awarded hereunder shall vest, if at all, based upon achievement of both (A) Performance Goal(s) related to Share price and (B) Participant's continued service to the Company, as described below and subject to the terms and conditions of the Plan, the Agreement and this **Attachment I**.

1. **Performance Goals and Vesting.**

(a) *Threshold Performance*. The "**Threshold Goal**" is met when both (i) during the Performance Period, the Closing Price equals or exceeds $60.00 on either (1) five consecutive trading days or (2) ten non-consecutive trading days (such full condition in (i), the "**Threshold Price**") and (ii) Participant continues in service of the Company or an Affiliate as any of an Employee, a Consultant or a Director for the Service Period. Upon achievement of the Threshold Goal, the Threshold PRSUs shall vest on the last day of the Service Period.

(b) *Target Performance*. The "**Target Goal**" is met when both (i) during the Performance Period, the Closing Price equals or exceeds $67.50 on either (1) five consecutive trading days or (2) ten non-consecutive trading days (such full condition in (i), the "**Target Price**") and (ii) Participant continues in service of the Company or an Affiliate as any of an Employee, a Consultant or a Director for the Service Period. Upon achievement of the Target Goal, the Target PRSUs shall vest on the last day of the Service Period.

(c) *Maximum Performance*. The "**Maximum Goal**" is met when both (i) during the Performance Period, the Closing Price equals or exceeds $75.00 on either (1) five consecutive trading days or (2) ten non-consecutive trading days (such full condition in (i), the "**Maximum Price**") and (ii) Participant continues in service of the Company or an Affiliate as any of an Employee, a Consultant or a Director for the Service Period. Upon achievement of the Maximum Goal, the Maximum PRSUs shall vest on the last day of the Service Period.

(d) *Maximum and Cumulative Performance Goal Achievement.* The maximum number of PRSUs that may vest under the Award is the Maximum PRSUs. PRSUs may only vest in respect of a particular Performance Goal upon the first occurrence of such Performance Goal. In the event that more than one Performance Goal is achieved during the Performance Period, the total number of PRSUs that vest under the Award shall in no event be more than the number of PRSUs corresponding to the highest Performance Goal achieved during the Performance Period. For example, if during the Performance Period the Threshold Goal is met and the Threshold PRSUs vest and subsequently the Target Goal is met, the total number of PRSUs that are vested upon achievement of the Target Goal (including the previously vested Threshold PRSUs) is the Target PRSUs (not the Target PRSUs plus the Threshold PRSUs).

(e) *Dividends*. If additional PRSUs are credited to the Participant's Account as a result of cash dividends paid on the Shares, as described in Section 3 of the Agreement, such additional PRSUs shall vest to the extent the PRSUs that resulted in the crediting of such additional PRSUs vest, if at all, in accordance with Section 3 of the Agreement and references in this Attachment I to Threshold, Target and Maximum PRSUs shall be deemed to also include any such additional PRSUs credited as dividend equivalents.

2. **Award Vesting Requirements.** Except as specifically provided below in Section 3 and 4(a), the Participant must remain in the continuous service of the Company or an Affiliate as any of an Employee, a Consultant or a Director through the end of the Service Period, including following achievement of a Threshold, Target or Maximum Price in order for a Performance Goal to be met and for any PRSUs to vest. For the avoidance of doubt, once a Threshold, Target or Maximum Price is met, the PRSUs shall vest on the last day of the Service Period (if applicable), irrespective of the trading price performance of the Shares following achievement of such Threshold, Target or Maximum Price. Shares will be issued in respect of the number of the vested PRSUs on the vesting date or such later date pursuant to Section 7 of the Agreement. Any portion of the Award that is not vested as of the earlier of (i) the end of the Performance Period, (ii) the effective time of a Change in Control (after giving effect to any vesting upon such Change in Control described in Section 3), and (iii) the Participant's Termination of Service (after giving effect to any vesting upon a Qualifying Death/Disability Termination described in Section 4(a)), will immediately terminate and be forfeited.

3. **Impact of a Change in Control**. If a Change in Control occurs during the Performance Period and prior to the Participant's Termination of Service, then the number of PRSUs that will be eligible to become vested under the Award as a result of the Change in Control, if any, shall be determined based on the Change in Control Price. If the Change in Control Price is equal to or greater than $60, $67.50 or $75, the Threshold Goal, Target Goal or Maximum Goal, respectively, shall be deemed achieved, and as of immediately prior to, but subject to the effectiveness of, such Change in Control, the applicable Threshold, Target or Maximum PRSUs will vest (provided that if the Change in Control Price falls in between any two of the $60, $67.50 or $75 prices, the number of PRSUs that vest will be determined by straight line interpolation between the Threshold PRSUs and Target PRSUs (in the case of a Change in Control Price above $60 and below $67.50) or Target PRSUs and Maximum PRSUs (in the case of a Change in Control Price above $67.50 and below $75) as applicable), in each case reduced by any PRSUs that previously vested under the Award.

