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UNITED STATES
SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM 10-K

(Mark One)

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

For the fiscal year ended December 31, 2016

OR

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

For the transition period from to

Commission File Number 001-34620

IRONWOOD PHARMACEUTICALS, INC.

(Exact name of registrant as specified in its charter)

Delaware	**04-3404176**
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification Number)
301 Binney Street **Cambridge, Massachusetts**	**02142**
(Address of Principal Executive Offices)	(Zip Code)

Registrant's telephone number, including area code: **(617) 621-7722**

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

Title of each class	**Name of each exchange on which registered**
Class A common stock, $0.001 par value	The NASDAQ Stock Market LLC (NASDAQ Global Select Market)

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

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

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or 15(d) of the Exchange 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 and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T during the preceding 12 months (or for such shorter period that the Registrant was required to submit and post such files). Yes ☒ No ☐

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K 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 or a smaller reporting company. See definitions of "large accelerated filer," "accelerated filer" and "smaller reporting company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer ☒	Accelerated filer ☐	Non-accelerated filer ☐ (Do not check if a smaller reporting company)	Smaller reporting company ☐

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

Aggregate market value of voting stock held by non-affiliates of the Registrant as of June 30, 2016: $1,818,233,767

As of February 15, 2017, there were 133,011,845 shares of Class A common stock outstanding and 14,842,077 shares of Class B common stock outstanding.

DOCUMENTS INCORPORATED BY REFERENCE:

Portions of the definitive proxy statement for our 2017 Annual Meeting of Stockholders are incorporated by reference into Part III of this report.

NOTE REGARDING FORWARD-LOOKING STATEMENTS

This Annual Report on Form 10-K, including the sections titled "Business," "Risk Factors" and "Management's Discussion and Analysis of Financial Condition and Results of Operations," contains forward-looking statements. All statements contained in this Annual Report on Form 10-K other than statements of historical fact are forward-looking statements. Forward-looking statements include statements regarding our future financial position, business strategy, budgets, projected costs, plans and objectives of management for future operations. The words "may," "continue," "estimate," "intend," "plan," "will," "believe," "project," "expect," "seek," "anticipate" and similar expressions may identify forward-looking statements, but the absence of these words does not necessarily mean that a statement is not forward-looking. These forward-looking statements include, among other things, statements about:

- the demand and market potential for our products in the countries where they are approved for marketing, as well as the revenues therefrom;
- the timing, investment and associated activities involved in commercializing LINZESS by us and Allergan plc in the U.S. and ZURAMPIC by us in the U.S.;
- the timing and execution of the launches and commercialization of CONSTELLA in the E.U. and LINZESS in Japan;
- the timing, investment and associated activities involved in developing, obtaining regulatory approval for, launching, and commercializing linaclotide by us and our partners worldwide;
- our ability and the ability of our partners to secure and maintain adequate reimbursement for our products;
- the ability of our partners and third-party manufacturers to manufacture and distribute sufficient amounts of linaclotide and lesinurad active pharmaceutical ingredient, drug product and finished goods, as applicable, on a commercial scale;
- our expectations regarding U.S. and foreign regulatory requirements for our products and our product candidates, including our post-approval development and regulatory requirements;
- the ability of our product candidates to meet existing or future regulatory standards;
- the safety profile and related adverse events of our products and our product candidates;
- the therapeutic benefits and effectiveness of our products and our product candidates and the potential indications and market opportunities therefor;
- our and our partners' ability to obtain and maintain intellectual property protection for our products and our product candidates and the strength thereof, as well as Abbreviated New Drug Applications filed by generic drug manufacturers and potential U.S. Food and Drug Administration approval thereof, and associated patent infringement suits that we have filed or may file, or other action that we may take against such companies, and the timing thereof;
- our and our partners' ability to perform our respective obligations under our collaboration, license and other agreements, and our ability to achieve milestone and other payments under such agreements;
- our plans with respect to the development, manufacture or sale of our product candidates and the associated timing thereof, including the design and results of pre-clinical and clinical studies;
- the in-licensing or acquisition of externally discovered businesses, products or technologies, including expectations relating to the completion of, or the realization of the expected benefits from, such transactions;
- our expectations as to future financial performance, revenues, expense levels, payments, cash flows,

profitability, tax obligations, capital raising and liquidity sources, and real estate needs, as well as the timing and drivers thereof;

- our ability to repay our outstanding indebtedness when due, or redeem or repurchase all or a portion of such debt, as well as the potential benefits of the note hedge transactions described herein;
- inventory levels and write downs, or asset impairments, and the drivers thereof, and inventory purchase commitments;
- our expectations regarding amortization of intangible assets;
- our ability to compete with other companies that are or may be developing or selling products that are competitive with our products and product candidates;
- the status of government regulation in the life sciences industry, particularly with respect to healthcare reform;
- trends and challenges in our potential markets;
- our ability to attract and motivate key personnel; and
- other factors discussed elsewhere in this Annual Report on Form 10-K.

Any or all of our forward-looking statements in this Annual Report on Form 10-K may turn out to be inaccurate. These forward-looking statements may be affected by inaccurate assumptions or by known or unknown risks and uncertainties, including the risks, uncertainties and assumptions identified under the heading "Risk Factors" in this Annual Report on Form 10-K. In light of these risks, uncertainties and assumptions, the forward-looking events and circumstances discussed in this Annual Report on Form 10-K may not occur as contemplated, and actual results could differ materially from those anticipated or implied by the forward-looking statements.

You should not unduly rely on these forward-looking statements, which speak only as of the date of this Annual Report on Form 10-K. Unless required by law, we undertake no obligation to publicly update or revise any forward-looking statements to reflect new information or future events or otherwise. You should, however, review the factors and risks we describe in the reports we will file from time to time with the U.S. Securities and Exchange Commission, or the SEC, after the date of this Annual Report on Form 10-K.

NOTE REGARDING TRADEMARKS

LINZESS® and CONSTELLA® are trademarks of Ironwood Pharmaceuticals, Inc. ZURAMPIC® and DUZALLO™ are trademarks of AstraZeneca AB. Any other trademarks referred to in this Annual Report on Form 10-K are the property of their respective owners. All rights reserved.

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PART I

Item 1. *Business*

Our Company

We are a commercial biotechnology company leveraging our proven development and commercial capabilities as we seek to bring multiple medicines to patients. We are advancing innovative product opportunities in areas of large unmet need, including irritable bowel syndrome with constipation, or IBS-C, and chronic idiopathic constipation, or CIC, hyperuricemia associated with uncontrolled gout, uncontrolled gastroesophageal reflux disease, or uncontrolled GERD, and vascular and fibrotic diseases.

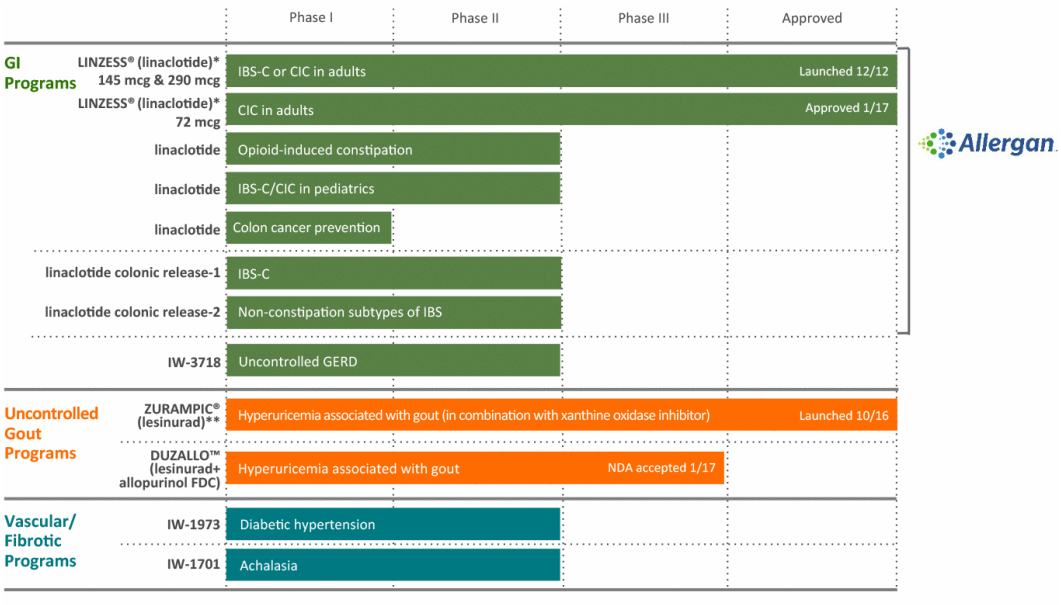
Our first commercial product, linaclotide, is available to adult men and women suffering from IBS-C or CIC in the United States, or the U.S., under the trademarked name LINZESS® and is available to adult men and women suffering from IBS-C in certain European countries under the trademarked name CONSTELLA®. We and our U.S. partner Allergan plc (together with its affiliates), or Allergan, are also advancing two linaclotide colonic release formulations. Linaclotide colonic release-1, or CR1, is a second-generation product candidate with the potential to improve abdominal pain relief in adult IBS-C patients. Linaclotide colonic release-2, or CR2, is a product candidate with the potential to improve abdominal pain relief in patients with additional gastrointestinal, or GI, disorders where lower abdominal pain is a predominant symptom such as non-constipation subtypes of IBS. Further, we and Allergan are exploring ways to enhance the clinical profile of LINZESS by studying linaclotide in additional indications and populations to assess its potential to treat various GI conditions. Linaclotide is being developed and commercialized in other parts of the world by certain of our partners.

We are advancing IW-3718, a gastric retentive formulation of a bile acid sequestrant with the potential to provide symptomatic relief in patients with uncontrolled GERD.

Our second commercial product, lesinurad, is available under the trademarked name ZURAMPIC®. In June 2016, we closed a transaction, or the Lesinurad Transaction, with AstraZeneca AB (together with its affiliates), or AstraZeneca, pursuant to which we received an exclusive license to develop, manufacture, and commercialize in the U.S. products containing lesinurad as an active ingredient, or the Lesinurad License, including ZURAMPIC and DUZALLO™. ZURAMPIC is approved for use in combination with a xanthine oxidase inhibitor, or XOI, for the treatment of hyperuricemia associated with gout in patients who have not achieved target serum uric acid, or sUA, levels with a XOI alone. We are developing DUZALLO, a fixed-dose combination product of lesinurad and allopurinol, an XOI, which is included under the Lesinurad License. In January 2017, the U.S. Food and Drug Administration, or FDA, accepted for review a new drug application, or NDA, for DUZALLO for the treatment of hyperuricemia in patients with uncontrolled gout.

We are also leveraging our pharmacological expertise in guanylate cyclase, or GC, pathways gained through the discovery and development of linaclotide to advance development programs, including IW-1973 and IW-1701, targeting soluble guanylate cyclase, or sGC. sGC is a validated mechanism with the potential for broad therapeutic utility and multiple opportunities for product development in vascular and fibrotic diseases, as well as other therapeutic areas.

Our GI, uncontrolled gout and vascular/fibrotic programs include the following:



The status of our development programs in the table above represents the ongoing phase of development, and does not correspond to the initiation or completion of a particular phase. Drug development involves a high degree of risk and investment, and the status, timing and scope of our development programs are subject to change. Important factors that could adversely affect our drug development efforts are discussed in the "Risk Factors" section of this Annual Report on Form 10-K.

LINZESS and the majority of our current product candidates have been discovered internally. We believe our discovery team has created a number of promising candidates over the past few years and has developed an extensive intellectual property estate in each of these areas. We have also accessed externally-discovered drug candidates that fit within our core strategy and intend to continue to access such drug candidates in the future. In evaluating these potential assets, we apply the same investment criteria as those used for investments in internally discovered assets. We have committed significant resources into the research and development of our product candidates and intend to continue to do so for the foreseeable future. For the years ended December 31, 2016, 2015 and 2014, research and development expenses were approximately $139.5 million, approximately $108.7 million, and approximately $101.9 million, respectively.

We were incorporated in Delaware on January 5, 1998 as Microbia, Inc. On April 7, 2008, we changed our name to Ironwood Pharmaceuticals, Inc. To date, we have dedicated a majority of our activities to the research, development and commercialization of linaclotide, commercialization of lesinurad, as well as to the research and development of our other product candidates.

GI Programs

IBS-C / CIC

IBS-C and CIC are chronic, functional GI disorders that afflict millions of sufferers worldwide. As many as 13 million adults suffer from IBS-C and as many as 35 million adults suffer from CIC in the U.S. alone, according to our analysis of studies including P Pare, et al. (published in 2001 in the *American Journal of Gastroenterology*) and J.F. Johanson, et al. (published in 2007 in *Alimentary Pharmacology and Therapeutics*) and American College of Gastroenterology Chronic Constipation Task Force (2005), American Journal of Gastroenterology Vol. 100, No. S1, 2005. Symptoms of IBS-C include abdominal pain, discomfort or bloating and constipation symptoms (e.g., incomplete

evacuation, infrequent bowel movements, hard/lumpy stools), while CIC is primarily characterized by constipation symptoms.

Linaclotide—U.S. In August 2012, the FDA approved LINZESS as a once-daily treatment for adult men and women suffering from IBS-C or CIC. We and Allergan began commercializing LINZESS in the U.S. in December 2012. Linaclotide is the first product approved by the FDA in a class of GI medicines called guanylate cyclase type-C, or GC-C, agonists. We and Allergan are also exploring development opportunities to enhance the clinical profile of LINZESS by studying linaclotide in additional indications and populations to assess its potential to treat various GI conditions.

72 mcg for CIC in Adults. In January 2017, the FDA approved a 72 mcg dose of linaclotide for the treatment of adults with CIC. Together with the currently approved 145mcg dose, the availability of the 72 mcg dose will provide physicians with dosing flexibility based on individual presentation or tolerability in treating adult CIC patients in the U.S.

Pediatrics. We and Allergan have established a nonclinical and clinical post-marketing plan with the FDA to understand the safety and efficacy of LINZESS in pediatric patients. We and Allergan have initiated two Phase II clinical pediatric studies in IBS-C patients age seven to 17 and functional constipation patients age six to 17.

Upon FDA-approval of LINZESS in the U.S., we received five years of exclusivity under the Drug Price Competition and Patent Term Restoration Act of 1984, or the Hatch-Waxman Act. In addition, LINZESS is covered by a U.S. composition of matter patent that expires in 2026, including patent term extension, as well as three additional patents covering the commercial formulation of LINZESS and methods of using this formulation to treat patients with IBS-C or CIC, all of which expire in 2031. We and Allergan have received Paragraph IV certification notice letters, or Notice Letters, regarding Abbreviated New Drug Applications, or ANDAs, submitted to the FDA by generic drug manufacturers requesting approval to engage in commercial manufacture, use, sale and offer for sale of linaclotide capsules (145 mcg and 290 mcg), proposed generic versions of LINZESS. For additional information relating to such ANDAs, see Item 3, *Legal Proceedings*, elsewhere in this Annual Report on Form 10-K.

Linaclotide—Global. Allergan has rights to develop and commercialize linaclotide in all countries worldwide other than China, Hong Kong, Macau and Japan. In November 2012, the European Commission granted marketing authorization to CONSTELLA for the symptomatic treatment of moderate to severe IBS-C in adults. CONSTELLA is the first, and to date, only drug approved in the European Union, or E.U., for IBS-C. CONSTELLA first became commercially available in certain European countries beginning in the second quarter of 2013. Allergan is commercializing CONSTELLA in a number of European countries, including the United Kingdom, Italy and Spain.

In December 2013 and February 2014, linaclotide was approved in Canada and Mexico, respectively, as a treatment for adult men and women suffering from IBS-C or CIC. Allergan has exclusive rights to commercialize linaclotide in Canada as CONSTELLA and in Mexico as LINZESS. In May 2014, CONSTELLA became commercially available in Canada and in June 2014, LINZESS became commercially available in Mexico.

Astellas Pharma Inc., or Astellas, our partner in Japan, is developing linaclotide for the treatment of patients with IBS-C and chronic constipation in its territory. In December 2016, the Japanese Ministry of Health, Labor and Welfare approved LINZESS for the treatment of adults with IBS-C in Japan. In January 2017, we and Astellas also reported positive top-line data from Astellas' Phase III clinical trial of linaclotide in adult patients with chronic constipation in Japan.

We and AstraZeneca are co-developing linaclotide in China, Hong Kong and Macau, with AstraZeneca having primary responsibility for the local operational execution. In December 2015, we and AstraZeneca filed for approval of linaclotide for adult patients with IBS-C with the China Food and Drug Administration to market linaclotide in China.

CONSTELLA is covered by European composition of matter patents, which expire in 2024. LINZESS is covered by Japanese composition of matter patents and commercial formulation patents which expire between 2024 and 2032. In addition, we have Chinese composition of matter patents and commercial formulation patents which expire between 2024 and 2032.

Linaclotide Colonic Release-1. Abdominal pain is one of the predominant symptoms associated with IBS, with greater than 75% of IBS-C patients reporting continuous or frequent abdominal pain, according to information published in 2007 by the International Foundation for Functional Gastrointestinal Disorders. In Phase III clinical trials supporting its U.S. approval, linaclotide was demonstrated to reduce the abdominal pain associated with IBS-C. We and Allergan are developing linaclotide CR1, which is a targeted oral delivery formulation of linaclotide designed to potentially improve abdominal pain relief in adult IBS-C patients.

In December 2016, we and Allergan reported positive top-line data from a Phase IIb clinical trial evaluating linaclotide CR1 in adult IBS-C patients. The data from this study demonstrate numerically greater abdominal pain improvement with linaclotide CR1 300 mcg compared to placebo and to the 290 mcg immediate release formulation of linaclotide. We believe the data support advancement into a Phase III clinical trial in adult IBS-C patients.

Uncontrolled GERD

IW-3718. According to a study published in 2010 by H. El-Sarag in *Alimentary Pharmacology & Therapeutics* and 2015 U.S. census data, there are an estimated 10 million Americans who suffer regularly from symptoms of GERD, such as heartburn and regurgitation, despite receiving the current standard of care of treatment with a proton pump inhibitor to suppress stomach acid. Research suggests some uncontrolled GERD patients may experience reflux of bile from the intestine into the stomach and esophagus.

We are investigating IW-3718, a gastric retentive formulation of a bile acid sequestrant designed to bind over an extended period of time to bile that refluxes into the stomach and upper small intestine, potentially providing symptomatic relief in patients with uncontrolled GERD. In March 2016, we initiated a Phase IIb clinical study of IW-3718 in patients with uncontrolled GERD.

Other GI Disorders

Linaclotide Colonic Release-2. Our second linaclotide colonic release formulation, linaclotide CR2, is being developed for use in GI disorders without constipation, but where lower abdominal pain is a predominant symptom. In December 2016, we and Allergan reported top-line data from a Phase IIb clinical trial evaluating linaclotide CR2 in IBS-C patients. The data from this study demonstrate numerically improved abdominal pain and other abdominal symptoms relative to placebo, as intended, with no apparent effect on bowel movement function. We believe the data support further investigation of linaclotide CR2 in additional GI indications associated with abdominal pain, including non-constipation subtypes of IBS.

Linaclotide. We and Allergan are evaluating linaclotide as a potential treatment of the GI dysfunction associated with opioid induced constipation, or OIC. In November 2015, we reported positive top-line data from a Phase II clinical study evaluating linaclotide in adult patients with OIC in which linaclotide-treated patients showed a statistically significant improvement in bowel movement frequency compared to placebo-treated patients. In addition, the National Cancer Institute, or NCI, completed a Phase I biomarker study with linaclotide in partnership with us and Allergan, designed to assess the colorectal bioactivity of linaclotide in healthy volunteers and to inform the feasibility and design of a study to evaluate the potential for linaclotide to prevent colorectal cancer. The NCI funded and managed the clinical study.

IW-9179. In April 2016, we discontinued development of IW-9179 for gastroparesis, as top-line data from our exploratory Phase IIa clinical study indicated that IW-9179 did not meaningfully reduce the severity of symptoms in patients with diabetic gastroparesis. In July 2016, we also discontinued advancing IW-9179 for the treatment of functional dyspepsia and are no longer advancing the program.

Uncontrolled Gout Programs

Gout is a highly symptomatic and painful form of inflammatory arthritis affecting more than nine million people in the U.S., according to a study published in 2011 by Y. Zhu in Arthritis & Rheumatology and an estimated 3% compound annual growth rate in gout incidence based on data reported in this same study and in a study published in 2002 by E. Arromdee in *The Journal of Rheumatology*. It is caused by an underlying metabolic disorder, hyperuricemia, high levels of uric acid in the blood, and can lead to painful flares characterized by excruciating pain, inflammation, swelling and tenderness in one or more joints. More than four million patients are treated with an XOI, either allopurinol

or febuxostat, for gout in the U.S. Of these, an estimated two million patients are uncontrolled and are not achieving target sUA levels (<6 mg/dL as recommended by the American College of Rheumatology), despite treatment with an XOI according to Zhu Y, et al. Prevalence of Gout and Hyperuricemia in the US General Population. Arthritis Rheum. 2011;63:3136-41. These patients continue to suffer from flares, and may face serious long-term consequences that can result from having uncontrolled sUA levels.

Lesinurad. In June 2016, we closed a transaction with AstraZeneca pursuant to which we received an exclusive license to develop, manufacture, and commercialize in the U.S. products containing lesinurad as an active ingredient, including ZURAMPIC. Lesinurad 200mg tablets were approved as ZURAMPIC by the FDA in December 2015, for use in combination with an XOI for the treatment of hyperuricemia associated with uncontrolled gout. In October 2016, ZURAMPIC became commercially available in the U.S.

Fixed-Dose Combination Product. We are also developing DUZALLO, a fixed-dose combination product of lesinurad and allopurinol, an XOI, which is included under the Lesinurad License. In January 2017, the FDA accepted for review the NDA for DUZALLO for the treatment of hyperuricemia in patients with uncontrolled gout.

Vascular/Fibrotic Programs

We are advancing development programs targeting sGC, and exploring their utility in vascular and fibrotic diseases. The stimulation of sGC is a clinically validated approach with broad therapeutic potential. Found throughout the body, sGC is an enzyme that is activated by the key regulator nitric oxide to increase levels of the second messenger cyclic guanosine monophosphate, or cGMP, which ultimately regulates processes such as blood flow, inflammation and fibrosis. As modulators of these core physiological processes, sGC stimulators may be relevant in the treatment of a broad range of diseases. To date, we have identified multiple sGC development candidates, including IW-1973 and IW-1701 in clinical development, which have distinct pharmacologic profiles that we believe may be differentiating and enable opportunities in multiple indications.

IW-1973. Our lead sGC candidate, IW-1973, is targeting diabetic complications resulting from vascular dysfunction and fibrosis, such as resistant hypertension and diabetic nephropathy. In November 2016, we initiated a Phase IIa open-label, placebo-controlled clinical study of IW-1973 in patients with Type 2 diabetes and hypertension. The Phase IIa study is designed to evaluate the tolerability, pharmacokinetic and pharmacodynamic effects of IW-1973 across multiple doses, as well as to explore its effect on biomarkers.

IW-1701. In November 2016, we initiated a Phase IIa randomized, double-blind, placebo-controlled, single-dose clinical study of IW-1701 designed to evaluate the safety, tolerability, pharmacokinetics and pharmacodynamics of IW-1701 in patients with Type II achalasia.

Collaborations and Partnerships

As part of our strategy, we have established development and commercial capabilities that we plan to leverage as we seek to bring multiple medicines to patients. We intend to play an active role in the development and commercialization of our products in the U.S., and to establish a strong global brand by out-licensing commercialization rights to our internally developed products in other territories to high-performing partners. We believe in the long-term value of our drug candidates, so we seek collaborations that provide meaningful economics and incentives for us and any potential partner. Furthermore, we seek partners who share our values, culture, processes and vision for our products, which we believe will enable us to work with those partners successfully for the entire potential patent life of our drugs. We intend to continue to access innovative externally developed products through strategic transactions and to leverage our existing capabilities to develop and commercialize these products in the U.S.

The following chart shows our revenue for the U.S. and territories outside of the U.S. as a percentage of our total revenue for each of the years ended December 31, 2016, 2015 and 2014. Revenue attributable to our linaclotide partnerships comprised substantially all of our revenue for each of the years indicated. Further, we currently derive substantially all of our revenue from our LINZESS collaboration with Allergan for the U.S. and believe that the revenues from this collaboration will continue to constitute a significant portion of our total revenue for the foreseeable future. In addition, our collaborative arrangements revenue outside of the U.S. has fluctuated for the years ended December 31, 2016, 2015 and 2014, and may continue to fluctuate as a result of the timing and amount of license fees and clinical and commercial milestones received and recognized under our current and future strategic partnerships outside of the U.S.,

as well as the timing and amount of royalties from the sales of linaclotide in the markets in which it is currently approved, or any other markets where linaclotide receives approval.

	Year Ended December 31,		
	2016	2015	2014
U.S.	83.1 %	92.3 %	62.3 %
Rest of world	16.9 %	7.7 %	37.7 %
	100.0 %	100.0 %	100.0 %

Linaclotide

We have pursued a partnering strategy for commercializing linaclotide that has enabled us to retain significant oversight over linaclotide's development and commercialization worldwide, share the costs with collaborators whose capabilities complement ours, and retain a significant portion of linaclotide's future long-term value. As of December 31, 2016, licensing fees, milestones, royalties and related equity investments from our linaclotide partners cumulatively totaled approximately $409.6 million. In addition, we and Allergan jointly fund the development and commercialization of LINZESS in the U.S., sharing equally in any net profits or losses, and we and AstraZeneca jointly fund the development and commercialization of linaclotide in China, Hong Kong and Macau, with AstraZeneca receiving 55% of the net profits or incurring 55% of the net losses until a certain specified commercial milestone is achieved, at which time profits or losses will be shared equally thereafter. Such reimbursements for our development and commercialization costs received from Allergan in the U.S. or AstraZeneca are excluded from the amount above.

Allergan plc. In September 2007, we entered into a collaboration agreement with Allergan to develop and commercialize linaclotide for the treatment of IBS-C, CIC and other GI conditions in North America. Under the terms of the collaboration agreement, we and Allergan are jointly and equally funding the development and commercialization of LINZESS in the U.S., with equal share of any profits or losses. Additionally, we granted Allergan exclusive rights to develop and commercialize linaclotide in Canada and Mexico in which we receive royalties in the mid-teens percent on net sales in those countries. Allergan is solely responsible for the further development, regulatory approval and commercialization of linaclotide in those countries and funding any costs. Total licensing, milestone payments and related equity investments to us under the Allergan collaboration agreement for North America could total up to $330.0 million, including the $205.0 million that Allergan has already paid to us in license fees and development-related milestones and the $25.0 million of our capital stock that Allergan has already purchased.

In April 2009, we entered into a license agreement with Almirall, or the European License Agreement, to develop and commercialize linaclotide in Europe (including the Commonwealth of Independent States and Turkey) for the treatment of IBS-C, CIC and other GI conditions. Under the terms of this agreement, we were eligible to receive licensing, milestone payments and related equity investments that could have totaled up to $118.0 million, including the $61.0 million in milestones, net of foreign withholding taxes, that Almirall previously paid to us, and the $15.0 million of our capital stock that Almirall previously purchased. We were also eligible to receive royalties based on sales volume in the Almirall territory, reduced by the transfer price paid for the active pharmaceutical ingredient, or API included in the product actually sold in the Almirall territory and other contractual deductions. In October 2015, Almirall transferred its exclusive license to develop and commercialize linaclotide in Europe to Allergan, and we separately entered into an amendment to the license agreement with Allergan relating to the development and commercialization of linaclotide in Europe. Pursuant to the terms of the amendment, (i) the remaining sales-based milestones payable to us under the license agreement were modified such that, when aggregated with the remaining commercial launch milestones, they could total up to $42.5 million, (ii) the royalties payable to us during the term of the license agreement were modified such that the royalties based on sales volume in Europe begin in the mid-single digit percent and escalate to the upper-teens percent by calendar year 2019, and (iii) Allergan assumed responsibility for the manufacturing of linaclotide API for Europe from us, as well as the associated costs. Furthermore, as we are no longer responsible for the manufacturing of linaclotide API for Europe, the royalties under the license agreement are no longer reduced by the transfer price paid for the API included in the product actually sold by Allergan in Europe in any given period.

In January 2017, we and Allergan entered into an amendment to the European License Agreement pursuant to which the license granted to Allergan was extended to a territory consisting of all countries worldwide not previously covered by the European License Agreement, other than China, Hong Kong, Macau, Japan, and the countries and territories of North America. On a country-by-country and product-by-product basis in such additional territory, Allergan will pay us an annual royalty as a percentage of net sales of products containing linaclotide as an active

ingredient in the upper-single digits for five years following the first commercial sale of a linaclotide product in a country, and in the low-double digits thereafter. The royalty rate for products in expanded territory will decrease, on a country-by-country basis, to the lower-single digits, or cease entirely, following the occurrence of certain events. Allergan will also assume certain purchase commitments for quantities of linaclotide API under our agreements with third-party API suppliers.

Astellas Pharma Inc. In November 2009, we entered into a license agreement with Astellas, as amended, to develop and commercialize linaclotide for the treatment of IBS-C, CIC and other GI conditions in Japan. Astellas has paid us all licensing and milestone payments under the license agreement totaling $75.0 million. These payments consisted of a $30.0 million up-front licensing fee and $45.0 million in development milestones. Astellas will pay us gross royalties which escalate based on sales volume in the Astellas territory, beginning in the low-twenties percent, less the transfer price paid for the API included in the product actually sold in Japan and other contractual deductions.

AstraZeneca AB. In October 2012, we entered into a collaboration with AstraZeneca to co-develop and co-commercialize linaclotide in China, Hong Kong and Macau. Under the terms of the agreement, we and AstraZeneca are jointly funding the development and commercialization of linaclotide in the AstraZeneca territory, with AstraZeneca receiving 55% of the net profits or incurring 55% of the net losses until a certain specified commercial milestone is achieved, at which time profits or losses will be shared equally thereafter. If linaclotide is successfully developed and commercialized in the AstraZeneca territory, total licensing and milestone payments to us under the collaboration agreement could total up to $150.0 million, including the $25.0 million that AstraZeneca has already paid to us. As part of the collaboration, Ironwood's sales force promoted AstraZeneca's NEXIUM® (esomeprazole magnesium), one of AstraZeneca's products, in the U.S. through May 2014.

Lesinurad

In June 2016, we closed the Lesinurad Transaction. Under the terms of the Lesinurad License, we made an up-front payment to AstraZeneca of $100.0 million. We will also pay AstraZeneca tiered single-digit royalties on product sales as well as sales-related and other milestones of up to $165.0 million. We and AstraZeneca also entered into a commercial supply agreement, or the Lesinurad CSA, pursuant to which we rely exclusively on AstraZeneca for the commercial manufacture and supply of ZURAMPIC, and if approved, DUZALLO. We and AstraZeneca also entered into a transitional services agreement, or the Lesinurad TSA, where AstraZeneca will, among other things, provide certain product support services to us.

Co-Promotion and Other Commercial Agreements

Exact Sciences Corp. In March 2015, we and Exact Sciences Corp, or Exact Sciences, entered into an agreement to co-promote Exact Sciences' Cologuard®, the first and only FDA-approved noninvasive stool DNA screening test for colorectal cancer, or the Exact Sciences Co-Promotion Agreement. The Exact Sciences Co-Promotion Agreement was terminated by the parties in August 2016. Under the terms of this agreement, our sales team promoted and educated health care practitioners regarding Cologuard through July 2016, with LINZESS remaining as our first-position product. Exact Sciences maintained responsibility for all other aspects of the commercialization of Cologuard outside of the co-promotion. Under the terms of the Exact Sciences Co-Promotion Agreement, we are compensated primarily via royalties earned on the net sales of Cologuard generated from the healthcare practitioners on whom we called with such royalties being payable through July 2017.

Allergan plc. In August 2015, we and Allergan entered into an agreement for the co-promotion of VIBERZI™ (eluxadoline) in the U.S., Allergan's treatment for adults suffering from IBS with diarrhea, or IBS-D. Under the terms of the agreement, our clinical sales specialists are detailing VIBERZI to the approximately 25,000 health care practitioners to whom they detail LINZESS. Allergan is responsible for all costs and activities relating to the commercialization of VIBERZI outside of the co-promotion. Our promotional efforts are compensated based on the volume of calls delivered by our sales force, with the terms of the agreement reducing or eliminating certain of the unfavorable adjustments to our share of net profits stipulated by the linaclotide collaboration agreement with Allergan for North America, provided that we deliver a minimum number of VIBERZI calls on physicians. We have the potential to achieve milestone payments of up to $10.0 million based on the net sales of VIBERZI in each of 2017 and 2018, and are also compensated via reimbursements for medical education initiatives. Our promotional efforts under the agreement began when VIBERZI became commercially available in December 2015, and will continue until December 31, 2017, unless earlier terminated by either party pursuant to the provisions of the agreement.

In January 2017, we and Allergan entered into a commercial agreement under which the adjustments to our or Allergan's share of the net profits under the share adjustment provision of the collaboration agreement for linaclotide in North America are eliminated, in full, in 2018 and all subsequent years. In addition, Allergan appointed us, on a non-exclusive basis, to promote CANASA®, approved for the treatment of ulcerative proctitis, and DELZICOL®, approved for the treatment of ulcerative colitis, in the U.S. for approximately two years. We will perform certain third position details and offer samples of such products to gastroenterology prescribers who are on the then-current call panel for LINZESS to which we provide first or second position details, and we will purchase samples of CANASA and DELZICOL from Allergan at the actual manufacturing cost. On a product-by-product basis, Allergan will pay us a royalty in the mid-teens on incremental sales of CANASA and DELZICOL above a mutually agreed upon sales baseline. We expect to commence these promotion activities on or about February 27, 2017 and, subject to our or Allergan's rights of early termination, the commercial agreement will expire on February 26, 2019. The share adjustment relief will, in the case of Allergan's termination for convenience and certain other specified circumstances, survive termination of the commercial agreement.

Owner-related Business Principles

We encourage all current and potential stockholders to read the owner-related business principles below that guide our overall strategy and decision making.

1. Ironwood's stockholders own the business; all of our employees work for them.

Each of our employees also has equity in the business, aligning their interests with those of their fellow stockholders. As employees and co-owners of Ironwood, our management and employee team seek to effectively allocate scarce stockholder capital to maximize the average annual growth of per share value.

Through our policies and communication, we seek to attract like-minded owner-oriented stockholders. We strive to effectively communicate our views of the business opportunities and risks over time so that entering and exiting stockholders are doing so at a price that approximately reflects our intrinsic value.

2. We believe we can best maximize long-term stockholder value by building a great pharmaceutical franchise.

We believe that Ironwood has the potential to deliver outstanding long-term returns to stockholders who are sober to the risks inherent in the pharmaceutical product lifecycle and to the potential dramatic highs and lows along the way, and who focus on superior long-term, per share cash flows.

Since the pharmaceutical product lifecycle is lengthy and unpredictable, we believe it is critical to have a long-term strategic horizon. We work hard to embed our long-term focus into our policies and practices, which may give us a competitive advantage in attracting like-minded stockholders and the highest caliber employees. Our current and future employees may perceive both financial and qualitative advantages in having their inventions or hard work result in marketed drugs that they and their fellow stockholders continue to own. Some of our key policies and practices that are aligned with this imperative include:

a. Our dual class equity voting structure (which provides for super-voting rights of our pre-IPO stockholders only in the event of a change of control vote) is designed to concentrate change of control decisions in the hands of long-term focused owners who have a history of experience with us.

b. We grant each of our employees stock-based awards, and long-term equity is a significant component of their total compensation. We believe our emphasis on equity plays an important role in attracting and motivating the owner-oriented employees we seek and aligning their interests with those of their fellow stockholders.

c. We have adopted a change of control severance plan for all of our employees that is intended to encourage them to bring forward their best ideas by providing them with the comfort that if a change of control occurs and their employment is terminated, they will still have an opportunity to share in the economic value that they have helped create for stockholders.

d. All of the members of our board of directors are investors in the company. Furthermore, each director is required to hold all shares of stock acquired as payment for his or her service as a director throughout his or her term on the board.

e. Our linaclotide partnerships with Allergan, Astellas and AstraZeneca all include standstill agreements, which serve to protect us from an unwelcome acquisition attempt by one of our partners. In addition, we have change of control provisions in our linaclotide partnership agreements in order to protect the economic value of linaclotide should the acquirer of one of our partners be unable or unwilling to devote the time and resources required to maximize linaclotide's benefit to patients in their respective territory.

3. We are and will remain careful stewards of our stockholders' capital.

We work intensely to allocate capital carefully and prudently, continually reinforcing a lean, cost-conscious culture.

While we are mindful of the declining productivity and inherent challenges of pharmaceutical research and development, we intend to invest in discovery and development research for many years to come. Our singular passion is to create, develop and commercialize novel drug candidates, seeking to integrate the most successful drugmaking and marketing practices of the past and the best of today's cutting-edge technologies and basic research, development and commercialization advances.

While we hope to improve the productivity and efficiency of our drug creation efforts over time, our discovery process revolves around small, highly interactive, cross-functional teams. We believe that this is one area where our relatively small size is a competitive advantage, so for the foreseeable future, we do not expect our drug discovery team to grow beyond 100-150 scientists. We will continue to prioritize constrained resources and maintain organizational discipline. Once internally or externally derived candidates advance into development, compounds follow careful stage-gated plans, with further advancement depending on clear data points. Since most pharmaceutical research and development projects fail, it is critical that our teams are rigorous in making early go/no go decisions, following the data, terminating unsuccessful programs, and allocating scarce dollars and talent to the most promising efforts, thus enhancing the likelihood of late phase development success.

We work with our partners to establish redundancy at each critical node of the supply chain in the U.S. for lesinurad and globally for linaclotide. This mitigates against a fundamental risk inherent with pharmaceuticals—unanticipated shortages of commercial product. Likewise, we have established a commercial organization dedicated to bringing innovative, highly-valued healthcare solutions to all of our customers. Our commercial organization, working closely and methodically with our global commercialization partners, strives to maximize our products' commercial potential through focused efforts aimed at educating patients, payers and healthcare providers.

4. Our financial goal is to maximize long-term per share cash flows.

Our goal is to maximize long-term cash flows per share, and we will prioritize this even if it leads to uneven short-term financial results. If and when we become profitable, we expect and accept uneven earnings growth. Our underlying product development model is risky and unpredictable, and we have no intention to advance marginal development candidates or consummate suboptimal in-license transactions in an attempt to fill anticipated gaps in revenue growth. Successful drugs can be enormously beneficial to patients and highly profitable and rewarding to stockholders, and we believe strongly in our ability to occasionally (but not in regular or predictable fashion) create and commercialize great medicines that make a meaningful difference in patients' lives.

If and when we reach profitability, we do not intend to issue quarterly or annual earnings guidance; however we plan to continue to be transparent about the key elements of our performance, including near-term operating plans and longer-term strategic goals.

Our Strategy

Our mission is to create medicines that make a difference for patients, build value for our fellow stockholders, and empower our passionate team. Our core strategy to achieve this mission is to leverage our development and commercial capabilities to bring multiple medicines to patients. Key elements of our strategy include:

- attracting and incentivizing a team with a singular passion for creating, developing and commercializing medicines that can make a significant difference in patients' lives;
- successfully and profitably commercializing LINZESS in collaboration with Allergan in the U.S.;
- exploring development opportunities to enhance the clinical profile of LINZESS by studying linaclotide in additional indications, populations and formulations to assess its potential to treat various GI conditions;
- successfully and profitably commercializing ZURAMPIC and, if approved, DUZALLO in the U.S.;
- investing in our pipeline of novel GI product candidates, DUZALLO for uncontrolled gout, and our sGC stimulators targeting vascular/fibrotic diseases;
- solidifying and expanding our position as the leader in the field of GC-C agonists and cGMP pharmacology;
- leveraging our U.S.-focused commercial capabilities in marketing, reimbursement, patient engagement and sales;
- evaluating external candidates for in-licensing or acquisition opportunities;
- maximizing the commercial potential of our drugs and playing an active role in their commercialization or finding partners who share our vision, values, culture and processes;
- supporting global partners to develop and commercialize linaclotide outside of the U.S.; and,
- executing our strategy with our stockholders' long-term interests in mind by seeking to maximize long-term per share cash flows.

Competition

Linaclotide

Linaclotide competes globally with certain prescription therapies and over-the-counter, or OTC, products for the treatment of IBS-C and CIC, or their associated symptoms.

OTC and generic laxatives make up the majority of the IBS-C and CIC treatment market, according to a GI patient landscape survey performed in 2010 by Lieberman *et al*. Polyethylene glycol (such as MiraLAX®), and lactulose account for the majority of prescription laxative treatments, according to 2015 data from QuintilesIMS National Prescription Audit and IRi OTC. Given the low barriers to access, many IBS-C and CIC sufferers try OTC fiber and laxatives, but according to this same patient landscape survey, less than half of them are very satisfied with the ability of these OTC products to manage their symptoms. Two of the highest selling OTC laxatives in the U.S., based on 2013 U.S. sales volume data from Euromonitor International, are MiraLAX and Dulcolax®.

Until the launch of LINZESS, the only available branded prescription therapy for IBS-C and CIC in the U.S. was AMITIZA® (lubiprostone), which was approved for the treatment of CIC in 2006, for the treatment of IBS-C in 2008, and for the treatment of opioid-induced constipation in 2013. AMITIZA is being commercialized in the U.S. by Takeda Pharmaceuticals Limited. Synergy Pharmaceuticals, Inc., or Synergy, obtained approval of TRULANCE™ (plecanatide) in the U.S. for the treatment of CIC in January 2017. Synergy is also developing plecanatide for the treatment of IBS-C. Currently, there are additional compounds in late-stage development by other companies for the

treatment of U.S. patients with IBS-C and CIC. AMITIZA is being commercialized for the treatment of adults with CIC in certain European countries, including the United Kingdom and Switzerland by Sucampo AG, and for the treatment of chronic constipation in Japan by Mylan N.V.

Lesinurad

More than four million patients are treated with an XOI, either allopurinol or febuxostat, for gout in the U.S. according to Zhu Y, *et al*. Prevalence of Gout and Hyperuricemia in the US General Population. Arthritis Rheum. 2011;63:3136-41, with the majority of patients taking allopurinol. For patients who are still not achieving target sUA levels on allopurinol alone, physicians typically prescribe an escalated dose of allopurinol or introduce ULORIC® (febuxostat), another XOI, into their treatment regimen. ULORIC was approved for the chronic management of hyperuricemia in patients with gout in 2009 and is being commercialized in the U.S. by Takeda Pharmaceuticals Americas, Inc.

Manufacturing and Supply

We currently manage our global supply and distribution of linaclotide and lesinurad through a combination of contract manufacturers and collaboration partners. It is our objective to produce safe and effective medicine on a worldwide basis, with redundancy built into critical steps of the supply chain. We believe that we have sufficient in-house expertise to manage our manufacturing and supply chain network to meet worldwide demand.

Linaclotide

Linaclotide production consists of three phases—manufacture of the API (sometimes referred to as drug substance), manufacture of drug product and manufacture of finished goods. We and certain of our partners have entered into commercial supply agreements with multiple third party manufacturers for the production of linaclotide API. We believe our commercial suppliers have the capabilities to produce linaclotide API in accordance with current good manufacturing practices, or GMP, on a sufficient scale to meet our development and commercial needs. Our commercial suppliers are subject to routine inspections by regulatory agencies worldwide and also undergo periodic audit and certification by our quality department.

Each of Allergan and Astellas is responsible for drug product and finished goods manufacturing (including bottling and packaging) for its respective territories, and distributing the finished goods to wholesalers. We have an agreement with an independent third party to serve as an additional source of drug product manufacturing of linaclotide for our partnered territories and we have worked with our partners to achieve sufficient redundancy in this component of the linaclotide supply chain. Under our collaboration with AstraZeneca, we are accountable for drug product and finished goods manufacturing for China, Hong Kong and Macau.