> For example, if the Change in Control Price is $71.25 per share, and the Threshold Performance Goal had previously been achieved, then a number of PRSUs equal to 150% of the Target PRSUs (derived using straight line interpolation between Target PRSUs and Maximum PRSUs), reduced by the Threshold PRSUs that previously vested prior to such Change in Control, shall become vested as of immediately prior to such Change in Control.

Any PRSUs that do not become vested as of the Change in Control (after giving effect to the foregoing provisions of this Section 3) shall automatically terminate and be forfeited, without the payment of any consideration to Participant, as of the effective time of the Change in Control. The provisions of this Section 3 shall govern the terms of the Award upon a Change in Control in lieu of the provision of Section 11 of the Plan.

4. **Impact of Termination of Service**.

(a) *Death or Disability.* In the event of Participant's Qualifying Death/Disability Termination, the Participant shall vest, as of the Participant's Qualifying Death/Disability Termination, in number of PRSUs that would have vested had the Participant remained in the continuous service of the Company or an Affiliate as any of an Employee, a Consultant or a Director through the end of the Service Period, and any other PRSUs credited to the Account that do not so vest will immediately terminate and be forfeited as of such Qualifying Death/Disability Termination. In the event of Participant's Termination of Service due to death or Disability that is not a Qualifying Death/Disability Termination (including but not limited to Participant's Termination of Service due to death or Disability prior to the date a Threshold Price, Target Price or Maximum Price is met), any

portion of the Award that is not vested as of such Termination of Service will immediately terminate and be forfeited on such date.

(b) *Other Terminations*. In the event the Participant's Termination of Service for any reason other than as a result of a Qualifying Death/Disability Termination, the PRSUs credited to the Account that were not vested at the Participant's Termination of Service will immediately terminate and be forfeited as of such date.

5. **Definitions**:

(a) "**Change in Control**" has the meaning set forth in Section 11.3 of the Plan, except that: (i) Section 11.3(i) and Section 11.3(iii)(C) of the Plan shall be excluded and (ii) it shall also include the occurrence of any other event that the Board determines by an approved resolution constitutes a Change in Control.

(b) "**Change in Control Price**" means the per-Share consideration received by the Company stockholders in a Change in Control, provided that if such consideration consists in whole or in part of non-cash consideration, the Committee will determine the value of the non-cash per-Share consideration for purposes of this Award in good faith in its sole discretion.

(c) "**Closing Price**" means the closing sales price for one (1) Share as reported by the Nasdaq Stock Market (or, if the Nasdaq Stock Market is not the principal trading market for the Shares, the closing sales price reported by the principal trading market for the Shares).

(d) "**Disability**" means the Participant's becoming disabled within the meaning of Section 22(e)(3) of the Code. The Committee may require such proof of Disability as the Committee in its sole and absolute discretion deems appropriate and the Committee's determination as to whether the Participant has incurred a Disability shall be final and binding on all parties concerned.

(e) "**Maximum PRSUs**" means the number of PRSUs equal to 200% of the Target PRSUs.

(f) "**Performance Goal**" means each of the Threshold Goal, Target Goal and Maximum Goal as described in Section 1 above. In the event of any stock split, reverse stock split or other event described in Section 12.2 of the Plan that affects the Shares, each Performance Goal shall be equitably adjusted as determined appropriate by the Committee in its sole discretion.

(g) "**Performance Period**" means the period commencing on January 4, 2019 and ending on (and including) January 3, 2022.

(h) "**Qualifying Death/Disability Termination**" means a Participant's Termination of Service due to such Participant's death or Disability that occurs at a time when the Participant is an Employee and upon or after the date a Threshold Price, Target Price or Maximum Price is met but before the end of the Service Period.

(i) "**Service Period**" means the period commencing on January 4, 2019 and ending on the date that is the earlier of (i) 90 calendar days following the achievement of the Threshold Price, Target Price or Maximum Price, as applicable and (ii) immediately prior to the effective time of a Change in Control.

(j) "**Target PRSUs**" means the number of PRSUs set forth in Section 1 of the Agreement.

(k) "**Termination of Service**" means the date the Participant ceases to be in the continuous service of the Company or an Affiliate as any of an Employee, a Consultant or a Director for any reason.