Prior to linaclotide, there was no precedent for long-term room temperature shelf storage formulation for an orally dosed peptide to be produced in millions of capsules per year. Our efforts to date have led to a formulation that is both cost effective and able to meet the stability requirements for commercial pharmaceutical products. Our work in this area has created an opportunity to seek additional intellectual property protection around the linaclotide program. In conjunction with Allergan and Astellas, we have filed patent applications in the U.S. and foreign jurisdictions and have been issued three U.S. patents to protect the current commercial formulation of linaclotide as well as related formulations. The three issued U.S. patents expire in 2031. If issued, the pending patent applications would expire in 2029 or later in the U.S. and foreign jurisdictions and would be eligible for potential patent term adjustments or patent term extensions in countries where such extensions may be available.

Lesinurad

Lesinurad production consists of three phases—manufacture of the API (sometimes referred to as drug substance), manufacture of drug product and manufacture of finished goods. We have a Lesinurad CSA with AstraZeneca to manufacture finished goods containing lesinurad for the U.S., including ZURAMPIC and DUZALLO. We also have the Lesinurad TSA under which AstraZeneca provides certain services related to the supply of lesinurad including distribution services. We are currently building distribution capabilities for lesinurad in advance of the transfer of such activities to us. We believe our commercial supplier has the capabilities to produce lesinurad in accordance with

current GMP, on a sufficient scale to meet our needs. Our commercial supplier is subject to routine inspections by regulatory agencies worldwide and also under goes periodic audit and certification by our quality department.

Sales and Marketing

For the foreseeable future, we intend to develop and commercialize our drugs in the U.S. alone or with partners, and expect to rely on partners to commercialize our drugs in territories outside the U.S. In executing our strategy, our goal is to retain significant worldwide oversight over the development process and commercialization of our products, by playing an active role in their commercialization or finding partners who share our vision, values, culture and processes.

We built our commercial capabilities, including marketing, reimbursement, patient engagement and sales, with the intent to leverage these capabilities for future internally and externally developed products. To date, we have established a high-quality commercial organization dedicated to bringing innovative, highly-valued healthcare solutions to our customers, including patients, payers, and healthcare providers.

We are also coordinating efforts with our linaclotide partners to ensure that we launch and maintain an integrated, global linaclotide brand. By leveraging the knowledge base and expertise of our experienced commercial team and the insights of each of our linaclotide commercialization partners, we continually improve our collective marketing strategies.

Patents and Proprietary Rights

We actively seek to protect the proprietary technology that we consider important to our business, including pursuing patents that cover our products and compositions, their methods of use and the processes for their manufacture, as well as any other relevant inventions and improvements that are commercially important to the development of our business. We also rely on trade secrets that may be important to the development of our business.

Our success will depend significantly on our ability to obtain and maintain patent and other proprietary protection for the technology, inventions and improvements we consider important to our business; defend our patents; preserve the confidentiality of our trade secrets; and operate without infringing the patents and proprietary rights of third parties.

Linaclotide Patent Portfolio

Our linaclotide patent portfolio is currently composed of nine U.S. patents listed in the FDA publication, "Approved Drug Products with Therapeutic Equivalence Evaluations", or the Orange Book, three granted European patents (each of which has been validated in 31 European countries), six granted Japanese patents, five granted Chinese patents, 32 issued patents in other foreign jurisdictions, and numerous pending provisional, U.S. non-provisional, foreign and PCT patent applications. We own or jointly own all of the issued patents and pending applications.

The issued U.S. patents, which will expire between 2024 and 2031, contain claims directed to the linaclotide molecule, pharmaceutical compositions thereof, methods of using linaclotide to treat GI disorders, processes for making the molecule, and room temperature stable formulations of linaclotide and methods of use thereof. The granted European patents, which will expire in 2024, subject to potential patent term extension, contain claims directed to the linaclotide molecule, pharmaceutical compositions thereof and uses of linaclotide to prepare medicaments for treating GI disorders. The granted Chinese patents, which will expire between 2024 and 2032, the granted Japanese patents, which will expire between 2024 and 2032 (subject to potential patent term extension), and the granted patents in other foreign jurisdictions, which will expire between 2024 and 2031 (some of which may be subject to potential patent term extension), contain claims directed to the linaclotide molecule, pharmaceutical compositions of linaclotide for use in treating GI disorders, and room temperature stable formulations of linaclotide.

We have pending patent applications in certain countries worldwide that, if issued, will expire between 2024 and 2032 and which include claims covering the linaclotide molecule, methods of using linaclotide to treat GI disorders, and the current commercial formulation of linaclotide.

We have pending applications directed to linaclotide products, including our CR formulations, under development that will extend patent protection, if issued, until 2035 or later. We also have pending provisional, U.S. non-provisional, foreign and PCT applications directed to linaclotide and related molecules, pharmaceutical formulations thereof, methods of using linaclotide to treat various diseases and disorders and processes for making the molecule. These additional patent applications, if issued, will expire between 2024 and 2036.

The patent term of a patent that covers an FDA-approved drug is also eligible for patent term extension, which permits patent term restoration as compensation for some of the patent term lost during the FDA regulatory review process. The Hatch-Waxman Act permits a patent term extension of a single patent applicable to an approved drug for up to five years beyond the expiration of the patent but the extension cannot extend the remaining term of a patent beyond a total of 14 years from the date of product approval by the FDA. The United States Patent and Trademark Office, or USPTO, has issued a Certificate of Patent Term Extension for U.S. Patent 7,304,036, which covers linaclotide and methods of use thereof. As a result, the patent term of this patent was extended to August 30, 2026, 14 years from the date of linaclotide's approval by the FDA. Similar provisions are available in Europe and certain other foreign jurisdictions to extend the term of a patent that covers an approved drug.

Lesinurad Patent Portfolio

Our lesinurad patent portfolio is currently composed of seven U.S. patents listed in the Orange Book and several pending provisional and U.S. non provisional patent applications. We have exclusively licensed these issued patents and pending applications from AstraZeneca for development and commercialization of products containing lesinurad in the U.S.

The issued U.S. patents, which will expire between 2025 and 2032, contain claims directed to the lesinurad molecule, pharmaceutical compositions thereof, formulations comprising lesinurad and an additional agent effective for treating gout, methods of using lesinurad to treat gout and related disorders, and processes for making solid forms of lesinurad. We also have licensed pending U.S. non-provisional applications directed to lesinurad and related molecules, pharmaceutical compositions thereof, methods of using lesinurad to treat gout and related disorders, and processes for making the molecule. These additional patent applications, if issued, will expire between 2025 and 2037.

The patent term of a patent that covers an FDA-approved drug is also eligible for patent term extension. Patent term extension applications have been filed with the USPTO on five of the issued patents covering lesinurad. If one of the patent term extension applications is approved by the USPTO, the patent term of one lesinurad patent would be extended to between April 22, 2028 and December 22, 2029, 14 years from the date of lesinurad's approval by the FDA.

Pipeline Patent Portfolio

Our pipeline patent portfolio relating to our development programs outside of linaclotide and lesinurad is currently composed of four issued U.S. patents; nine issued patents in foreign jurisdictions, including a European patent that has been validated in six European countries; and numerous pending provisional, U.S. non-provisional, foreign and Patent Cooperation Treaty, or PCT, patent applications. We own all of the issued patents and pending applications. The issued U.S. patents expire between 2028 and 2034. The foreign issued patents expire between 2027 and 2032. The pending patent applications, if issued, will expire between 2027 and 2037.

Additional Intellectual Property

In addition to the patents and patent applications related to linaclotide, lesinurad and our pipeline, we currently have nine issued U.S. patents; 16 patents granted in foreign jurisdictions, including European and Eurasian patents that have each been validated in several countries; and a number of pending provisional, U.S. non-provisional, foreign and PCT applications directed to other GC-C agonist molecules and uses thereof. We also have other issued patents and pending patent applications relating to our other research and development programs, and we are the licensee of a number of issued patents and pending patent applications.

The term of individual patents depends upon the legal term of the patents in the countries in which they are obtained. In most countries in which we file, the patent term is 20 years from the date of filing the non-provisional application. In the U.S., a patent's term may be lengthened by patent term adjustment, which compensates a patentee for administrative delays by the U.S. Patent and Trademark Office in granting a patent, or may be shortened if a patent is

terminally disclaimed over an earlier-filed patent. We also expect to apply for patent term extensions for some of our patents once issued, depending upon the length of clinical trials and other factors involved in the submission of a NDA.

Government Regulation

In the U.S., pharmaceutical products are subject to extensive regulation by the FDA. The Federal Food, Drug, and Cosmetic Act and other federal and state statutes and regulations, govern, among other things, the research, development, testing, manufacture, storage, recordkeeping, approval, labeling, promotion and marketing, distribution, FDA post-marketing requirements and assessments, post-approval monitoring and reporting, sampling, and import and export of pharmaceutical products. The FDA has very broad enforcement authority and failure to abide by applicable regulatory requirements can result in administrative or judicial sanctions being imposed on us, including warning letters, refusals of government contracts, clinical holds, civil penalties, injunctions, restitution, disgorgement of profits, recall or seizure of products, total or partial suspension of production or distribution, withdrawal of approval, refusal to approve pending applications, and civil or criminal prosecution.

FDA Approval Process

We believe that our product candidates will be regulated by the FDA as drugs. No company may market a new drug until it has submitted an NDA to the FDA, and the FDA has approved it. The steps required before the FDA may approve an NDA generally include:

- conducting nonclinical laboratory tests and animal tests in compliance with FDA's good laboratory practice requirements;
- development, manufacture and testing of active pharmaceutical product and dosage forms suitable for human use in compliance with current GMP;
- conducting adequate and well-controlled human clinical trials that establish the safety and efficacy of the product for its specific intended use(s);
- In order to evaluate a drug in humans in the U.S., an investigational new drug application, or IND, must be submitted and come into effect before human clinical trials may begin.
- the submission to the FDA of an NDA;
- satisfactory completion of one or more FDA inspections of the manufacturing facility or facilities at which the product, or components thereof, are produced to assess compliance with current GMP requirements and to assure that the facilities, methods and controls are adequate to preserve the product's identity, strength, quality and purity; and
- Inspections of other sources of data in the NDA, such as inspection of clinical trial sites to assess compliance with good clinical practice, or GCP, requirements are also generally required.
- FDA review and approval of the NDA.

Nonclinical tests include laboratory evaluation of the product candidate, as well as animal studies to assess the potential safety and efficacy of the product candidate. The conduct of the nonclinical tests must comply with federal regulations and requirements including good laboratory practices. We must submit the results of the nonclinical tests, together with manufacturing information, analytical data and a proposed clinical trial protocol to the FDA as part of an IND, which must become effective before we may commence human clinical trials in the U.S. The IND will automatically become effective 30 days after its receipt by the FDA, unless the FDA raises concerns or questions before that time about the conduct of the proposed trial. In such a case, we must work with the FDA to resolve any outstanding concerns before the clinical trial can proceed. We cannot be sure that submission of an IND will result in the FDA allowing clinical trials to begin, or that, once begun, issues will not arise that will cause us or the FDA to modify, suspend or terminate such trials. The study protocol and informed consent information for patients in clinical trials must also be submitted to an institutional review board for approval. An institutional review board may also require the

clinical trial at the site to be halted, either temporarily or permanently, for failure to comply with the institutional review board's requirements or if the trial has been associated with unexpected serious harm to subjects. An institutional review board may also impose other conditions on the trial.

Clinical trials involve the administration of the product candidate to humans under the supervision of qualified investigators, generally physicians not employed by or under the trial sponsor's control. Clinical trials are typically conducted in three sequential phases, though the phases may overlap or be combined. In Phase I, the initial introduction of the drug into healthy human subjects, the drug is usually tested for safety (adverse effects), dosage tolerance and pharmacologic action, as well as to understand how the drug is taken up by and distributed within the body. Phase II usually involves studies in a limited patient population (individuals with the disease under study) to:

- evaluate preliminarily the efficacy of the drug for specific, targeted conditions;
- determine dosage tolerance and appropriate dosage as well as other important information about how to design larger Phase III trials; and
- identify possible adverse effects and safety risks.

Phase III trials generally further evaluate clinical efficacy and test for safety within an expanded patient population. The conduct of clinical trials is subject to extensive regulation, including compliance with GCP regulations and guidance, and regulations designed to protect the rights and safety of subjects involved in investigations.

The FDA may order the temporary or permanent discontinuation of a clinical trial at any time or impose other sanctions if it believes that the clinical trial is not being conducted in accordance with FDA requirements or presents an unacceptable risk to the clinical trial patients. We may also suspend clinical trials at any time on various grounds.

The results of the nonclinical and clinical studies, together with other detailed information, including the manufacture and composition of the product candidate, are submitted to the FDA in the form of an NDA requesting approval to market the drug. The FDA approval of the NDA is required before marketing of the product may begin in the U.S. If the NDA contains all pertinent information and data, the FDA will "file" the application and begin review. The review process, however, may be extended by FDA requests for additional information, nonclinical or clinical studies, clarification regarding information already provided in the submission, or submission of a risk evaluation and mitigation strategy. The FDA may refer an 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 recommendations of an advisory committee, but it considers such recommendations carefully when making decisions. Before approving an NDA, the FDA will typically inspect the facilities at which the product candidate is manufactured and will not approve the product candidate unless current GMP compliance is satisfactory. The FDA also typically inspects facilities responsible for performing animal testing, as well as clinical investigators who participate in clinical trials. The FDA may refuse to approve an NDA if applicable regulatory criteria are not satisfied, or may require additional testing or information. The FDA may also limit the indications for use and/or require post-marketing testing and surveillance to monitor the safety or efficacy of a product. Once granted, product approvals may be withdrawn if compliance with regulatory standards is not maintained or problems are identified following initial marketing.

The testing and approval process requires substantial time, effort and financial resources, and our product candidates may not be approved on a timely basis, if at all. The time and expense required to perform the clinical testing necessary to obtain FDA approval for regulated products can frequently exceed the time and expense of the research and development initially required to create the product. The results of nonclinical studies and initial clinical trials of our product candidates are not necessarily predictive of the results from large-scale clinical trials, and clinical trials may be subject to additional costs, delays or modifications due to a number of factors, including difficulty in obtaining enough patients, investigators or product candidate supply. Failure by us or our collaborators, licensors or licensees, including Allergan, Astellas and AstraZeneca, to obtain, or any delay in obtaining, regulatory approvals or in complying with requirements could adversely affect commercialization and our ability to receive product or royalty revenues.

Hatch-Waxman Act

The Hatch-Waxman Act established abbreviated approval procedures for generic drugs. Approval to market and distribute these drugs is obtained by submitting an ANDA with the FDA. The application for a generic drug is

"abbreviated" because it need not include nonclinical or clinical data to demonstrate safety and effectiveness and may instead rely on the FDA's previous finding that the brand drug, or reference drug, is safe and effective. In order to obtain approval of an ANDA, an applicant must, among other things, establish that its product is bioequivalent to an existing approved drug and that it has the same active ingredient(s), strength, dosage form, and the same route of administration. A generic drug is considered bioequivalent to its reference drug if testing demonstrates that the rate and extent of absorption of the generic drug is not significantly different from the rate and extent of absorption of the reference drug when administered under similar experimental conditions.

The Hatch-Waxman Act also provides incentives by awarding, in certain circumstances, certain legal protections from generic competition. This protection comes in the form of a non-patent exclusivity period, during which the FDA may not accept, or approve, an application for a generic drug, whether the application for such drug is submitted through an ANDA or a through another form of application, known as a 505(b)(2) application.

The Hatch-Waxman Act grants five years of exclusivity when a company develops and gains NDA approval of a new chemical entity that has not been previously approved by the FDA. This exclusivity provides that the FDA may not accept an ANDA or 505(b)(2) application for five years after the date of approval of previously approved drug, or four years in the case of an ANDA or 505(b)(2) application that challenges a patent claiming the reference drug (see discussion below regarding Paragraph IV Certifications). The Hatch-Waxman Act also provides three years of exclusivity for approved applications for drugs that are not new chemical entities, if the application contains the results of new clinical investigations (other than bioavailability studies) that were essential to approval of the application. Examples of such applications include applications for new indications, dosage forms (including new drug delivery systems), strengths, or conditions of use for an already approved product. This three-year exclusivity period only protects against FDA approval of ANDAs and 505(b)(2) applications for generic drugs that include the innovation that required new clinical investigations that were essential to approval; it does not prohibit the FDA from accepting or approving ANDAs or 505(b)(2) NDAs for generic drugs that do not include such an innovation.

Paragraph IV Certifications. Under the Hatch-Waxman Act, NDA applicants and NDA holders must provide information about certain patents claiming their drugs for listing in the Orange Book. When an ANDA or 505(b)(2) application is submitted, it must contain one of several possible certifications regarding each of the patents listed in the Orange Book for the reference drug. A certification that a listed patent is invalid, unenforceable or will not be infringed by the sale of the proposed product is called a "Paragraph IV" certification.

Within 20 days of the acceptance by the FDA of an ANDA or 505(b)(2) application containing a Paragraph IV certification, the applicant must notify the NDA holder and patent owner that the application has been submitted, and provide the factual and legal basis for the applicant's opinion that the patent is invalid or not infringed. The NDA holder or patent holder may then initiate a patent infringement suit in response to the Paragraph IV notice. If this is done within 45 days of receiving notice of the Paragraph IV certification, a 30-month stay of the FDA's ability to approve the ANDA or 505(b)(2) application is triggered. The FDA may approve the proposed product before the expiration of the 30-month stay only if a court finds the patent invalid or not infringed, and the court may shorten or lengthen the 30-month stay under certain limited circumstances.

Patent Term Restoration. Under the Hatch-Waxman Act, a portion of the patent term lost during product development and FDA review of an NDA or 505(b)(2) application is restored if approval of the application is the first permitted commercial marketing of a drug containing the active ingredient. The patent term restoration period is generally one-half the time between the effective date of the IND and the date of submission of the NDA, plus the time between the date of submission of the NDA and the date of FDA approval of the product. The maximum period of patent term extension is five years, and the patent cannot be extended to more than 14 years from the date of FDA approval of the product. Only one patent claiming each approved product is eligible for restoration and the patent holder must apply for restoration within 60 days of approval. The U.S. Patent and Trademark Office, in consultation with the FDA, reviews and approves the application for patent term restoration.

Other Regulatory Requirements

After approval, drug products are subject to extensive continuing regulation by the FDA, which include company obligations to manufacture products in accordance with current GMP, maintain and provide to the FDA updated safety and efficacy information, report adverse experiences with the product, keep certain records and submit periodic reports, obtain FDA approval of certain manufacturing or labeling changes, and comply with FDA promotion

and advertising requirements and restrictions. Failure to meet these obligations can result in various adverse consequences, both voluntary and FDA-imposed, including product recalls, withdrawal of approval, restrictions on marketing, and the imposition of civil fines and criminal penalties against the NDA holder. In addition, later discovery of previously unknown safety or efficacy issues may result in restrictions on the product, manufacturer or NDA holder.

We and any manufacturers of our products are required to comply with applicable FDA manufacturing requirements contained in the FDA's current GMP regulations. Current GMP regulations require, among other things, quality control and quality assurance as well as the corresponding maintenance of records and documentation. The manufacturing facilities for our products must meet current GMP requirements to the satisfaction of the FDA pursuant to a pre-approval inspection before we can use them to manufacture our products. We and any third-party manufacturers are also subject to periodic inspections of facilities by the FDA and other authorities, including procedures and operations used in the testing and manufacture of our products to assess our compliance with applicable regulations.

With respect to post-market product advertising and promotion, the FDA imposes a number of complex regulations on entities that advertise and promote pharmaceuticals, which include, among others, standards for direct-to-consumer advertising, prohibitions on promoting drugs for uses, conditions or diseases, or in patient populations that are not described in the drug's approved labeling (known as "off-label use"), and principles governing industry-sponsored scientific and educational activities. Failure to comply with FDA requirements can have negative consequences, including adverse publicity, warning or untitled letters from the FDA, mandated corrective advertising or communications with doctors or patients, and civil or criminal penalties. Although physicians may prescribe legally available drugs for off-label uses, manufacturers may not market or promote such off-label uses.

Changes to some of the conditions established in an approved application, including changes in indications, labeling, or manufacturing processes or facilities, require submission and FDA approval of a new NDA or NDA supplement before the change can be implemented. An NDA supplement for a new indication typically requires clinical data similar in type and quality to the clinical data supporting the original application for the original indication, and the FDA uses similar procedures and actions in reviewing such NDA supplements as it does in reviewing NDAs.

Adverse event reporting and submission of periodic reports is required following FDA approval of an NDA. The FDA also may require post-marketing testing, known as Phase IV testing, risk evaluation and mitigation strategies, and surveillance to monitor the effects of an approved product or to place conditions on an approval that restrict the distribution or use of the product.

Outside the U.S., our and our collaborators' abilities to market a product are contingent upon receiving marketing authorization from the appropriate regulatory authorities. The requirements governing marketing authorization, pricing and reimbursement vary widely from jurisdiction to jurisdiction. At present, foreign marketing authorizations are applied for at a national level, although within the E.U. registration procedures are available to companies wishing to market a product in more than one E.U. member state.

Sales and Marketing

The marketing and sale of pharmaceutical products are subject to comprehensive governmental regulation both within and outside the U.S.

Within the U.S., numerous federal, state and local authorities have jurisdiction over, or enforce laws related to, such activities, including the FDA, U.S. Drug Enforcement Agency, Centers for Medicare and Medicaid Services, the U.S. Department of Health and Human Services Office of Inspector General, the U.S. Department of Justice, state Attorneys General, state departments of health and state pharmacy boards.

We are subject to the requirements of the FDC Act and accompanying regulations that prohibit pharmaceutical companies from promoting a drug prior to approval from the FDA and from promoting an approved drug in a manner inconsistent with the approved label.

We are also subject to various federal and state laws pertaining to health care "fraud and abuse," including anti-kickback laws and false claims laws, for activities related to sales of any of our products or product candidates that may in the future receive marketing approval. Anti-kickback laws generally prohibit persons from soliciting, receiving or providing remuneration, directly or indirectly, to induce either the referral of an individual, for an item or service or the

purchasing or ordering of a good or service, for which payment may be made under federal healthcare programs such as Medicare and Medicaid. Although the specific provisions of these laws vary, their scope is generally broad and there may not be regulations, guidance or court decisions that apply the laws to particular industry practices. False claims laws prohibit, among other things, individuals or entities from knowingly presenting, or causing to be presented, information or claims for payment from Medicare, Medicaid, or other third-party payers that are false or fraudulent. Violations of fraud and abuse laws may be punishable by criminal or civil sanctions, including fines and civil monetary penalties, and/or exclusion from federal health care programs (including Medicare and Medicaid).

Laws and regulations have been enacted by the federal government and various states to regulate the sales and marketing practices of pharmaceutical manufacturers with marketed products. The laws and regulations generally limit financial interactions between manufacturers and health care providers and/or require disclosure to the government and public of such interactions. Many of these laws and regulations contain ambiguous requirements or require administrative guidance for implementation.

Employees

As of December 31, 2016, we had 674 employees. Approximately 42 were scientists engaged in discovery research, 147 were in our drug development organization, 386 were in our sales and commercial team, and 99 were in general and administrative functions. None of our employees are represented by a labor union, and we consider our employee relations to be good.

Executive Officers of the Registrant

The following table sets forth the name, age and position of each of our executive officers as of February 15, 2017:

Name	Age	Position
Peter M. Hecht, Ph.D.	53	Chief Executive Officer, Director
Tom Graney	52	Chief Financial Officer and Senior Vice President, Finance and Corporate Strategy
Mark G. Currie, Ph.D.	62	Senior Vice President, Chief Scientific Officer and President of R&D
Halley E. Gilbert	47	Senior Vice President, Chief Legal Officer, and Secretary
Thomas A. McCourt	59	Senior Vice President, Marketing and Sales and Chief Commercial Officer

Peter M. Hecht has served as our chief executive officer and a director since our founding in 1998. Under his leadership, Ironwood has grown from nine Ph.D. scientists to a commercial biotechnology company. Prior to founding Ironwood, Dr. Hecht was a research fellow at Whitehead Institute for Biomedical Research. Dr. Hecht earned a B.S. in mathematics and an M.S. in biology from Stanford University, and holds a Ph.D. in molecular biology from the University of California at Berkeley.

Tom Graney has served as our chief financial officer and senior vice president of finance and corporate strategy since joining us in August 2014. Prior to joining our company, Mr. Graney held a number of positions in the areas of mergers and acquisitions, strategic marketing, finance and accounting at Johnson & Johnson, or J&J, and its affiliates since 1994. Most recently Mr. Graney served as worldwide vice president of finance and chief financial officer of Ethicon, a global leader in surgical medical devices, from January 2010 to August 2014. Prior to that, Mr. Graney was vice president of finance for J&J Global Supply Chain from August 2009 to January 2010, chief financial officer of J&J's Janssen Pharmaceuticals from February 2008 to August 2009, and chief financial officer for J&J Global Virology (including Tibotec Pharmaceuticals) from November 2005 to February 2008. A chartered financial analyst charterholder, Mr. Graney serves on the board of directors of AC Immune SA, a clinical stage Swiss-based biopharmaceutical company focused on neurodegenerative diseases, and holds a Bachelor of Science degree in accounting from the University of Delaware and an M.B.A. in marketing, finance and international business from the Leonard N. Stern School of Business at New York University.

Mark G. Currie serves as our senior vice president, chief scientific officer and president of research and development, and has led our research and development efforts since joining us in 2002. Prior to joining Ironwood, Dr. Currie directed cardiovascular and central nervous system disease research as vice president of discovery research at Sepracor Inc. Previously, Dr. Currie initiated, built and led discovery pharmacology and also served as director of

arthritis and inflammation at Monsanto Company. Dr. Currie earned a B.S. in biology from the University of South Alabama and holds a Ph.D. in cell biology from the Bowman-Gray School of Medicine of Wake Forest University.

Halley E. Gilbert joined Ironwood in 2008 as the founding member of our legal department, providing leadership and oversight and establishing our company's compliance function as Ironwood grew from a privately-held, research-based organization to a publicly-traded, fully-integrated commercial biotechnology company. Ms. Gilbert brings significant strategic leadership and two decades of experience navigating biopharmaceutical companies through transformational change, as well as expertise in corporate transactions, corporate governance, employment law and legal and operational issues relevant to launching new medicines into specialty and primary care markets. Prior to joining Ironwood, Ms. Gilbert was Vice President, Deputy General Counsel at Cubist Pharmaceuticals, Inc. from 2002 to 2008, where she supported the launch of Cubist's first acute care antibiotic, and she served as Corporate Counsel at Genzyme Corp. from 1999 to 2001. Ms. Gilbert began her career at Skadden, Arps, Slate, Meagher & Flom LLP, where she specialized in mergers and acquisitions and securities law. She serves on the board of directors of Achaogen, Inc., a clinical-stage biopharmaceutical company focused on the development of novel antibacterials, and holds a J.D. from Northwestern University School of Law and a B.A. from Tufts University.

Thomas A. McCourt has served as our senior vice president of marketing and sales and chief commercial officer since joining Ironwood in 2009. Prior to joining Ironwood, Mr. McCourt led the U.S. brand team for denosumab at Amgen Inc. from April 2008 to August 2009. Prior to that, Mr. McCourt was with Novartis AG from 2001 to 2008, where he directed the launch and growth of Zelnorm for the treatment of patients with IBS-C and CIC and held a number of senior commercial roles, including vice president of strategic marketing and operations. Mr. McCourt was also part of the founding team at Astra Merck Inc., leading the development of the medical affairs and science liaison group and then serving as brand manager for Prilosec™ and NEXIUM®. Mr. McCourt serves on the board of directors of Acceleron Pharma Inc. and has a degree in pharmacy from the University of Wisconsin.

Available Information

You may obtain free copies of our Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q and Current Reports on Form 8-K, and amendments to those reports, as soon as reasonably practicable after they are electronically filed or furnished to the SEC, on the Investors section of our website at www.ironwoodpharma.com or by contacting our Investor Relations department at (617) 374-5082. The contents of our website are not incorporated by reference into this report and you should not consider information provided on our website to be part of this report.

Item 1A. ***Risk Factors***

In addition to the other information in this Annual Report on Form 10-K, any of the factors described below could significantly and negatively affect our business, financial condition, results of operations or prospects. The trading price of our Class A common stock may decline due to these risks.

Risks Related to Our Business and Industry

We are highly dependent on the commercial success of LINZESS in the U.S. for the foreseeable future and we are also dependent on the commercial success of ZURAMPIC; we cannot guarantee when, or if, we will attain profitability or positive cash flows.

We and our partner, Allergan plc (together with its affiliates), or Allergan, began selling LINZESS in the U.S. during December 2012. In June 2016, we licensed exclusive rights to commercialize ZURAMPIC and other products containing lesinurad in the U.S. and we began selling ZURAMPIC in October 2016. While we believe that the revenues from our LINZESS collaboration will continue to constitute a significant portion of our total revenue for the foreseeable future, revenue from sales of ZURAMPIC is also important to our financial success. The commercial success of LINZESS and ZURAMPIC depend on a number of factors, including:

- the effectiveness of LINZESS as a treatment for adult patients with irritable bowel syndrome with constipation, or IBS-C, or chronic idiopathic constipation, or CIC, and the effectiveness of ZURAMPIC as a treatment for patients with hyperuricemia associated with uncontrolled gout;
- the size of the treatable patient populations;

- the effectiveness of the sales, managed markets and marketing efforts for LINZESS by us and Allergan and for ZURAMPIC by us;
- the adoption of LINZESS and ZURAMPIC by physicians, which depends on whether physicians view such products as safe and effective treatments for their approved patient populations and indications;
- our success in educating and activating potential patients to enable them to more effectively communicate their symptoms and treatment history to their physicians;
- our ability to both secure and maintain adequate reimbursement for, and optimize patient access to, LINZESS and ZURAMPIC by providing third party payers with a strong value proposition based on the existing burden of illness associated with IBS-C and CIC or hyperuricemia associated with uncontrolled gout, respectively, and the benefits of these products;
- the effectiveness of Allergan's distribution networks for LINZESS and the effectiveness of the distribution strategy and networks for ZURAMPIC;
- the occurrence of any side effects, adverse reactions or misuse, or any unfavorable publicity in these areas, associated with LINZESS or ZURAMPIC; and
- the development or commercialization of competing products or therapies for the treatment of IBS-C or CIC, or their associated symptoms, for LINZESS or for the treatment of hyperuricemia associated with uncontrolled gout, or its associated symptoms, for ZURAMPIC.

Our revenues from the commercialization of LINZESS and ZURAMPIC are subject to these factors, and therefore may be unpredictable from quarter-to-quarter. Ultimately, we may never generate sufficient revenues from LINZESS and ZURAMPIC to reach or maintain profitability for our company or to sustain our anticipated levels of operations.

Linaclotide and lesinurad may cause undesirable side effects or have other properties that could limit their commercial potential.

The most commonly reported adverse reaction since linaclotide became commercially available, as well as in the clinical trials for linaclotide in IBS-C and CIC, has been diarrhea. In the linaclotide Phase III IBS-C and CIC trials, severe diarrhea was reported in 2% or less of the linaclotide-treated patients and its incidence was similar between the IBS-C and CIC populations. Linaclotide has been prescribed to approximately one and a half million patients since its launch in the U.S. and other territories beginning in December 2012, and, as a result, it has been used in wider populations and in less rigorously controlled environments than in the clinical studies supporting its approval.

The most commonly reported adverse reactions in the clinical trials for ZURAMPIC (in combination with a xanthine oxidase inhibitor, or XOI) for the treatment of hyperuricemia associated with uncontrolled gout were headache, influenza, increased blood creatinine and gastroesophageal reflux disease. ZURAMPIC was launched in October 2016, and, as a result, it is being used in wider populations and in less rigorously controlled environments than in the clinical studies supporting its approval. Additionally, because ZURAMPIC is approved for use in combination with an XOI for the treatment of hyperuricemia associated with uncontrolled gout, our patients may experience side effects and adverse reactions associated with the use of such XOIs. Notwithstanding its U.S. Food and Drug Administration, or FDA, -approved label, if ZURAMPIC is taken without an XOI, patients may experience new or increased risk of adverse reactions, including the heightened risk of acute renal failure.

Further, as we, our partners and, in the case of lesinurad, AstraZeneca's other licensees, conduct clinical trials, including in new or existing territories, indications, populations or formulations, as well as explore potential combination products, the number of patients treated with our products within and outside of such products' currently approved indications and patient populations has grown and continues to do so.

As patient experience expands, we and others may identify previously unknown side effects, known side effects may be found to be more frequent or severe than in the past, and we and others may detect unexpected safety signals for

our products or any products perceived to be similar to our products. The foregoing, or the perception of the foregoing, may have the following effects:

- sales of our products may be impaired;
- regulatory approvals for our products may be denied, restricted or withdrawn;
- we or our partners may decide to, or be required to, change the products' label or send product warning letters or field alerts to physicians, pharmacists and hospitals;
- reformulation of the products, additional nonclinical or clinical studies, changes in labeling or changes to or reapprovals of manufacturing facilities may be required;
- we or our partners may be precluded from pursuing approval of linaclotide in new territories or from studying additional development opportunities to enhance our products' clinical profiles, including within new or existing indications, populations and formulations, as well as in potential combination products;
- our or our products' reputation in the marketplace may suffer; and
- government investigations or lawsuits, including class action suits, may be brought against us or our partners.

Any of the above occurrences would harm or prevent sales of our products, increase expenses and impair our and our partners' ability to successfully commercialize linaclotide or our ability to successfully commercialize lesinurad.

In addition, both LINZESS and ZURAMPIC contain a boxed warning about their use. The FDA-approved label for LINZESS contains a boxed warning about its use in pediatric patients. LINZESS is contraindicated in pediatric patients up to 6 years of age based on nonclinical data from studies in neonatal mice approximately equivalent to human pediatric patients less than 2 years of age. There is also a warning advising physicians to avoid the use of LINZESS in pediatric patients 6 through 17 years of age. This warning is based on data in young juvenile mice and the lack of clinical safety and efficacy data in pediatric patients of any age group. We and Allergan have established a nonclinical and clinical post-marketing plan with the FDA to understand the safety and efficacy of LINZESS in pediatric patients, which is discussed below.

The FDA-approved label for ZURAMPIC contains a boxed warning about the risk of acute renal failure with ZURAMPIC, which is more common when ZURAMPIC is used without an XOI. ZURAMPIC is contraindicated in patients with severe renal impairment or end-stage renal diseases, kidney transplant recipients, patients on dialysis or patients with tumor lysis syndrome or Lesch-Nyhan syndrome. The FDA has required that a post-marketing clinical study be conducted to further evaluate the renal and cardiovascular safety of ZURAMPIC, which AstraZeneca is conducting on our behalf, and which is discussed below.

We rely entirely on contract manufacturers and our partners to manufacture and distribute linaclotide and lesinurad. If they are unable to comply with applicable regulatory requirements, unable to source sufficient raw materials, experience manufacturing or distribution difficulties, or are otherwise unable to manufacture and distribute sufficient quantities to meet demand, our commercialization efforts may be materially harmed.

We have no internal manufacturing or distribution capabilities. Instead, we rely on a combination of contract manufacturers and our partners to manufacture active pharmaceutical ingredient, or API, and final drug product, and to distribute that drug product to third party purchasers. With respect to linaclotide, we and certain of our partners have commercial supply agreements with independent third parties to manufacture the linaclotide API used to support all of our partnered and unpartnered territories. Each of Allergan and Astellas is responsible for linaclotide drug product and finished goods manufacturing (including bottling and packaging) for its respective territories, and distributing the finished goods to wholesalers. Among our linaclotide drug product manufacturers, only Allergan has significant experience in manufacturing linaclotide on a commercial scale. We have an agreement with an independent third party to serve as an additional source of drug product manufacturing of linaclotide for our partnered territories and we have worked with our partners to achieve sufficient redundancy in this component of the linaclotide supply chain. Under our collaboration with AstraZeneca for linaclotide, we are accountable for drug product and finished goods manufacturing for China, Hong Kong and Macau.

With respect to lesinurad, we have a commercial supply agreement with AstraZeneca to manufacture finished drug product and a transitional services agreement with AstraZeneca for certain services, such as distribution. We rely exclusively on AstraZeneca as our supplier of finished drug product for ZURAMPIC. If, for any reason, AstraZeneca is unable or unwilling to perform under our commercial supply agreement or if AstraZeneca performs poorly, our ability to timely deliver ZURAMPIC to our customers would be significantly impaired or we might not be able to supply ZURAMPIC to our customers at all. The sales of ZURAMPIC would be adversely affected and such failure to deliver finished drug product to our customers would negatively impact our reputation. If such event occurs, we would need to identify alternate manufacturers and we would expend time and effort to validate and obtain necessary regulatory approvals for such alternative manufacturers and there is no assurance that we would be able to identify alternative manufacturers that would be available to us on acceptable terms, if at all.

Each of our API and drug product manufacturers must comply with current good manufacturing practices, or GMP, and other stringent regulatory requirements enforced by the FDA and foreign regulatory authorities in other jurisdictions. These requirements include, among other things, quality control, quality assurance and the maintenance of records and documentation, which occur in addition to our own quality assurance releases. Manufacturers of our products may be unable to comply with these GMP requirements and with other regulatory requirements. We have little control over our manufacturers' or partners' compliance with these regulations and standards.

Our manufacturers may experience problems with their respective manufacturing and distribution operations and processes, including for example, quality issues, such as product specification and stability failures, procedural deviations, improper equipment installation or operation, utility failures, contamination and natural disasters. In addition, the raw materials necessary to make API for our products are acquired from a limited number of sources. Any delay or disruption in the availability of these raw materials or a change in raw material suppliers could result in production disruptions, delays or higher costs with consequent adverse effects on us.

The manufacture of pharmaceutical products requires significant expertise and capital investment, including the development of advanced manufacturing techniques and process controls. Manufacturers of pharmaceutical products often encounter difficulties in commercial production. These problems include difficulties with production costs and yields, quality control, including stability of the product and quality assurance testing, and shortages of qualified personnel, as well as compliance with federal, state and foreign regulations and the challenges associated with complex supply chain management. Even if our manufacturers or partners do not experience problems and commercial manufacturing is achieved, their maximum or available manufacturing capacities may be insufficient to meet commercial demand. Finding alternative manufacturers or adding additional manufacturers requires a significant amount of time and involves significant expense. New manufacturers would need to develop and implement the necessary production techniques and processes, which along with their facilities, would need to be inspected and approved by the regulatory authorities in each applicable territory.

If our API or drug product manufacturers fail to adhere to applicable GMP or other regulatory requirements, experience delays or disruptions in the availability of raw materials or experience manufacturing or distribution problems, we will suffer significant consequences, including product seizures or recalls, loss of product approval, fines and sanctions, reputational damage, shipment delays, inventory shortages, inventory write-offs and other product-related charges and increased manufacturing costs. If we experience any of these results, or if our manufacturers' maximum or available capacities are insufficient to meet demand, we may not be able to successfully commercialize our products.

Expanding and maintaining our commercial infrastructure for ZURAMPIC and lesinurad is a significant undertaking that requires substantial financial and managerial resources, and we may encounter delays or may not be successful in our efforts.

While we are currently marketing and selling LINZESS in the U.S. with our partner Allergan, ZURAMPIC is our first solely marketed product in the U.S. and we have limited experience in acquiring and integrating additional products into our current commercial infrastructure. Unlike LINZESS, we are solely responsible for the commercialization of ZURAMPIC and we do not have significant experience with all components of a commercial launch of this size without a partner. Establishing, maintaining and/or expanding the necessary capabilities are competitive and time-consuming and the commercialization of ZURAMPIC requires a significant expenditure of operating, financial and management resources. Even with those investments, we may not be able to maximize our sales of ZURAMPIC or we may incur more expenditures than anticipated in order to maximize our sales. We cannot

guarantee that we will be able to establish, maintain and/or expand our sales, marketing, distribution and market access capabilities, and enter into and maintain any agreements necessary for commercialization with payers and third-party providers on acceptable terms, if at all. If we are unable to establish, maintain and/or expand such capabilities, either on our own or by entering into agreements with others, or are unable to do so in an efficient manner or on a timely basis, we will not be able to maximize our sales of ZURAMPIC, which would adversely affect our business, operating results and financial condition.

We also have no prior experience as a company developing or commercializing products in the field of uncontrolled gout. While we have significant experience, and have been successful, in marketing LINZESS to primary care physicians and other prescribers, our competitors in the field of uncontrolled gout have more experience marketing products in this indication and may more successfully market their products. Our competitors may also develop, manufacture and market products to treat hyperuricemia associated with uncontrolled gout that are more effective or less expensive than ours, or that have a better safety profile.

We will incur additional expenses to successfully integrate ZURAMPIC and, if developed, other lesinurad products with our business operations and such integration has been, and will be, a complex and time-consuming process. We refer to ZURAMPIC and other potential lesinurad products as the Lesinurad Business. There may be substantial difficulties, costs and delays relating to establishing and maintaining certain capabilities necessary to commercialize ZURAMPIC and transitioning certain activities from AstraZeneca. Such integration may result in the distraction of management and key functional areas from day-to-day operations and the diversion of financial resources that would otherwise be available for the ongoing development or commercialization of our other programs.

Even if the commercialization of ZURAMPIC and the integration of the Lesinurad Business are successful, we may fail to further our business strategy as anticipated or to achieve anticipated benefits and success. We have made assumptions relating to the impact of the Lesinurad Business on our financial results relating to numerous matters, including the amount of goodwill and intangible assets related to the Lesinurad Business, the cost of development and commercialization of ZURAMPIC and other potential lesinurad products, the likelihood of approval of DUZALLO, the fixed dose combination product containing lesinurad and allopurinol, and the other financial and strategic risks related to the acquisition of the Lesinurad Business. We may incur higher than expected operating, transaction and integration costs, and we may encounter general economic and business conditions that adversely affect the Lesinurad Business. If one or more of these assumptions are incorrect, it could have an adverse effect on our business and operating results, and the benefits from the acquisition of the Lesinurad Business may not be realized or be of the magnitude expected.

We rely on AstraZeneca to provide critical support services in our efforts to market and sell ZURAMPIC in the U.S. and to conduct certain development, regulatory and safety activities for lesinurad.

As part of our acquisition of the Lesinurad Business, AstraZeneca has agreed to provide us with critical transition services, including services related to market access and reimbursement, sales and distribution and certain finance and financial reporting services. AstraZeneca is also obligated to undertake certain development, regulatory and safety activities relating to lesinurad, including certain activities related to the post-marketing clinical trial for ZURAMPIC required by the FDA and many activities for DUZALLO. We need to work collaboratively with AstraZeneca to ensure that such services are provided in an effective and timely manner. We have limited ability to control the amount or timing of resources that AstraZeneca devotes to such services. If AstraZeneca fails to devote sufficient time and resources to conducting such services, performs such services in a substandard manner, materially breaches its obligations to conduct such services or undergoes a change of control, it will delay or hinder our ability to successfully commercialize ZURAMPIC and will delay the potential approval of a regulatory application for DUZALLO. Additionally, if AstraZeneca fails to conduct and complete activities related to the post-marketing clinical trial for ZURAMPIC in an effective, compliant and timely manner, the FDA may impose additional restrictions on the use of ZURAMPIC until the post-marketing clinical trial is completed and the further development of lesinurad may be delayed.