(l) "**Threshold PRSUs**" means the number of PRSUs equal to 50% of the Target PRSUs.

**Exhibit 21.1**

**Subsidiaries of Arena Pharmaceuticals, Inc.**
*As of December 31, 2018*

125 Royalty Inc., a Delaware corporation

356 Royalty Inc., a Delaware corporation

Arena Pharmaceuticals Development GmbH, a limited liability company organized under the laws of Switzerland and having its domicile in Zug

Arena Pharmaceuticals GmbH, a limited liability company organized under the laws of Switzerland and having its domicile in Zofingen

Arena Pharmaceuticals Limited, a limited liability company organized under the laws of Ireland and having its domicile in Dublin

API Development LTD, a company incorporated in the Cayman Islands with limited liability

**Exhibit 23.1**

**Consent of Independent Registered Public Accounting Firm**

The Board of Directors
Arena Pharmaceuticals, Inc.:

We consent to the incorporation by reference in the registration statements (Nos. 333-135398, 333-160329, 333-182238, 333-189213, 333-212012, 333-214529, 333-217805, 333-218905 and 333-225608) on Form S-8 and (Nos. 333-112542, 333-136023, 333-160983, 333-167498, 333-212011, and 333-219237) on Form S-3 of Arena Pharmaceuticals, Inc. of our reports dated February 28, 2019, with respect to the consolidated balance sheets of Arena Pharmaceuticals, Inc. and subsidiaries as of December 31, 2018 and 2017, the related consolidated statements of operations and comprehensive loss, equity, and cash flows for each of the years in the three-year period ended December 31, 2018, and the related notes (collectively, the consolidated financial statements), and the effectiveness of internal control over financial reporting as of December 31, 2018, which reports appear in the December 31, 2018 annual report on Form 10-K of Arena Pharmaceuticals, Inc. Our report refers to the adoption of Accounting Standards Update No. 2014-09, *Revenue from Contracts with Customers (Topic 606)*, as amended.

/s/ KPMG LLP

San Diego, California
February 28, 2019

**Exhibit 31.1**

**CERTIFICATION**

I, Amit D. Munshi, certify that:

1. I have reviewed this annual report on Form 10-K of Arena Pharmaceuticals, Inc.;

2. Based on my knowledge, this annual 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 annual report;

3. Based on my knowledge, the financial statements, and other financial information included in this annual 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 annual 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 13a-15(f) and 15d-15(f)) for the registrant and have:

a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this annual 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 annual report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this annual report based on such evaluation; and

d) Disclosed in this annual 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 28, 2019

/s/ Amit D. Munshi

**Amit D. Munshi, President and Chief Executive Officer**

**(principal executive officer)**

**Exhibit 31.2**

**CERTIFICATION**

I, Kevin R. Lind, certify that:

1. I have reviewed this annual report on Form 10-K of Arena Pharmaceuticals, Inc.;

2. Based on my knowledge, this annual 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 annual report;

3. Based on my knowledge, the financial statements, and other financial information included in this annual 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 annual 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 13a-15(f) and 15d-15(f)) for the registrant and have:

a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this annual 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 annual report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this annual report based on such evaluation; and

d) Disclosed in this annual 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 28, 2019

/s/ Kevin R. Lind

**Kevin R. Lind, Executive Vice President and Chief Financial Officer**

**(principal financial and accounting officer)**

**Exhibit 32.1**

**CERTIFICATION PURSUANT TO**
**18 U.S.C. SECTION 1350,**
**AS ADOPTED PURSUANT TO**
**SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002**

In connection with the Annual Report on Form 10-K of Arena Pharmaceuticals, Inc. ("the Company") for the period ended December 31, 2018, as filed with the Securities and Exchange Commission on the date hereof (the "Report"), Amit D. Munshi, as President and Chief Executive Officer (principal and financial officer) of the Company, hereby certifies, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that to the best of his knowledge:

1. the Report fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

2. the information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

/s/ Amit D. Munshi
**Amit D. Munshi**
**President and Chief Executive Officer**
**(principal executive officer)**

Date: February 28, 2019

In connection with the Annual Report on Form 10-K of Arena Pharmaceuticals, Inc. ("the Company") for the period ended December 31, 2018, as filed with the Securities and Exchange Commission on the date hereof (the "Report"), Kevin R. Lind, as Executive Vice President and Chief Financial Officer (principal financial and accounting officer) of the Company, hereby certifies, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that to the best of his knowledge:

1. the Report fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

2. the information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

/s/ Kevin R. Lind
**Kevin R. Lind**
**Executive Vice President and Chief Financial Officer**
**(principal financial and accounting officer)**

Date: February 28, 2019