We also rely on AstraZeneca to provide us with information about ZURAMPIC and other potential lesinurad products that may be critical to the development and the commercial success of such products in the U.S. For example, as the holder of the global safety database for lesinurad, AstraZeneca is responsible for coordinating the safety surveillance and adverse event reporting efforts worldwide with respect to lesinurad. We, and AstraZeneca's other licensees of lesinurad throughout the world, are required to submit safety data and information about adverse events related to ZURAMPIC and other potential lesinurad products to AstraZeneca. If AstraZeneca fails to maintain such

database or if AstraZeneca's other licensees do not report adverse events related to ZURAMPIC and, if developed, other lesinurad products, or fail to do so in a timely manner, we may not receive the information that we are required to report to the FDA regarding ZURAMPIC and lesinurad. The FDA may impose additional restrictions on the use of ZURAMPIC or other potential lesinurad products if a delay in reporting such adverse events occurs. In addition, AstraZeneca is responsible for notifying us of certain material intellectual property related to lesinurad that is developed by it or its other licensees of lesinurad. If AstraZeneca does not notify us of such intellectual property or AstraZeneca's licensees fail to report such intellectual property to AstraZeneca, or, in each case, fail to provide such information on a timely basis, we may not be able to commercialize ZURAMPIC and other potential lesinurad products as effectively or efficiently.

If any of our linaclotide partners undergoes a change in control or in management, this may adversely affect our collaborative relationship or the success of the commercialization of linaclotide in the U.S. or in the other countries where it is approved, or the ability to achieve regulatory approval, launch and commercialize linaclotide in our other partnered territories.

We work jointly and collaboratively with each of our partners on many aspects of the development, manufacturing and commercialization of linaclotide. In doing so, we have established relationships with several key members of the management teams of our linaclotide partners in functional areas such as development, quality, regulatory, drug safety and pharmacovigilance, operations, marketing, sales, field operations and medical science. Further, the success of our collaborations is highly dependent on the resources, efforts and skills of our partners and their key employees. As we and our partners commercialize linaclotide in the U.S. and the other countries where it is approved, and develop, launch and commercialize linaclotide in other parts of the world, the drug's success becomes more dependent on us maintaining highly collaborative and well aligned partnerships. If any of our linaclotide partners undergo a change of control or in management in the future, we would need to reestablish many relationships and confirm continued alignment on our development and commercialization strategy for linaclotide. Further, in connection with any change of control or in management, there is inherent uncertainty and disruption in operations, which could result in distraction, inefficiencies, and misalignment of priorities. As a result, in the event of a change of control or in management at one of our linaclotide partners, we cannot be sure that we will be able to successfully execute on our development and commercialization strategy for linaclotide in an effective and efficient manner and without disruption or reduced performance. Finally, any change of control or in management may result in a reprioritization of linaclotide within a partner's portfolio, or such partner may fail to maintain the financial or other resources necessary to continue supporting its portion of the development, manufacturing or commercialization of linaclotide.

If any of our linaclotide partners undergoes a change of control and the acquirer either is unable to perform such partner's obligations under its collaboration or license agreement with us or has a product that competes with linaclotide that such acquirer does not divest, we have the right to terminate the collaboration or license agreement and reacquire that partner's rights with respect to linaclotide. If we elect to exercise these rights in such circumstances, we will need to either establish the capability to develop, manufacture and commercialize linaclotide in that partnered territory on our own or we will need to establish a relationship with a new partner. We have assembled a team of specialists in manufacturing, quality, sales, marketing, payer, pricing and field operations, and specialized medical scientists, who represent the functional areas necessary for a successful commercial launch of a high potential, gastrointestinal therapy and who support the commercialization of LINZESS in the U.S. If Allergan was subject to a change of control that allowed us to further commercialize LINZESS in the U.S. on our own, and we chose to do so, we would need to enhance each of these functional aspects to replace the capabilities that Allergan was previously providing to the collaboration. Any such transition might result in a period of reduced efficiency or performance by our operations and commercialization teams, which could adversely affect our ability to commercialize LINZESS.

Although many members of our global operations, commercial and medical affairs teams have strategic oversight of, and a certain level of involvement in, their functional areas globally, we do not have corresponding operational capabilities in these areas outside of the U.S. If Allergan, Astellas or AstraZeneca was subject to a change of control that allowed us to continue linaclotide's development or commercialization anywhere outside of the U.S. on our own, and we chose to do so rather than establishing a relationship with a new partner, we would need to build operational capabilities in the relevant territory. In any of these situations, the timeline and likelihood of achieving regulatory approval and, ultimately, the commercialization of linaclotide could be negatively impacted.

We must work effectively and collaboratively with Allergan to market and sell LINZESS in the U.S. in order for it to achieve its maximum commercial potential.

We are working closely with Allergan to execute our joint commercialization plan for LINZESS. The commercialization plan includes an agreed upon marketing campaign that targets the physicians who see patients who could benefit from LINZESS treatment. Our marketing campaign also targets the adult men and women who suffer from IBS-C or CIC. Our commercialization plan also includes an integrated call plan for our sales forces to optimize the education of specific gastroenterologists and primary care physicians on whom our and Allergan's sales representatives call, and the frequency with which the representatives meet with them.

In order to optimize the commercial potential of LINZESS, we and Allergan must execute upon this commercialization plan effectively and efficiently. In addition, we and Allergan must continually assess and modify our commercialization plan in a coordinated and integrated fashion in order to adapt to the promotional response. Further, we and Allergan must continue to focus and refine our marketing campaign to ensure a clear and understandable physician-patient dialogue around IBS-C, CIC and the potential for LINZESS as an appropriate therapy. In addition, we and Allergan must provide our sales forces with the highest quality support, guidance and oversight in order for them to continue to effectively promote LINZESS to gastroenterologists and primary care physicians. If we and Allergan fail to perform these commercial functions in the highest quality manner and in accordance with our joint commercialization plan and related agreements, LINZESS will not achieve its maximum commercial potential and we may suffer financial harm. Our efforts to further target and engage adult patients with IBS-C or CIC may not effectively increase appropriate patient awareness or patient/physician dialogue, and may not increase the revenues that we generate from LINZESS.

We are subject to uncertainty relating to pricing and reimbursement policies in the U.S. which, if not favorable for our products, could hinder or prevent our products' commercial success.

Our and Allergan's ability to commercialize LINZESS and our ability to commercialize ZURAMPIC in the U.S. successfully depend in part on the coverage and reimbursement levels set by governmental authorities, private health insurers and other third-party payers. In determining whether to approve reimbursement for our products and at what level, we expect that third-party payers will consider factors that include the efficacy, cost effectiveness and safety of our products, as well as the availability of other treatments including generic prescription drugs and over-the-counter alternatives. Further, in order to maintain acceptable reimbursement levels and access for patients at copay levels that are reasonable and customary, we may face increasing pressure to offer discounts or rebates from list prices or discounts to a greater number of third-party payers or other unfavorable pricing modifications. Obtaining and maintaining favorable reimbursement can be a time consuming and expensive process, and there is no guarantee that we or Allergan (with respect to LINZESS) will be able to negotiate or continue to negotiate pricing terms with third-party payers at levels that are profitable to us, or at all. Certain third-party payers also require prior authorization for, or even refuse to provide, reimbursement for LINZESS, and others may do so in the future. Similarly, third-party payers may also require prior authorization for, or refuse to provide, reimbursement for ZURAMPIC. Our business would be materially adversely affected if we and Allergan are not able to receive approval for reimbursement of LINZESS and we are not able to receive approval for reimbursement of ZURAMPIC, in each case, from third-party payers on a broad, timely or satisfactory basis; if reimbursement is subject to overly broad or restrictive prior authorization requirements; or if reimbursement is not maintained at satisfactory levels or becomes subject to prior authorization. In addition, our business could be adversely affected if private health insurers, including managed care organizations, the Medicare or Medicaid programs or other reimbursing bodies or payers limit or reduce the indications for or conditions under which our products may be reimbursed.

We expect to experience pricing pressures in connection with the sale of LINZESS and ZURAMPIC, and our future products due to the healthcare reforms discussed below, as well as the trend toward programs aimed at reducing healthcare costs, the increasing influence of managed care, the ongoing debates on reducing government spending and additional legislative proposals. These healthcare reform efforts or any future legislation or regulatory actions aimed at controlling and reducing healthcare costs, including through measures designed to limit reimbursement, restrict access or impose unfavorable pricing modifications on pharmaceutical products, could impact our and our partners' ability to obtain or maintain reimbursement for our products at satisfactory levels, or at all, which could materially harm our business and financial results.

We and our linaclotide partners are subject to uncertainty relating to pricing and reimbursement policies outside the U.S., as well as risks relating to the improper importation of linaclotide and sale of counterfeit versions of linaclotide. If such policies are not favorable, or if linaclotide is improperly imported or is counterfeited, our business and financial results could be adversely affected.

In some foreign countries, particularly Canada, the countries of Europe and Japan, the pricing and payment of prescription pharmaceuticals is subject to governmental control. In these countries, pricing negotiations with governmental authorities can take six to 12 months or longer after the receipt of regulatory approval and product launch. Reimbursement sources are different in each country, and each country may include a combination of distinct potential payers, including private insurance and governmental payers. Some countries may restrict the range of medicinal products for which their national health insurance systems provide reimbursement and control the prices of medicinal products for human use. To obtain favorable reimbursement for the indications sought or pricing approval in some countries, we and our partners may be required to conduct a clinical trial that compares the cost and clinical effectiveness of our products, including linaclotide, to other available therapies. In addition, in countries in which linaclotide is the only approved therapy for a particular indication, such as CONSTELLA as the only prescription product approved for the symptomatic treatment of moderate to severe IBS-C in adults in Europe and LINZESS as the only prescription treatment approved for the treatment of adults with IBS-C in Japan, there may be disagreement as to what the most comparable product is, or if there even is one. Further, several countries have implemented government measures to either freeze or reduce pricing of pharmaceutical products. Many third-party payers and governmental authorities also consider the price for which the same product is being sold in other countries to determine their own pricing and reimbursement strategy, so if linaclotide is priced low or gets limited reimbursement in a particular country, this could result in similarly low pricing and reimbursement in other countries. If reimbursement for linaclotide is unavailable in any country in which reimbursement is sought, limited in scope or amount, or if pricing is set at or reduced to unsatisfactory levels, our and our partners' ability to successfully commercialize linaclotide in such country would be impacted negatively. Furthermore, if these measures prevent us or any of our partners from selling linaclotide on a profitable basis in a particular country, they could prevent the commercial launch or continued sale of linaclotide in that country.

CONSTELLA was first launched in certain European countries for the symptomatic treatment of moderate to severe IBS-C in adults in the second quarter of 2013 and our partner Allergan is currently commercializing CONSTELLA in a number of European countries, including the United Kingdom, Italy and Spain. In the fourth quarter of 2016, the Japanese Ministry of Health, Labor and Welfare granted our partner Astellas marketing approval for LINZESS for the treatment of IBS-C in adults. The pricing and reimbursement strategy is a key component of our partners' commercialization plans for CONSTELLA in Europe and LINZESS in Japan. Our revenues may suffer if our partners are unable to successfully and timely conclude reimbursement, price approval or funding processes and market CONSTELLA in key member states of the E.U. or LINZESS in Japan, or if coverage and reimbursement for either CONSTELLA or LINZESS is limited or reduced. If our partners are not able to obtain coverage, pricing or reimbursement on acceptable terms or at all, or if such terms change in any countries in its territory, our partners may not be able to, or may decide not to, sell either CONSTELLA or LINZESS in such countries.

We and our partners also face the risk that linaclotide is imported or reimported into markets with relatively higher prices from markets with relatively lower prices, which would result in a decrease of sales and any payments we receive from the affected market. Additionally, third parties may illegally produce, distribute and/or sell counterfeit or otherwise unfit or adulterated versions of linaclotide. In either case, we and our partners may not be able to detect or, if detected, prevent or prohibit the sale of such products, which could result in dangerous health consequences for patients, loss of confidence in us, our partners and our products, and adverse regulatory or legal consequences. Any of the foregoing could adversely impact our reputation, financial results and business.

Because we work with partners to develop, manufacture and commercialize linaclotide, we are dependent upon third parties, and our relationships with those third parties, in our efforts to commercialize LINZESS and to obtain regulatory approval for, and to commercialize, linaclotide in our other partnered territories.

Allergan played a significant role in the conduct of the clinical trials for linaclotide and in the subsequent collection and analysis of data, and Allergan holds the new drug application, or NDA, for LINZESS. In addition, we are commercializing LINZESS in the U.S. with Allergan. Allergan is also responsible for the development, regulatory approval and commercialization of linaclotide in countries worldwide other than Japan, China, Hong Kong and Macau. Allergan is commercializing LINZESS in Mexico and CONSTELLA in Canada, as well as commercializing

CONSTELLA in certain countries in Europe. Astellas, our partner in Japan, is responsible for completing the clinical programs and obtaining regulatory approval of linaclotide in its territory. Further, we are jointly overseeing the development, and will jointly oversee the commercialization, of linaclotide in China, Hong Kong and Macau through our collaboration with AstraZeneca, with AstraZeneca having primary responsibility for the local operational execution. Each of Astellas, AstraZeneca and Allergan is responsible for commercializing linaclotide in its respective territory, if approved. Each of our partners is responsible for reporting adverse event information from its territory to us. Finally, each of our partners, other than AstraZeneca, is responsible for drug product manufacturing of linaclotide and making it into finished goods (including bottling and packaging) for its respective territory. The integration of our efforts with our partners' efforts is subject to the uncertainty of the markets for pharmaceutical products in each partner's respective territories, and accordingly, these relationships must evolve to meet any new challenges that arise in those regions.

These integrated functions may not be carried out effectively and efficiently if we fail to communicate and coordinate with our linaclotide partners, and vice versa. Our linaclotide partnering strategy imposes obligations, risks and operational requirements on us as the central node in our global network of partners. If we do not effectively communicate with each partner and ensure that the entire network is making integrated and cohesive decisions focused on the global brand for linaclotide, linaclotide will not achieve its maximum commercial potential. As the holder of the global safety database for linaclotide, we are responsible for coordinating the safety surveillance and adverse event reporting efforts worldwide. If we are unsuccessful in doing so due to poor process, execution, oversight, communication, adjudication or otherwise, then our and our partners' ability to obtain and maintain regulatory approval of linaclotide will be at risk.

We have limited ability to control the amount or timing of resources that our partners devote to linaclotide. If any of our partners fails to devote sufficient time and resources to linaclotide, or if its performance is substandard, it will delay the potential submission or approval of regulatory applications for linaclotide, as well as the manufacturing and commercialization of linaclotide in the particular territory. A material breach by any of our partners of our collaboration or license agreement with such partner, or a significant disagreement between us and a partner, could also delay the regulatory approval and commercialization of linaclotide, potentially lead to costly litigation, and could have a material adverse impact on our financial condition. Moreover, although we have non-compete restrictions in place with each of our linaclotide partners, they may have relationships with other commercial entities, some of which may compete with us. If any of our partners assists our competitors, it could harm our competitive position.

Even though LINZESS is approved by the FDA for the treatment of adults with IBS-C or CIC and ZURAMPIC is approved by the FDA for the treatment of hyperuricemia associated with uncontrolled gout, LINZESS and ZURAMPIC face post-approval development and regulatory requirements, which present additional challenges.

In August 2012, the FDA approved LINZESS as a once-daily treatment for adult men and women suffering from IBS-C or CIC, and in December 2015, the FDA approved ZURAMPIC for use in combination with an XOI for the treatment of hyperuricemia associated with uncontrolled gout. Both LINZESS and ZURAMPIC are subject to ongoing FDA requirements, including those governing the testing, manufacturing, labeling, packaging, storage, advertising, promotion, sale, distribution, recordkeeping and submission of safety and other post-market information.

LINZESS is contraindicated in pediatric patients up to 6 years of age based on nonclinical data from studies in neonatal mice approximately equivalent to human pediatric patients less than 2 years of age. There is also a boxed warning advising physicians to avoid the use of LINZESS in pediatric patients 6 through 17 years of age. This warning is based on data in young juvenile mice and the lack of clinical safety and efficacy data in pediatric patients of any age group. We and Allergan have established a nonclinical and clinical post-marketing plan with the FDA to understand the safety and efficacy of LINZESS in pediatric patients, and have initiated two Phase II clinical pediatric studies in IBS-C patients age seven to 17 and functional constipation patients age six to 17. Our ability to conduct clinical studies in younger pediatric patients will depend, in part, on the safety and efficacy data from our clinical studies in older pediatric patients. Our ability to ever expand the indication for LINZESS to pediatrics will depend on, among other things, our successful completion of pediatric clinical studies. We and Allergan have also committed to certain nonclinical and clinical studies aimed at understanding: (a) whether orally administered linaclotide can be detected in breast milk, (b) the potential for antibodies to be developed to linaclotide, and if so, (c) whether antibodies specific for linaclotide could have any therapeutic or safety implications. We expect to complete these studies over the next two to four years.

ZURAMPIC is contraindicated in patients with severe renal impairment or end-stage renal diseases, kidney transplant recipients, patients on dialysis or patients with tumor lysis syndrome or Lesch-Nyhan syndrome. ZURAMPIC

is approved for use in combination with an XOI for the treatment of hyperuricemia associated with uncontrolled gout, and there is a boxed warning about the risk of acute renal failure with ZURAMPIC, which is more common when ZURAMPIC is used without an XOI. The FDA has required a post-marketing clinical study to further evaluate the renal and cardiovascular safety of ZURAMPIC, and has required that enrollment include patients with moderate renal impairment.

These post-approval requirements impose burdens and costs on us, and we are obligated to reimburse AstraZeneca up to $100 million over up to ten years for completion of the post-marketing clinical study for ZURAMPIC. Additionally, as the holder of the approved NDA for ZURAMPIC, we are obligated to monitor and report adverse events and any failure of ZURAMPIC to meet the specifications in the NDA, to submit new or supplemental applications and to obtain FDA approval for certain changes to ZURAMPIC, including changes to its product labeling and manufacturing process. Failure to effectively and appropriately conduct and complete the required studies relating to LINZESS and ZURAMPIC, monitor and report adverse events and meet our other post-approval commitments would lead to negative regulatory action at the FDA, which could include withdrawal of regulatory approval of our products for their currently approved indications and patient populations.

Manufacturers of drug products and their facilities are subject to continual review and periodic inspections by the FDA and other regulatory authorities for compliance with GMP and other applicable regulations. If we or a regulatory agency discovers previously unknown problems with a product, such as adverse events of unanticipated severity or frequency, or problems with a facility where the product is manufactured, a regulatory agency may impose restrictions on that product or the manufacturer, including withdrawal of the product from the market or suspension of manufacturing. If we, our partners or the manufacturing facilities for our products fail to comply with applicable regulatory requirements, a regulatory agency may take the following actions, among others:

- issue warning letters or untitled letters;
- impose civil or criminal penalties;
- suspend or withdraw regulatory approval;
- suspend any ongoing clinical trials;
- refuse to approve pending applications or supplements to applications submitted by us;
- impose restrictions on operations, including costly new manufacturing requirements; or
- seize or detain products or require us to initiate a product recall.

If we fail to comply with our obligations under our license with AstraZeneca, we could lose rights to the Lesinurad Business.

We are a party to a license agreement with AstraZeneca for exclusive rights to ZURAMPIC and any other products containing lesinurad in the U.S. Our license agreement with AstraZeneca imposes various milestone payment, royalty, insurance and other obligations on us. If we fail to comply with our obligations, AstraZeneca may have the right to terminate the license agreement, in which event we would not be able to continue commercializing ZURAMPIC or developing any other lesinurad product that is covered by the license. Termination of the license agreement or reduction or elimination of our licensed rights may result in our having to negotiate new or reinstated licenses with less favorable terms, and, if we lose rights to the Lesinurad Business, ceasing development and commercial activities related to lesinurad, adversely affecting our business.

Even though linaclotide is approved for marketing in the U.S. and in a number of other countries, we or our partners may never receive approval to commercialize linaclotide in additional parts of the world.

In order to market any products outside of the countries where linaclotide is approved, we or our partners must comply with numerous and varying regulatory requirements of other jurisdictions regarding safety and efficacy. Approval procedures vary among jurisdictions and can involve product testing and administrative review periods

different from, and greater than, those in the U.S. and the other countries where linaclotide is approved. Potential risks include that the regulatory authorities:

- may not deem linaclotide safe and effective;
- may not find the data from nonclinical studies and clinical trials sufficient to support approval;
- may not approve of manufacturing processes and facilities;
- may not approve linaclotide for any or all indications or patient populations for which approval is sought;
- may require significant warnings or restrictions on use to the product label for linaclotide; or
- may change their approval policies or adopt new regulations.

If any of the foregoing were to occur, our receipt of regulatory approval in the applicable jurisdiction could be delayed or we may never receive approval at all. Further, regulatory approval in one jurisdiction does not ensure regulatory approval in another, but a failure or delay in obtaining regulatory approval in one jurisdiction may have a negative effect on the regulatory processes in others. If linaclotide is not approved for all indications or patient populations or with the label requested, this would limit the uses of linaclotide and have an adverse effect on its commercial potential or require costly post-marketing studies.

We face potential product liability exposure, and, if claims brought against us are successful, we could incur substantial liabilities.

The use of our product candidates in clinical trials and the sale of marketed products expose us to product liability claims. If we do not successfully defend ourselves against product liability claims, we could incur substantial liabilities. In addition, regardless of merit or eventual outcome, product liability claims may result in:

- decreased demand for approved products;
- impairment of our business reputation;
- withdrawal of clinical trial participants;
- initiation of investigations by regulators;
- litigation costs;
- distraction of management's attention from our primary business;
- substantial monetary awards to patients or other claimants;
- loss of revenues; and
- the inability to commercialize our product candidates.

We currently have product liability insurance coverage for the commercial sale of linaclotide and lesinurad and for the clinical trials of our product candidates which is subject to industry-standard terms, conditions and exclusions. Our insurance coverage may not be sufficient to reimburse us for expenses or losses associated with claims. Moreover, insurance coverage is becoming increasingly expensive, and, in the future, we may not be able to maintain insurance coverage at a reasonable cost or in sufficient amounts to protect us against losses. On occasion, large judgments have been awarded in lawsuits based on drugs that had unanticipated side effects. A successful product liability claim or series of claims could cause our stock price to decline and, if judgments exceed our insurance coverage, could decrease our cash and adversely affect our business.

We face competition and new products may emerge that provide different or better alternatives for treatment of the conditions that our products are approved to treat.

The pharmaceutical industry and the markets in which we operate are intensely competitive. We compete in the marketing and sale of our products, the development of new products and the acquisition of rights to new products with commercial potential. Certain of our competitors have substantially greater financial, technical and human resources than us. Mergers and acquisitions in the pharmaceutical industry may result in even more resources being concentrated in our competitors. Competition may increase further as a result of advances made in the commercial applicability of technologies and greater availability of capital for investment in these fields. Additionally, new developments, including the development of other drug technologies and methods of preventing the incidence of disease, occur in the pharmaceutical and medical technology industries at a rapid pace. These developments may render our products obsolete or noncompetitive.

Our products compete with certain prescription therapies and over-the-counter products for the treatment of the indications for which they are approved, or their associated symptoms, and in many cases with products that have attained significant levels of market acceptance. The availability of prescription competitors and over-the-counter products for such conditions could limit the demand, and the price we are able to charge, for our products unless we are able to achieve market acceptance among the medical community and patients and differentiate our products on the basis of their cost and/or actual or perceived benefits. For example, Takeda Pharmaceuticals Limited's AMITIZA (lubiprostone) is approved by the FDA for sale in the U.S. for the treatment of IBS-C, CIC and opioid-induced constipation and Synergy Pharmaceuticals, Inc.'s, or Synergy, TRULANCE (plecanatide) is approved by the FDA for sale in the U.S. for the treatment of adults with CIC. Synergy is also developing plecanatide for the treatment of IBS-C. Additionally, we believe other companies are developing products which could compete with our products, should they be approved by the FDA or foreign regulatory authorities. Currently, there are other compounds in late stage development and other potential competitors are in earlier stages of development for the treatment of the indications for which our products are approved. If our current or potential competitors are successful in completing drug development for their drug candidates and obtain approval from the FDA or foreign regulatory authorities, they could limit the demand for our products.

We will incur significant liability if it is determined that we are promoting any "off-label" uses of our products.

Physicians are permitted to prescribe drug products and medical devices for uses that are not described in the product's labeling and that differ from those approved by the FDA or other applicable regulatory agencies. Such "off-label" uses are common across medical specialties. Although the FDA and other regulatory agencies do not regulate a physician's choice of treatments, the FDA and other regulatory agencies do restrict communications on the subject of off-label use. Companies are not permitted to promote drugs or medical devices for off-label uses. Accordingly, we do not permit promotion of any approved product that we develop, license, commercialize, promote, co-promote or otherwise partner for any indication, population or use not described in such product's label. The FDA and other regulatory and enforcement authorities actively enforce laws and regulations prohibiting promotion of off-label uses and the promotion of products for which marketing approval has not been obtained. A company that is found to have promoted off-label uses will be subject to significant liability, including civil and administrative remedies as well as criminal sanctions.

Notwithstanding the regulatory restrictions on off-label promotion, the FDA and other regulatory authorities allow companies to engage in truthful, non-misleading, and non-promotional scientific exchange concerning their products. We intend to engage in medical education activities and communicate with healthcare providers in compliance with all applicable laws, regulatory guidance and industry best practices. Although we believe we have put in place a robust compliance program, which is designed to ensure that all such activities are performed in a legal and compliant manner, we cannot be certain that our program will address all areas of potential exposure and the risks in this area cannot be entirely eliminated.

If we fail to comply with healthcare and other regulations, we could face substantial penalties and our business, operations and financial condition could be adversely affected.

The products that we promote are marketed in the U.S. and/or covered by federal healthcare programs, and, as a result, certain federal and state healthcare laws and regulations pertaining to product promotion and fraud and abuse are applicable to, and may affect, our business. These laws and regulations include:

- federal healthcare program anti-kickback laws, which prohibit, among other things, persons from soliciting, receiving or providing remuneration, directly or indirectly, to induce either the referral of an individual, for an item or service or the purchasing or ordering of a good or service, for which payment may be made under federal healthcare programs such as Medicare and Medicaid;

- federal false claims laws which prohibit, among other things, individuals or entities from knowingly presenting, or causing to be presented, information or claims for payment from Medicare, Medicaid, or other third-party payers that are false or fraudulent, and which may apply to us for reasons including providing coding and billing advice to customers;

- the federal Health Insurance Portability and Accountability Act of 1996, which prohibits executing a scheme to defraud any healthcare benefit program or making false statements relating to healthcare matters and which also imposes certain requirements relating to the privacy, security and transmission of individually identifiable health information;

- the Federal Food, Drug, and Cosmetic Act, which among other things, strictly regulates drug product and medical device marketing, prohibits manufacturers from marketing such products prior to approval or for off-label use and regulates the distribution of samples;

- federal laws that require pharmaceutical manufacturers to report certain calculated product prices to the government or provide certain discounts or rebates to government authorities or private entities, often as a condition of reimbursement under government healthcare programs;

- the so-called "federal sunshine" law, which requires pharmaceutical and medical device companies to monitor and report certain financial interactions with physicians and other healthcare professionals and healthcare organizations to the federal government for re-disclosure to the public; and

- state law equivalents of the above federal laws, such as anti-kickback and false claims laws which may apply to items or services reimbursed by any third-party payer, including commercial insurers, state transparency laws, state laws limiting interactions between pharmaceutical manufacturers and members of the healthcare industry, and state laws governing the privacy and security of health information in certain circumstances, many of which differ from each other in significant ways and often are not preempted by federal laws, thus complicating compliance efforts.

Our global activities are subject to the U.S. Foreign Corrupt Practices Act which prohibits corporations and individuals from paying, offering to pay, or authorizing the payment of anything of value to any foreign government official, government staff member, political party, or political candidate in an attempt to obtain or retain business or to otherwise influence a person working in an official capacity. We are also subject to similar anti-bribery laws in the other countries in which we do business.

If our operations are found to be in violation of any of the laws described above or any other laws, rules or regulations that apply to us, we will be subject to penalties, including civil and criminal penalties, damages, fines and the curtailment or restructuring of our operations. Any penalties, damages, fines, curtailment or restructuring of our operations could adversely affect our ability to operate our business and our financial results. Although compliance programs can mitigate the risk of investigation and prosecution for violations of these laws, rules or regulations, we cannot be certain that our program will address all areas of potential exposure and the risks in this area cannot be entirely eliminated, particularly because the requirements and government interpretations of the requirements in this space are constantly evolving. Any action against us for violation of these laws, rules or regulations, even if we successfully defend against it, could cause us to incur significant legal expenses and divert our management's attention from the

operation of our business, as well as damage our business or reputation. Moreover, achieving and sustaining compliance with applicable federal and state privacy, security, fraud and reporting laws may prove costly.

Healthcare reform and other governmental and private payer initiatives may have an adverse effect upon, and could prevent, our products' or product candidates' commercial success.

The U.S. government and individual states have been aggressively pursuing healthcare reform, as evidenced by the passing of the Patient Protection and Affordable Care Act, as modified by the Health Care and Education Reconciliation Act of 2010, or the ACA. These healthcare reform laws contain several cost containment measures that could adversely affect our future revenue, including, for example, increased drug rebates under Medicaid for brand name prescription drugs, extension of Medicaid rebates to Medicaid managed care plans, and extension of so-called 340B discounted pricing on pharmaceuticals sold to certain healthcare providers. Additional provisions of the healthcare reform laws that may negatively affect our future revenue and prospects for profitability include the assessment of an annual fee based on our proportionate share of sales of brand name prescription drugs to certain government programs, including Medicare and Medicaid, as well as mandatory discounts on pharmaceuticals sold to certain Medicare Part D beneficiaries. Other aspects of healthcare reform, such as expanded government enforcement authority and heightened standards that could increase compliance-related costs, could also affect our business. In addition, we face uncertainties because there may be federal legislative and administrative efforts to repeal, substantially modify or invalidate some or all of the provisions of the ACA. However, we cannot predict the ultimate content, timing or effect of any healthcare reform legislation or action, or its impact on us.

In addition to governmental efforts in the U.S., foreign jurisdictions as well as private health insurers and managed care plans are likely to continue challenging manufacturers' ability to obtain reimbursement, as well as the level of reimbursement, for pharmaceuticals and other healthcare-related products and services. These cost-control initiatives could significantly decrease the available coverage and the price we might establish for our products, which would have an adverse effect on our financial results.

The Food and Drug Administration Amendments Act of 2007 also provides the FDA enhanced post-marketing authority, including the authority to require post-marketing studies and clinical trials, labeling changes based on new safety information, and compliance with risk evaluations and mitigation strategies approved by the FDA. We and Allergan have established a nonclinical and clinical post-marketing plan with the FDA to understand the safety and efficacy of LINZESS in pediatrics and AstraZeneca is establishing a clinical post-marketing plan with the FDA to further evaluate the renal and cardiovascular safety of ZURAMPIC, each of which is discussed above. The FDA's exercise of this authority has resulted (and is expected to continue to result) in increased development-related costs following the commercial launch of our products, and could result in potential restrictions on the sale and/or distribution of our products, even in such products' approved indications and patient populations.

In pursuing our growth strategy, we will incur a variety of costs and may devote resources to potential opportunities that are never completed or for which we never receive the benefit. Our failure to successfully discover, acquire, develop and market additional product candidates or approved products would impair our ability to grow and adversely affect our business.

As part of our growth strategy, we intend to explore further linaclotide and lesinurad development opportunities. We and Allergan are exploring development opportunities to enhance the clinical profile of LINZESS by studying linaclotide in additional indications, populations and formulations to assess its potential to treat various GI conditions. Additionally, we have rights to develop products containing lesinurad as an active ingredient in all indications, populations and formulations in the U.S. and we are currently evaluating such development opportunities, as well as opportunities within its approved indications, populations and formulations. These development efforts may fail or may not increase the revenues that we generate from our products. Furthermore, they may result in adverse events, or perceived adverse events, in certain patient populations that are then attributed to the currently approved patient population, which may result in adverse regulatory action at the FDA or, with respect to linaclotide, in other countries or harm our products' reputation in the marketplace, each of which could materially harm our revenues from our products.

We are also pursuing various other programs in our pipeline. We may spend several years and make significant investments in developing any current or future internal product candidate, and failure may occur at any point. Our product candidates are in various stages of development and must satisfy rigorous standards of safety and efficacy before they can be approved for sale by the FDA. To satisfy these standards, we must allocate resources among our various development programs and we must engage in costly and lengthy discovery and development efforts, which are subject

to unanticipated delays and other significant uncertainties. Despite our efforts, our product candidates may not offer therapeutic or other improvement over existing competitive drugs, be proven safe and effective in clinical trials, or meet applicable regulatory standards. It is possible that none of the product candidates we are developing will be approved for commercial sale, which would impair our ability to grow.

We have ongoing or planned nonclinical and clinical trials for linaclotide, lesinurad and a number of our internal product candidates, and the strength of our company's pipeline will depend in large part on the outcomes of these studies. Many companies in the pharmaceutical industry have suffered significant setbacks in clinical trials even after achieving promising results in earlier nonclinical or clinical trials. The findings from our completed nonclinical studies may not be replicated in later clinical trials, and our clinical trials may not be predictive of the results we may obtain in later-stage clinical trials or of the likelihood of regulatory approval. Results from our clinical trials and findings from our nonclinical studies could lead to abrupt changes in our development activities, including the possible limitation or cessation of development activities associated with a particular product candidate or program. Furthermore, our analysis of data obtained from nonclinical and clinical activities is subject to confirmation and interpretation by the FDA and other applicable regulatory authorities, which could delay, limit or prevent regulatory approval. Satisfaction of FDA or other applicable regulatory requirements is costly, time-consuming, uncertain and subject to unanticipated delays.

In addition, because our internal research capabilities are limited, we may be dependent upon pharmaceutical and biotechnology companies, academic scientists and other researchers to sell or license products or technology to us. The success of this strategy depends partly upon our ability to identify, select, discover and acquire promising pharmaceutical product candidates and products. The process of proposing, negotiating and implementing a license or acquisition of a product candidate or approved product is lengthy and complex. Other companies, including some with substantially greater financial, marketing and sales resources, may compete with us for the license or acquisition of product candidates and approved products. We have limited resources to identify and execute the acquisition or in-licensing of third-party products, businesses and technologies and integrate them into our current infrastructure. Moreover, we may devote resources to potential acquisitions or in-licensing opportunities that are never completed, or we may fail to realize the anticipated benefits of such efforts. We may not be able to acquire the rights to additional products or product candidates on terms that we find acceptable, or at all.

In addition, such acquisitions may entail numerous operational and financial risks, including:

- exposure to unknown liabilities;
- disruption of our business and diversion of our management's time and attention to develop acquired products, product candidates or technologies;
- incurrence of substantial debt, dilutive issuances of securities or depletion of cash to pay for acquisitions;
- higher than expected acquisition and integration costs;
- difficulty in combining the operations and personnel of any acquired businesses with our operations and personnel;
- increased amortization expenses;
- impairment of relationships with key suppliers or customers of any acquired businesses due to changes in management and ownership; and
- inability to motivate key employees of any acquired businesses.

Furthermore, we may have little or no insight or control over the development and commercialization of any product that we have in-licensed outside the licensed territory. If other licensees do not effectively develop or commercialize any such product outside the licensed territory, our reputation or the reputation of any such product may be impacted. Also, any product candidate that we acquire may require additional development efforts prior to commercial sale, including extensive clinical testing and approval by the FDA and applicable foreign regulatory authorities. All product candidates are prone to risks of failure typical of pharmaceutical product development, including the possibility that a product candidate will not be shown to be sufficiently safe and effective for approval by regulatory authorities.

Delays in the completion of clinical testing of any of our product candidates could result in increased costs and delay or limit our ability to generate revenues.

Delays in the completion of clinical testing could significantly affect our product development costs. We do not know whether planned clinical trials will be completed on schedule, if at all. The commencement and completion of clinical trials can be delayed for a number of reasons, including delays related to:

- obtaining regulatory approval to commence a clinical trial;
- reaching agreement on acceptable terms with prospective clinical research organizations, or CROs, and trial sites, the terms of which can be subject to extensive negotiation and may vary significantly among different CROs and trial sites;
- manufacturing sufficient quantities of a product candidate for use in clinical trials;
- obtaining institutional review board approval to conduct a clinical trial at a prospective site;
- recruiting and enrolling patients to participate in clinical trials for a variety of reasons, including competition from other clinical trial programs for the treatment of similar conditions; and
- maintaining patients who have initiated a clinical trial but may be prone to withdraw due to side effects from the therapy, lack of efficacy or personal issues, or who are lost to further follow-up.

Clinical trials may also be delayed as a result of ambiguous or negative interim results. In addition, a clinical trial may be suspended or terminated by us, an institutional review board overseeing the clinical trial at a clinical trial site (with respect to that site), the FDA, or other regulatory authorities due to a number of factors, including:

- failure to conduct the clinical trial in accordance with regulatory requirements or the study protocols;
- inspection of the clinical trial operations or trial sites by the FDA or other regulatory authorities resulting in the imposition of a clinical hold;
- unforeseen safety issues; or
- lack of adequate enrollment or funding to continue the clinical trial.

Additionally, changes in regulatory requirements and guidance may occur, and we may need to amend clinical trial protocols to reflect these changes. Each protocol amendment would require institutional review board review and approval, which may adversely impact the costs, timing or successful completion of the associated clinical trials. If we or our partners terminate or experience delays in the completion of any clinical trials, the commercial prospects for our product candidates may be harmed, and our ability to generate product revenues will be delayed. In addition, many of the factors that cause, or lead to, a delay in the commencement or completion of clinical trials may also ultimately lead to the denial of regulatory approval.

We may not be able to manage our business effectively if we lose any of our current management team or if we are unable to attract and motivate key personnel.

We may not be able to attract or motivate qualified management and scientific, clinical, operations and commercial personnel in the future due to the intense competition for qualified personnel among biotechnology, pharmaceutical and other businesses, particularly in the greater-Boston area. If we are not able to attract and motivate necessary personnel to accomplish our business objectives, we will experience constraints that will significantly impede the achievement of our objectives.

We are highly dependent on the drug discovery, development, regulatory, commercial, financial and other expertise of our management, particularly Peter M. Hecht, Ph.D., our chief executive officer; Mark G. Currie, Ph.D., our senior vice president, chief scientific officer and president of research and development; Tom Graney, our chief financial officer and senior vice president, finance and corporate strategy; Thomas A. McCourt, our senior vice president,

marketing and sales and chief commercial officer; and Halley E. Gilbert, our senior vice president, chief legal officer, and secretary. Transitions in our senior management team may result in operational disruptions, and our business may be harmed as a result. In addition to the competition for personnel, the Boston area in particular is characterized by a high cost of living. As such, we could have difficulty attracting experienced personnel to our company and may be required to expend significant financial resources in our employee recruitment efforts.

We also have scientific and clinical advisors who assist us in formulating our product development, clinical strategies and our global supply chain plans, as well as sales and marketing advisors who have assisted us in our commercialization strategy and brand plan for linaclotide and lesinurad. These advisors are not our employees and may have commitments to, or consulting or advisory contracts with, other entities that may limit their availability to us, or may have arrangements with other companies to assist in the development and commercialization of products that may compete with ours.

Security breaches and other disruptions could compromise our information and expose us to liability, which would cause our business and reputation to suffer.

In the ordinary course of our business, we collect and store sensitive data, including intellectual property, our proprietary business information and that of our suppliers and business partners, as well as personally identifiable information of our patients, clinical trial participants and employees. We also have outsourced elements of our information technology structure, and as a result, we are managing independent vendor relationships with third parties who may or could have access to our confidential information. Similarly, our business partners and other third party providers possess certain of our sensitive data. The secure maintenance of this information is critical to our operations and business strategy. Despite our security measures, our information technology and infrastructure may be vulnerable to attacks by hackers or breached due to employee error, malfeasance or other disruptions. We, our partners, vendors and other third party providers could be susceptible to third party attacks on our, and their, information security systems, which attacks are of ever-increasing levels of sophistication and are made by groups and individuals with a wide range of motives and expertise, including criminal groups. Any such breach could compromise our, and their, networks and the information stored there could be accessed, publicly disclosed, lost or stolen. Any such access, disclosure or other loss of information could result in legal claims or proceedings, liability under laws that protect the privacy of personal information, disrupt our operations, and damage our reputation, any of which could adversely affect our business.

Our business involves the use of hazardous materials, and we must comply with environmental laws and regulations, which can be expensive and restrict how we do business.

Our activities involve the controlled storage, use and disposal of hazardous materials. We are subject to federal, state, city and local laws and regulations governing the use, manufacture, storage, handling and disposal of these hazardous materials. Although we believe that the safety procedures we use for handling and disposing of these materials comply with the standards prescribed by these laws and regulations, we cannot eliminate the risk of accidental contamination or injury from these materials. In the event of an accident, local, city, state or federal authorities may curtail the use of these materials and interrupt our business operations. We do not currently maintain hazardous materials insurance coverage.

Risks Related to Intellectual Property

Limitations on the patent rights relating to our products and our product candidates may limit our ability to prevent third parties from competing against us.

Our success depends on our ability to obtain and maintain patent protection for our products and product candidates, preserve our trade secrets, prevent third parties from infringing upon our proprietary rights and operate without infringing upon the proprietary rights of others.

The strength of patents in the pharmaceutical industry involves complex legal and scientific questions and can be uncertain. Patent applications in the U.S. and most other countries are confidential for a period of time until they are published, and publication of discoveries in scientific or patent literature typically lags actual discoveries by several months or more. As a result, we cannot be certain that we or our licensors were the first to conceive inventions covered by our patents and pending patent applications or that we or our licensors were the first to file patent applications for such inventions. In addition, we cannot be certain that our patent applications will be granted, that any issued patents

will adequately protect our intellectual property, or that such patents will not be challenged, narrowed, invalidated or circumvented.

We have several issued patents and pending applications in the U.S. related to LINZESS, including a LINZESS composition of matter and methods of use patent (U.S. Patent 7,304,036) and two patents relating to our commercial, room temperature stable formulation of linaclotide and methods of using this formulation. We also have additional U.S. patents and applications covering processes for making LINZESS, formulations and dosing regimens thereof, and molecules related to LINZESS. Although none of these issued patents currently is subject to a patent reexamination or review, we cannot guarantee that they will not be subject to reexamination or review by the U.S. Patent and Trademark Office, or the USPTO, in the future. If any or all of our LINZESS-related patents were invalidated, we would still have at least five years of marketing exclusivity under the Hatch-Waxman Act from FDA approval of LINZESS. We believe that each of the patents in our linaclotide patent portfolio was rightfully issued and the portfolio gives us sufficient freedom to operate; however, if any of our present or future patents is invalidated, this could have an adverse effect on our business and financial results, particularly for the period beyond five years following marketing approval. In March 2013, an opposition to one of our granted patents covering linaclotide was filed in Europe. In April 2015, the patent was upheld in its entirety by the European Patent Office, affirming the strength of our intellectual property and our belief that the opposition was without merit. We believe that this patent was appropriately granted but we cannot be certain of this until the opposition proceedings, including the associated appeals process, are complete. While the opposition is ongoing, we will incur additional expense and be required to focus additional efforts on the proceedings. Moreover, a successful outcome in the opposition does not preclude a later challenge to this or other of our patents in the courts. Even if this patent were ultimately found to be invalid, we have other composition of matter- and use-related linaclotide patents that are granted and in force, and we believe these patents provide strong and sufficient patent protection in Europe.

We received an exclusive license from AstraZeneca for several issued patents and pending applications in the U.S. related to ZURAMPIC, including a ZURAMPIC composition of matter patent (U.S. Patent 8,003,681), several patents directed to a ZURAMPIC pharmaceutical composition and methods of use, and patents and applications relating to polymorphic forms of lesinurad and methods of manufacturing lesinurad. Although none of these issued patents currently is subject to a patent reexamination or review, we cannot guarantee that they will not be subject to reexamination or review by the USPTO in the future. If any or all of the ZURAMPIC-related patents were invalidated, we would still have at least five years of marketing exclusivity under the Hatch-Waxman Act from FDA approval of ZURAMPIC. We believe that each of the patents in AstraZeneca's U.S. lesinurad patent portfolio was rightfully issued and the portfolio gives us sufficient freedom to operate; however, if any of AstraZeneca's present or future lesinurad patents is invalidated, this could have an adverse effect on our business and financial results, particularly for the period beyond five years following marketing approval.

Furthermore, the America Invents Act, which was signed into law in 2011, has made several major changes in the U.S. patent statutes. These changes permit third parties to challenge our patents more easily and create uncertainty with respect to the interpretation and practice of U.S. patent law.

We also rely upon unpatented trade secrets, unpatented know-how and continuing technological innovation to develop and maintain our competitive position, which we seek to protect, in part, by confidentiality agreements with our employees and our partners and consultants. We also have agreements with our employees and selected consultants that obligate them to assign their inventions to us. It is possible, however, that technology relevant to our business will be independently developed by a person that is not a party to such an agreement. Furthermore, if the employees and consultants that are parties to these agreements breach or violate the terms of these agreements, we may not have adequate remedies, and we could lose our trade secrets through such breaches or violations. Additionally, our trade secrets could otherwise become known or be independently discovered by our competitors.

In addition, the laws of certain foreign countries do not protect proprietary rights to the same extent or in the same manner as the U.S., and, therefore, we may encounter problems in protecting and defending our intellectual property in certain foreign jurisdictions.

If we are sued for infringing intellectual property rights of third parties, it will be costly and time consuming, and an unfavorable outcome in such litigation could have a material adverse effect on our business.

Our commercial success depends on our ability, and the ability of our partners, to develop, manufacture, market and sell our products and use our proprietary technologies without infringing the proprietary rights of third parties.

Numerous U.S. and foreign issued patents and pending patent applications, which are owned by third parties, exist in the fields in which we and our partners are developing products. As the biotechnology and pharmaceutical industry expands and more patents are issued, the risk increases that our potential products may give rise to claims of infringement of the patent rights of others. There may be issued patents of third parties of which we are currently unaware that may be infringed by linaclotide, lesinurad or our product candidates. Because patent applications can take many years to issue, there may be currently pending applications which may later result in issued patents that linaclotide, lesinurad or our product candidates may infringe.

We may be exposed to, or threatened with, litigation by third parties alleging that linaclotide, lesinurad or our product candidates infringe their intellectual property rights. If linaclotide, lesinurad or one of our product candidates is found to infringe the intellectual property rights of a third party, we or our partners could be enjoined by a court and required to pay damages and could be unable to develop or commercialize linaclotide, lesinurad or the applicable product candidate unless we obtain a license to the intellectual property rights. A license may not be available to us on acceptable terms, if at all. In addition, during litigation, the counter-party could obtain a preliminary injunction or other equitable relief which could prohibit us from making, using or selling our products, pending a trial on the merits, which may not occur for several years.

There is a substantial amount of litigation involving patent and other intellectual property rights in the biotechnology and pharmaceutical industries generally. If a third party claims that we or our partners infringe its intellectual property rights, we may face a number of issues, including, but not limited to:

- infringement and other intellectual property claims which, regardless of merit, may be expensive and time-consuming to litigate and may divert our management's attention from our core business;
- substantial damages for infringement, which we may have to pay if a court decides that the product at issue infringes on or violates the third party's rights, and, if the court finds that the infringement was willful, we could be ordered to pay treble damages and the patent owner's attorneys' fees;
- a court prohibiting us from selling our product unless the third party licenses its rights to us, which it is not required to do;
- if a license is available from a third party, we may have to pay substantial royalties, fees or grant cross-licenses to our intellectual property rights; and
- redesigning our products so they do not infringe, which may not be possible or may require substantial monetary expenditures and time.

We have received notices of Paragraph IV certifications related to linaclotide in conjunction with abbreviated new drug applications, or ANDAs, filed by generic drug manufacturers, and may receive additional notices from others in the future. We have, and may continue to, become involved in legal proceedings to protect or enforce the patents relating to our products and our product candidates, which could be expensive and time consuming, and unfavorable outcomes in such proceedings could have a material adverse effect on our business.

Competitors may infringe the patents relating to our products and our product candidates or may assert that such patents are invalid. To counter ongoing or potential infringement or unauthorized use, we may be required to file infringement claims, which can be expensive and time-consuming. Litigation with generic manufacturers has become increasingly common in the biotechnology and pharmaceutical industries. In addition, in an infringement or invalidity proceeding, a court or patent administrative body may determine that a patent of ours is not valid or is unenforceable, or may refuse to stop the other party from using the technology at issue on the grounds that our patents do not cover the technology in question. Generic drug manufacturers were first able to file ANDAs for generic versions of LINZESS in August 2016 and will first be able to file ANDAs in December 2019 for ZURAMPIC, but we may not become aware of these filings for several months after any such submission due to procedures specified under applicable FDA regulations. When filing an ANDA for one of our products, a generic drug manufacturer may choose to challenge one or more of the patents that cover such product. As such, we may need to protect our intellectual property rights by bringing legal proceedings against the generic drug manufacturer.

We and Allergan have received Paragraph IV certification notice letters, or Notice Letters, regarding ANDAs submitted to the FDA by generic drug manufacturers requesting approval to engage in commercial manufacture, use,

sale and offer for sale of linaclotide capsules (145 mcg and 290 mcg), proposed generic versions of our FDA-approved drug LINZESS. For additional information relating to such ANDAs, see Item 3, Legal Proceedings, elsewhere in this Annual Report on Form 10-K. Frequently, innovators receive multiple ANDA filings. Consequently, we expect to receive additional notice letters regarding ANDAs submitted to the FDA, and may receive amendments to the Notice Letters. After evaluation, we may file patent infringement lawsuits or take other action against the companies making such ANDA filings.

If a patent infringement suit has been filed within 45 days of receipt of a Notice Letter, the FDA is not permitted to approve any ANDA that is the subject of such lawsuit for 30 months from the date of the NDA holder's and patent owner's receipt of the ANDA filer's Notice Letter, or until a court decides that the relevant patents are invalid, unenforceable and/or not infringed. In the case of suits filed before expiration of the new chemical entity, or NCE, exclusivity period for a particular drug, the 30-month stay would be calculated from the end of the applicable NCE exclusivity period. In addition to shortening the 30-month stay based on a decision that the relevant patents are invalid, unenforceable and/or not infringed, a court can also shorten or lengthen the 30-month stay under certain limited circumstances. The NCE exclusivity period for LINZESS expires on August 30, 2017, extending the 30-month stay for any ANDA that is the subject of a patent infringement suit filed by us before such expiration date to February 29, 2020 (absent any of the foregoing adjustments). In November 2016, we filed a patent infringement lawsuit against the companies making such ANDA filings. For additional information relating to such lawsuit, see Item 3, Legal Proceedings, elsewhere in this Annual Report on Form 10-K.

Additionally, the validity of the patents relating to our products and our product candidates may be challenged by third parties pursuant to administrative procedures introduced by the American Invents Act, specifically *inter partes* review, or IPR, and/or post grant review, or PGR, before the USPTO. Generic drug manufacturers may challenge our patents through IPRs or PGRs instead of or in addition to ANDA legal proceedings.

Patent litigation (including any lawsuits that we file against generic drug manufacturers in connection with the receipt of a Notice Letter), IPRs and PGRs involve complex legal and factual questions and we may need to devote significant resources to such legal proceedings. We can provide no assurance concerning the duration or the outcome of any such patent-related lawsuits or administrative proceedings. An adverse result in any litigation or defense proceedings could put one or more of the patents relating to our products and our product candidates at risk of being invalidated or interpreted narrowly, or could otherwise result in a loss of patent protection for the product or product candidate at issue, and could put our patent applications at risk of not issuing, which would materially harm our business. Upon any loss of patent protection for one of our products, or upon an "at-risk" launch (despite pending patent infringement litigation, before any court decision or while an appeal of a lower court decision is pending) by a manufacturer of a generic version of one of our patented products, our revenues for that product could be significantly reduced in a short period of time, which would materially and adversely affect our business.

Interference or derivation proceedings brought by the USPTO may be necessary to determine the priority of inventions with respect to the patents relating to our products and our product candidates and patent applications or those of our partners. An unfavorable outcome could require us to cease using the technology or to attempt to license rights to it from the prevailing party. Our business could be harmed if a prevailing party does not offer us a license on terms that are acceptable to us. Litigation or interference proceedings may fail and, even if successful, may result in substantial costs and distraction of our management and other employees. In addition, we may not be able to prevent, alone or with our partners, misappropriation of our proprietary rights, particularly in countries where the laws may not protect those rights as fully as in the U.S.

Furthermore, because of the substantial amount of discovery required in connection with intellectual property litigation, as well as the potential for public announcements of the results of hearings, motions or other interim proceeding or developments, there is a risk that some of our confidential information could be compromised by disclosure during this type of litigation.

Risks Related to Our Finances and Capital Requirements

We have incurred significant losses since our inception and cannot guarantee when, if ever, we will become profitable or attain positive cash flows.

In recent years, we have focused primarily on developing, manufacturing and commercializing linaclotide, as well as developing our other product candidates. We have financed our business to date primarily through the issuance

of equity, our collaboration and license arrangements, our January 2013 issuance of our 11% PhaRMA Notes due 2024, or the PhaRMA Notes, related to the sales of LINZESS in the U.S. (which were redeemed, in full, in connection with the funding and issuance in January 2017 of our 8.375% Notes due 2026, or the 2026 Notes) and our June 2015 issuance of our 2.25% Convertible Senior Notes due June 15, 2022, or the 2022 Notes, and we have incurred losses in each year since our inception in 1998. We currently derive substantially all of our revenue from our LINZESS collaboration with Allergan for the U.S. We believe that the revenues from the LINZESS collaboration will continue to constitute a significant portion of our total revenue for the foreseeable future. We incurred net losses of approximately $81.7 million, approximately $142.7 million and approximately $189.6 million in the years ended December 31, 2016, 2015 and 2014, respectively. As of December 31, 2016, we had an accumulated deficit of approximately $1.2 billion. We cannot be certain that sales of LINZESS and ZURAMPIC, and the revenue from our other commercial activities will not fall short of our projections or be delayed. Further, we expect to continue to incur substantial expenses in connection with our efforts to commercialize linaclotide and lesinurad, and research and develop our product candidates. Because of the numerous risks and uncertainties associated with developing and commercializing pharmaceutical products, as well as those related to our expectations for LINZESS and ZURAMPIC and our other commercial activities, we are unable to predict the extent of any future losses or guarantee when, or if, our company will become profitable or cash flow positive. If we never achieve profitability or positive cash flows, or achieve either later than we anticipate, this will have an adverse effect on our stockholders' equity and working capital.

We may need additional funding and may be unable to raise capital when needed, which could cause us to delay, reduce or eliminate our product development programs or commercialization efforts.

In January 2017, in connection with the redemption of our PhaRMA Notes, we issued $150.0 million aggregate principal amount of our 2026 Notes bearing an annual interest rate of 8.375%. In June 2015, we issued approximately $335.7 million aggregate principal amount of our 2022 Notes and we have previously raised additional funds through other capital raising activities, including the sale of shares of our Class A common stock in public offerings and the issuance of our PhaRMA Notes in January 2013 (which were redeemed, in full, in connection with the issuance of our 2026 Notes). However, marketing and selling primary care drugs, purchasing commercial quantities of pharmaceutical products, developing product candidates, conducting clinical trials and accessing externally developed products are expensive and uncertain. Circumstances, our strategic imperatives, or opportunities to create or acquire new programs, as well as maturities, redemptions or repurchases of our outstanding debt securities, could require us to, or we may choose to, seek to raise additional funds. The amount and timing of our future funding requirements will depend on many factors, including, but not limited to:

- the level of underlying demand for linaclotide by prescribers and patients in the U.S. and the other countries where it is approved and for ZURAMPIC by prescribers and patients in the U.S.;
- the costs associated with commercializing LINZESS and ZURAMPIC in the U.S.;
- the costs of establishing, maintaining and/or expanding sales, marketing, distribution, and market access capabilities for linaclotide and lesinurad;
- the regulatory approval of linaclotide outside of the U.S. and the other countries where it is approved and the timing of commercial launches in those countries, and the regulatory approval of linaclotide within new indications, populations and formulations, as well as the associated development and commercial milestones and royalties;
- the rate of progress, the cost of our clinical trials and the other costs associated with our linaclotide product development programs, including our post-approval nonclinical and clinical studies of linaclotide in pediatrics and our investment to enhance the clinical profile of LINZESS within IBS-C and CIC, as well as to study linaclotide in additional indications, populations and formulations to assess its potential to treat various GI conditions;
- the rate of progress and the costs associated with development of lesinurad, including costs for which we are required to reimburse AstraZeneca for conducting certain activities related to the post-marketing clinical trial for ZURAMPIC required by the FDA and many activities for DUZALLO, as well as for providing transition services;

- the costs and timing of in-licensing additional products or product candidates or acquiring other complementary companies;
- the achievement and timing of milestone payments and royalties due or payable under our collaboration and license agreements;
- the status, terms and timing of any collaboration, licensing, co-commercialization or other arrangements;
- the timing of any regulatory approvals of our product candidates;
- whether the holders of our 2022 Notes hold the notes to maturity without conversion into our Class A common stock and whether we are required to repurchase our 2022 Notes prior to maturity upon a fundamental change, as defined in the indenture governing the 2022 Notes; and
- whether we seek to redeem or repurchase all or part of our outstanding debt through cash purchases and/or exchanges, in open market purchases, privately negotiated transactions, by tender offer or otherwise.

Additional funding may not be available on acceptable terms or at all. If adequate funds are not available, we may be required to delay or reduce the scope of our commercialization efforts, delay, reduce or eliminate one or more of our development programs or delay or abandon potential strategic opportunities.

Our ability to pay principal of and interest on our outstanding debt securities will depend in part on the receipt of payments from Allergan under our collaboration agreement for North America.

In January 2017, we issued, in connection with the redemption of our PhaRMA Notes, $150.0 million aggregate principal amount of our 2026 Notes bearing an annual interest rate of 8.375% and in June 2015, we issued approximately $335.7 million aggregate principal amount of our 2022 Notes bearing an annual interest rate of 2.25%. Semi-annual payments on our 2022 Notes commenced on December 15, 2015. The indenture for our 2026 Notes provides for quarterly interest payments on such notes to commence on June 15, 2017 and, beginning in March 2019, for such quarterly payments to equal the greater of (i) 7.5% of net sales of linaclotide in the U.S. for the preceding quarter and (ii) the accrued and unpaid interest on the 2026 Notes. Principal on the 2026 Notes is to be repaid in an amount equal to the difference between (i) and (ii) above, when this is a positive number, until the principal has been paid in full. We expect that for the next few years, at a minimum, the net quarterly payments from Allergan will be a significant source of cash flow from operations. If the cash flows derived from the net quarterly payments that we receive from Allergan under the collaboration agreement for North America are insufficient on any particular payment date to fund the interest payment on our outstanding indebtedness, at a minimum, we will be obligated to pay the amounts of such shortfall out of our general funds. The determination of whether Allergan will be obligated to make a net quarterly payment to us in respect of a particular quarterly period is a function of the revenue generated by LINZESS in the U.S. as well as the development, manufacturing and commercialization expenses incurred by each of us and Allergan under the collaboration agreement for North America. Accordingly, since we cannot guarantee when, or if, our company will become profitable or cash flow positive, we cannot provide assurances that (i) we will have the available funds to fund the interest payment on our outstanding indebtedness, at a minimum, in the event that there is a deficiency in the net quarterly payment received from Allergan, (ii) there will be a net quarterly payment from Allergan at all or (iii) we will not also be required to make a true-up payment to Allergan under the collaboration agreement for North America, in each case, in respect of a particular quarterly period.

Our indebtedness could adversely affect our financial condition or restrict our future operations.

As of December 31, 2016, we had total indebtedness of approximately $470.0 million and available cash, cash equivalents and available for sale securities of approximately $305.2 million. We chose to issue our 2026 Notes (in connection with the redemption, in full, of our PhaRMA Notes) and our 2022 Notes based on the additional strategic optionality that they create for us, and the limited restrictions that these debt securities place on our ability to run our business compared to other potential available financing transactions. However, our indebtedness, combined with our other financial obligations and contractual commitments, could have other important consequences on our business, including:

- limiting our ability to obtain additional financing to fund future working capital, capital expenditures or other general corporate purposes, including product development, commercialization efforts, research and development activities, strategic arrangements, acquisitions and refinancing of our outstanding debt;
- requiring a substantial portion of our cash flow to be dedicated to debt service payments instead of other purposes, thereby reducing the amount of cash flow available for working capital, capital expenditures, corporate transactions and other general corporate purposes;
- increasing our vulnerability to adverse changes in general economic, industry and competitive conditions;
- limiting our flexibility in planning for and reacting to changes in the industry in which we compete;
- placing us at a disadvantage compared to other, less leveraged competitors or competitors with comparable debt at more favorable interest rates; and
- increasing our cost of borrowing.

If we do not generate sufficient cash flow from operations or if future borrowings are not available to us in an amount sufficient to pay our indebtedness, including payments of principal when due on our outstanding indebtedness or, in the case of our 2022 Notes, in connection with a transaction involving us that constitutes a fundamental change under the indenture governing the 2022 Notes, or to fund our liquidity needs, we may be forced to refinance all or a portion of our indebtedness on or before the maturity dates thereof, sell assets, reduce or delay currently planned activities or curtail operations, seek to raise additional capital or take other actions. We may not be able to execute any of these actions on commercially reasonable terms or at all. This, together with any of the factors described above, could materially and adversely affect our business, financial condition and results of operations.

In addition, while our 2022 Notes do not include covenants restricting the operation of our business except in certain limited circumstances, in the event of a default under the 2022 Notes, the noteholders or the trustee under the indenture governing the 2022 Notes may accelerate our payment obligations under the 2022 Notes, which could have a material adverse effect on our business, financial condition and results of operations. We are also required to offer to repurchase the 2022 Notes upon the occurrence of a fundamental change, which could include, among other things, any acquisition of our company (other than an acquisition in which at least 90% of the consideration is common stock listed on The NASDAQ Global or Global Select Market or The New York Stock Exchange), subject to the terms of the 2022 Notes indenture. The repurchase price must be paid in cash, and this obligation may have the effect of discouraging, delaying or preventing an acquisition of our company that would otherwise be beneficial to our security holders.

Further, although we are not as restricted under our 2026 Notes as we might have been under a more traditional secured credit facility provided by a bank, the indenture governing our 2026 Notes contains a number of restrictive covenants that impose restrictions on us and may limit our ability to engage in certain acts, including restrictions on our ability to:

- amend our collaboration agreement with Allergan for North America in a way that would have a material adverse effect on the noteholders' rights, or terminate this collaboration agreement with respect to the U.S.;
- transfer our rights to commercialize the product under our collaboration agreement with Allergan for North America; and
- incur certain liens.

Upon a breach of the covenants under our 2026 Notes indenture, or if certain other defaults thereunder occur, the holders of our 2026 Notes could elect to declare all amounts outstanding under our 2026 Notes to be immediately due and payable and we cannot be certain that we will have sufficient assets to repay them. If we are unable to repay those amounts, the holders of our 2026 Notes could proceed against the collateral granted to them to secure the debt securities and we could be forced into bankruptcy or liquidation. If we breach our covenants under our 2026 Notes indenture and seek a waiver, we may not be able to obtain a waiver from the required noteholders. If this occurs, we would be in default under our 2026 Notes indenture and the holders of our 2026 Notes could exercise their rights, as described above.

Each of our 2026 Notes and 2022 Notes also include cross-default features providing that a default under the indenture governing either the 2026 Notes or the 2022 Notes would likely result in a default under the indenture governing the other indebtedness. In the event of such default, the trustee or noteholders could elect to declare all amounts outstanding to be immediately due and payable under the applicable indenture, which could have a material adverse effect on our business, financial condition and results of operations.

Convertible note hedge and warrant transactions entered into in connection with our 2022 Notes may affect the value of our Class A common stock.

In connection with our 2022 Notes, we entered into Convertible Note Hedges and separate Note Hedge Warrant transactions with certain financial institutions. These transactions are expected generally to reduce the potential dilution upon any conversion of our 2022 Notes or offset any cash payments we are required to make in excess of the principal amount of converted 2022 Notes, as the case may be.

In connection with these transactions, the financial institutions purchased our Class A common stock in secondary market transactions and entered into various over-the-counter derivative transactions with respect to our Class A common stock. These entities or their affiliates are likely to modify their hedge positions from time to time prior to conversion or maturity of the 2022 Notes by purchasing and selling shares of our Class A common stock or other instruments they may wish to use in connection with such hedging. Any of these activities could adversely affect the value of our Class A common stock and, as a result, the number of shares and the value of the Class A common stock noteholders will receive upon conversion of the 2022 Notes. In addition, under certain circumstances the counterparties have the right to terminate the Convertible Note Hedges and settle the Note Hedge Warrants at fair value (as defined in the applicable confirmations), which may result in us not receiving all or any portion of the anticipated benefit of the Convertible Note Hedges. If the price of our Class A common stock increases such that the hedge transactions settle in our favor, we could also be exposed to credit risk related to the counterparties to the Convertible Note Hedges, which would limit or eliminate the benefit of such transactions to us.

Our quarterly and annual operating results may fluctuate significantly.

We expect our operating results to be subject to frequent fluctuations. Our net loss and other operating results will be affected by numerous factors, including:

- the level of underlying demand for linaclotide in the U.S. and the other countries where it is approved and for ZURAMPIC in the U.S.;
- wholesalers' buying patterns with respect to LINZESS and ZURAMPIC;
- the costs associated with commercializing LINZESS and ZURAMPIC in the U.S.;
- the achievement and timing of milestone payments and royalties due or payable under our collaboration and license agreements;
- our execution of any collaboration, partnership, licensing or other strategic arrangements, and the timing of payments we may make or receive under these arrangements;
- any excess or obsolete inventory or impairments of assets, including in-process research and development and other intangible assets, and associated write-downs;
- any changes in the fair value of contingent consideration and the associated impact on our statement of operations;

- any variations in the level of expenses related to our development programs;
- addition or termination of clinical trials;
- regulatory developments affecting our products and product candidates; and
- any material lawsuit in which we may become involved.

If our operating results fall below the expectations of investors or securities analysts, the price of our Class A common stock could decline substantially. Furthermore, any quarterly or annual fluctuations in our operating results may, in turn, cause the price of our stock to fluctuate substantially.

Our ability to use net operating loss and tax credit carryforwards and certain built-in losses to reduce future tax payments is limited by provisions of the Internal Revenue Code, and it is possible that our net operating loss and tax credit carryforwards may expire before we generate sufficient taxable income to use such carryforwards, or that certain transactions or a combination of certain transactions may result in material additional limitations on our ability to use our net operating loss and tax credit carryforwards.

We have incurred significant net losses since our inception and cannot guarantee when, if ever, we will become profitable. To the extent that we continue to generate federal and state taxable losses, unused net operating loss and tax credit carryforwards will carry forward to offset future taxable income, if any, until such unused carryforwards expire. Sections 382 and 383 of the Internal Revenue Code of 1986, as amended, contain rules that limit the ability of a company that undergoes an ownership change, which is generally any change in ownership of more than 50% of its stock over a three-year period, to utilize its net operating loss and tax credit carryforwards and certain built-in losses recognized in years after the ownership change. These rules generally operate by focusing on ownership changes involving stockholders owning directly or indirectly 5% or more of the stock of a company and any change in ownership arising from a new issuance of stock by the company. Generally, if an ownership change occurs, the yearly taxable income limitation on the use of net operating loss and tax credit carryforwards and certain built-in losses is equal to the product of the applicable long term tax exempt rate and the value of the company's stock immediately before the ownership change.

If we do not generate sufficient taxable income prior to the expiration of the applicable carryforwards or if the carryforwards are subject to the limitations described above, we may be unable to offset our taxable income with losses, or our tax liability with credits, before such losses and credits expire and therefore would incur larger federal or state income tax liability. We have completed several financings since our inception which may have resulted in a change in control as defined by Section 382, or could result in a change in control in the future.

Risks Relating to Securities Markets and Investment in Our Stock

Anti-takeover provisions under our charter documents and Delaware law could delay or prevent a change of control which could negatively impact the market price of our Class A common stock.

Provisions in our certificate of incorporation and bylaws may have the effect of delaying or preventing a change of control. These provisions include the following:

- Our certificate of incorporation provides for a dual class common stock structure. As a result of this structure, holders of our Class B common stock have significant influence over certain matters requiring stockholder approval, including a merger involving Ironwood, a sale of substantially all Ironwood assets and a dissolution or liquidation of Ironwood. This concentrated control could discourage others from initiating a change of control transaction that other stockholders may view as beneficial.
- Our board of directors is divided into three classes serving staggered three-year terms, such that not all members of the board are elected at one time. This staggered board structure prevents stockholders from replacing the entire board at a single stockholders' meeting.
- Our board of directors has the right to elect directors to fill a vacancy created by the expansion of the board of directors or the resignation, death or removal of a director, which prevents stockholders from being able to fill vacancies on our board of directors.

- Our board of directors may issue, without stockholder approval, shares of preferred stock. The ability to authorize preferred stock makes it possible for our board of directors to issue preferred stock with voting or other rights or preferences that could impede the success of any attempt to acquire us.

- Stockholders must provide advance notice to nominate individuals for election to the board of directors or to propose matters that can be acted upon at a stockholders' meeting. Furthermore, stockholders may only remove a member of our board of directors for cause. These provisions may discourage or deter a potential acquirer from conducting a solicitation of proxies to elect such acquirer's own slate of directors or otherwise attempting to obtain control of our company.

- Our stockholders may not act by written consent. As a result, a holder, or holders, controlling a majority of our capital stock are not able to take certain actions outside of a stockholders' meeting.

- Special meetings of stockholders may be called only by the chairman of our board of directors, our chief executive officer or a majority of our board of directors. As a result, a holder, or holders, controlling a majority of our capital stock are not able to call a special meeting.

- A majority of the outstanding shares of Class B common stock are required to amend our certificate of incorporation and a super-majority (80%) of the outstanding shares of common stock are required to amend our bylaws, which make it more difficult to change the provisions described above.

In addition, we are governed by the provisions of Section 203 of the Delaware General Corporation Law, which may prohibit certain business combinations with stockholders owning 15% or more of our outstanding voting stock. These and other provisions in our certificate of incorporation and our bylaws and in the Delaware General Corporation Law could make it more difficult for stockholders or potential acquirers to obtain control of our board of directors or initiate actions that are opposed by the then-current board of directors.

The concentration of voting control on certain corporate matters with our pre-IPO stockholders will limit the ability of the holders of our Class A common stock to influence such matters.

Because of our dual class common stock structure, the holders of our Class B common stock, who consist of our pre-IPO investors (and their affiliates), founders, directors, executives and certain of our employees, are able to control certain corporate matters listed below if any such matter is submitted to our stockholders for approval even though such stockholders own less than 50% of the outstanding shares of our common stock. As of December 31, 2016, there were 132,631,387 shares of our Class A common stock issued and outstanding, 14,784,077 shares of our Class B common stock issued, 14,484,077 shares of our Class B common stock outstanding, and an aggregate of 18,136,642 and 2,318,017 outstanding stock options (vested and unvested) and 1,299,457 and no unvested restricted stock units for shares of our Class A common stock and Class B common stock, respectively. As of December 31, 2016, the holders of our Class A common stock own approximately 90% and the holders of our Class B common stock own approximately 10% of the outstanding shares of Class A common stock and Class B common stock, combined. However, because of our dual class common stock structure these holders of our Class A common stock have approximately 48% and holders of our Class B common stock have approximately 52% of the total votes on each of the matters identified in the list below. This concentrated control of our Class B common stockholders limits the ability of the Class A common stockholders to influence those corporate matters and, as a result, we may take actions that many of our stockholders do not view as beneficial, which could adversely affect the market price of our Class A common stock.

Each share of Class A common stock and each share of Class B common stock has one vote per share on all matters except for the following matters, for which each share of our Class B common stock has ten votes per share and each share of our Class A common stock has one vote per share:

- adoption of a merger or consolidation agreement involving Ironwood;

- a sale of all or substantially all of Ironwood's assets;

- a dissolution or liquidation of Ironwood; and

- every matter, if and when any individual, entity or "group" (as that term is used in Regulation 13D of the Exchange Act) has, or has publicly disclosed (through a press release or a filing with the SEC) an intent to

have, beneficial ownership of 30% or more of the number of outstanding shares of Class A common stock and Class B common stock, combined.

If we identify a material weakness in our internal control over financial reporting, it could have an adverse effect on our business and financial results and our ability to meet our reporting obligations could be negatively affected, each of which could negatively affect the trading price of our Class A common stock.

A material weakness is a deficiency, or a combination of deficiencies, in internal control over financial reporting, such that there is a reasonable possibility that a material misstatement of our annual or interim financial statements will not be prevented or detected on a timely basis. Accordingly, a material weakness increases the risk that the financial information we report contains material errors.

We regularly review and update our internal controls, disclosure controls and procedures, and corporate governance policies. In addition, we are required under the Sarbanes-Oxley Act of 2002 to report annually on our internal control over financial reporting. Our system of internal controls, however well-designed and operated, is based in part on certain assumptions and includes elements that rely on information from third parties, including our partners. Our system can provide only reasonable, not absolute, assurances that the objectives of the system are met. If we, or our independent registered public accounting firm, determine that our internal controls over financial reporting are not effective, or we discover areas that need improvement in the future, these shortcomings could have an adverse effect on our business and financial results, and the price of our Class A common stock could be negatively affected.

Further, we are dependent on our partners for information related to our results of operations. Our net profit or net loss generated from the sales of LINZESS in the U.S. is partially determined based on amounts provided by Allergan and involves the use of estimates and judgments, which could be modified in the future. We are highly dependent on our linaclotide partners for timely and accurate information regarding any revenues realized from sales of linaclotide in their respective territories, and in the case of Allergan for the U.S. and AstraZeneca for China, Hong Kong and Macau, the costs incurred in developing and commercializing it in order to accurately report our results of operations. We are also dependent on AstraZeneca for timely and accurate information regarding any lesinurad expenses for which we are required to reimburse AstraZeneca and for certain finance and financial reporting services, in each case, until we are able to establish such capabilities or such activities are completed. Our results of operations are also dependent on the timeliness and accuracy of information from any other licensing, collaboration or other partners we may have, as well as our and our partners' use of estimates and judgments. If we do not receive timely and accurate information or if estimated activity levels associated with the relevant collaboration at a given point in time are incorrect, whether the result of a material weakness or not, we could be required to record adjustments in future periods. Such adjustments, if significant, could have an adverse effect on our financial results, which could lead to a decline in our Class A common stock price.

If we cannot conclude that we have effective internal control over our financial reporting, or if our independent registered public accounting firm is unable to provide an unqualified opinion regarding the effectiveness of our internal control over financial reporting, investors could lose confidence in the reliability of our financial statements, which could lead to a decline in our stock price. Failure to comply with reporting requirements could also subject us to sanctions and/or investigations by the SEC, The NASDAQ Stock Market or other regulatory authorities.

We expect that the price of our Class A common stock will fluctuate substantially.

The market price of our Class A common stock may be highly volatile due to many factors, including:

- the commercial performance of linaclotide in the U.S. and the other countries where it is approved and the commercial performance of ZURAMPIC in the U.S., as well as the costs associated with such activities;
- any third-party coverage and reimbursement policies for our products;
- market conditions in the pharmaceutical and biotechnology sectors;
- developments, litigation or public concern about the safety of our products or our potential products;
- announcements of the introduction of new products by us or our competitors;

- announcements concerning product development results, including clinical trial results, or intellectual property rights of us or others;
- actual and anticipated fluctuations in our quarterly and annual operating results;
- deviations in our operating results from any guidance we may provide or the estimates of securities analysts;
- sales of additional shares of our common stock or sales of securities convertible into common stock or the perception that these sales might occur;
- additions or departures of key personnel;
- developments concerning current or future collaboration, partnership, licensing or other strategic arrangements; and
- discussion of us or our stock price in the financial or scientific press or in online investor communities.

The realization of any of the risks described in these "Risk Factors" could have a dramatic and material adverse impact on the market price of our Class A common stock. In addition, class action litigation has often been instituted against companies whose securities have experienced periods of volatility. Any such litigation brought against us could result in substantial costs and a diversion of management attention, which could hurt our business, operating results and financial condition.

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

None.

Item 2. ***Properties***

Our corporate headquarters and operations are located in Cambridge, Massachusetts, where, as of December 31, 2016, we occupied approximately 219,000 square feet of office and laboratory space. We lease approximately 312,000 square feet of office and laboratory space at our Cambridge, Massachusetts facility under our lease expiring in January 2018. We also sublease approximately 93,000 square feet of our total leased space to a third party under a sublease which expires in 2018. We believe that our facilities are suitable and adequate for our needs for the foreseeable future.

Item 3. ***Legal Proceedings***

Actions in which we are the Plaintiff

LINZESS

In 2016, we and Allergan received Notice Letters regarding ANDAs submitted to the FDA by generic drug manufacturers requesting approval to engage in commercial manufacture, use, sale and offer for sale of linaclotide capsules (145 mcg and 290 mcg), or the Potential Generic Products, proposed generic versions of our FDA-approved drug LINZESS. In October 2016, we received a Notice Letter relating to an ANDA that was submitted to the FDA by Teva Pharmaceuticals USA, Inc., or Teva. Teva's Notice Letter contends that the United States patents for LINZESS (U.S. Patent Nos. 7,371,727, 7,704,947, 7,745,409, 8,080,526, and 8,110,553 (expiring 2024); 7,304,036 (expiring 2026); and 8,748,573, 8,802,628, and 8,933,030 (expiring 2031), or the Challenged Patents) listed in the FDA's list of Approved Drug Products with Therapeutic Equivalence Evaluations, commonly referred to as the Orange Book, are invalid, unenforceable and/or would not be infringed by Teva's manufacture, use, sale or offer for sale of the Potential Generic Products. Also in October 2016, we received a Notice Letter relating to an ANDA that was submitted to the FDA by Aurobindo Pharma Ltd., or Aurobindo. Aurobindo's Notice Letter contends that certain of the Challenged Patents (U.S. Patent Nos. 8,748,573, 8,802,628, and 8,933,030 (expiring 2031)) are invalid and/or would not be infringed by Aurobindo's manufacture, use, sale or offer for sale of the Potential Generic Products. In November 2016, we received a Notice Letter relating to an ANDA that was submitted to the FDA by Sandoz Inc., or Sandoz. Sandoz's Notice Letter contends that all of the Challenged Patents are invalid, unenforceable and/or would not be infringed by Sandoz's manufacture, use, sale or offer for sale of the Potential Generic Products. Also in November 2016, we received a Notice Letter relating to an ANDA that was submitted to the FDA by Mylan Pharmaceuticals Inc., or Mylan. Mylan's

Notice Letter contends that all of the Challenged Patents are invalid, unenforceable and/or would not be infringed by Mylan's manufacture, use, sale or offer for sale of the Potential Generic Products.

In response to the four ANDAs received in 2016, we and Allergan filed a lawsuit against these generic drug manufacturers, or the ANDA Filers, in Delaware District Court in November 2016. We asserted that the Challenged Patents are valid and infringed by Teva, Sandoz and Mylan, and that U.S. Patent No. 8,933,030 is valid and infringed by Aurobindo. In accordance with the Hatch-Waxman Act, the timely filing of the lawsuit against the ANDA Filers triggered an automatic stay of the FDA's approval of the four ANDAs until February 29, 2020 (unless there is a final court decision adverse to us and Allergan sooner). Mylan responded in December 2016, asserting defenses of, among other things, lack of subject matter and personal jurisdiction and improper venue. In January 2017, each of Teva and Sandoz filed an answer and counterclaims seeking declaratory judgment of invalidity and non-infringement of the Challenged Patents.

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***

Shares of our Class A common stock are traded on the NASDAQ Global Select Market under the symbol "IRWD." Our shares have been publicly traded since February 3, 2010. The following table furnishes the high and low sales prices for our Class A common stock as reported by The NASDAQ Global Select Market for each quarter in the years ended December 31, 2016 and 2015:

	Class A Common Stock			
	2016		2015	
	High	Low	High	Low
First Quarter	$ 11.54	$ 7.35	$ 17.11	$ 14.18
Second Quarter	$ 13.27	$ 9.06	$ 16.17	$ 11.57
Third Quarter	$ 16.17	$ 12.18	$ 12.36	$ 9.77
Fourth Quarter	$ 16.89	$ 12.48	$ 12.62	$ 10.05

As of February 15, 2017, there were 48 stockholders of record of our Class A common stock and 66 stockholders of record of our Class B common stock. The number of record holders is based upon the actual number of holders registered on the books of the company at such date and does not include holders of shares in "street names" or persons, partnerships, associations, corporations or other entities identified in security position listings maintained by depositories.

Subject to preferences that may apply to any shares of preferred stock outstanding at the time, the holders of Class A common stock and Class B common stock are entitled to share equally in any dividends that our board of directors may determine to issue from time to time. In the event a dividend is paid in the form of shares of common stock or rights to acquire shares of common stock, the holders of Class A common stock will receive Class A common stock, or rights to acquire Class A common stock, as the case may be, and the holders of Class B common stock will receive Class B common stock, or rights to acquire Class B common stock, as the case may be.

We have never declared or paid any cash dividends on our capital stock, and we do not currently anticipate declaring or paying cash dividends on our capital stock in the foreseeable future. We currently intend to retain all of our future earnings, if any, to finance operations. Any future determination relating to our dividend policy will be made at the discretion of our board of directors and will depend on a number of factors, including future earnings, capital requirements, financial conditions, future prospects, contractual restrictions and covenants and other factors that our board of directors may deem relevant.

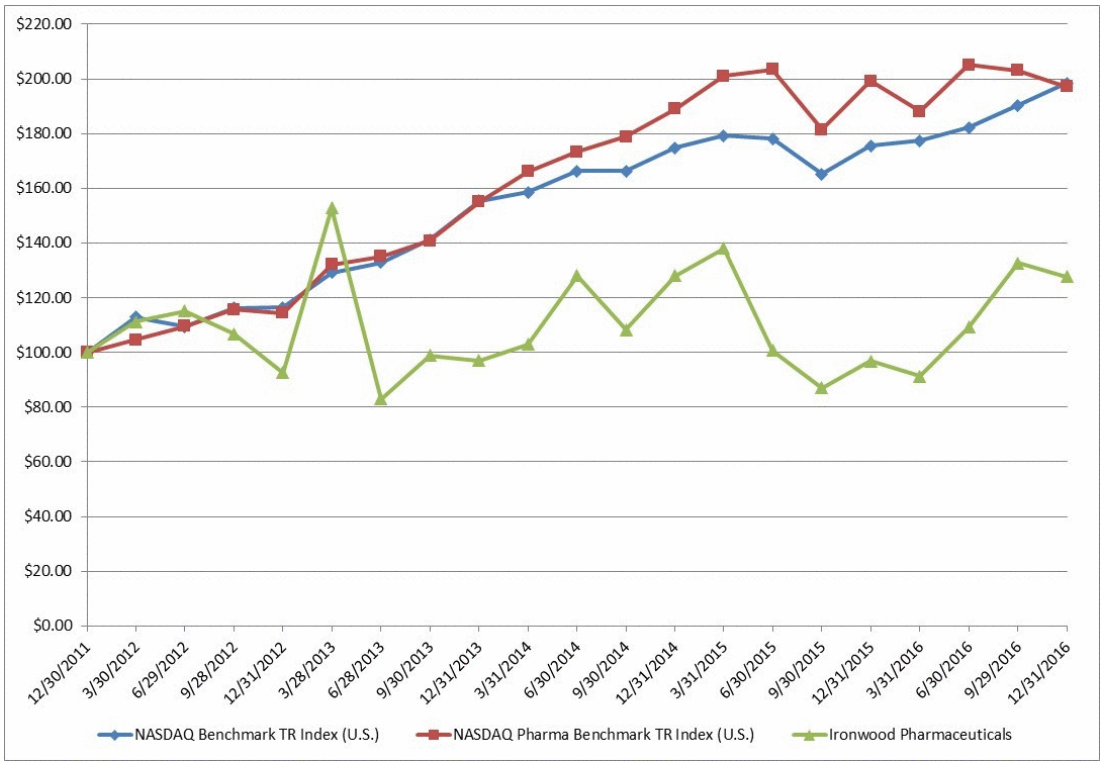
The information required to be disclosed by Item 201(d) of Regulation S-K, "Securities Authorized for Issuance Under Equity Compensation Plans," is referenced under Item 12 of Part III of this Annual Report on Form 10-K.

Corporate Performance Graph

The following performance graph and related information shall not be deemed to be "soliciting material" or to be "filed" with the SEC, nor shall such information be incorporated by reference into any future filing under the Securities Act of 1933, as amended, or the Securities Act, except to the extent that we specifically incorporate it by reference into such filing.

The following graph compares the performance of our Class A common stock to the NASDAQ Benchmark TR Index (U.S.) and to the NASDAQ Pharmaceutical Benchmark TR Index (U.S.) from December 30, 2011 through December 31, 2016. The comparison assumes $100 was invested after the market closed on December 30, 2011 in our Class A common stock and in each of the presented indices, and it assumes reinvestment of dividends, if any.

COMPARISON OF QUARTERLY CUMULATIVE TOTAL RETURN
Among The NASDAQ Benchmark TR Index (U.S.),
the NASDAQ Pharmaceutical Benchmark TR Index (U.S.)
and Ironwood Pharmaceuticals, Inc.



Item 6. ***Selected Consolidated Financial Data***

You should read the following selected financial data together with our consolidated financial statements and the related notes appearing elsewhere in this Annual Report on Form 10-K. We have derived the consolidated statements of operations data for the years ended December 31, 2016, 2015 and 2014 and the consolidated balance sheet data as of December 31, 2016 and 2015 from our audited financial statements included elsewhere in this Annual Report on Form 10-K. We have derived the consolidated statements of operations data for the years ended December 31, 2013 and 2012 and the consolidated balance sheet data as of December 31, 2014, 2013 and 2012 from our audited financial statements not included in this Annual Report on Form 10-K. Our historical results for any prior period are not necessarily indicative of results to be expected in any future period.

	Year Ended December 31,				
	2016	2015	2014	2013	2012
	(in thousands, except per share data)				
Consolidated Statement of Operations Data:					
Collaborative arrangements revenue[1]	$273,957	$ 149,555	$ 76,436	$ 22,881	$150,245
Cost and expenses:					
Cost of revenues	1,868	12	5,291	7,203	965
Write-down of inventory to net realizable value and loss on non-cancellable purchase commitments [2]	374	17,638	20,292	—	—
Research and development[3]	139,492	108,746	101,890	102,378	113,474
Selling, general and administrative[3]	173,281	125,247	118,333	123,228	92,538
Collaboration expense	—	—	—	42,074	16,030
Amortization of acquired intangible asset[4]	981	—	—	—	—
Loss on fair value remeasurement of contingent consideration[5]	9,831	—	—	—	—
Total cost and expenses	325,827	251,643	245,806	274,883	223,007
Loss from operations	(51,870)	(102,088)	(169,370)	(252,002)	(72,762)
Other (expense) income:					
Interest expense	(39,153)	(31,096)	(21,166)	(21,002)	(59)
Interest and investment income	1,169	443	257	192	197
Gain (loss) on derivatives[6]	8,146	(9,928)	—	—	—
Other income	—	—	661	—	—
Other (expense) income, net	(29,838)	(40,581)	(20,248)	(20,810)	138
Net loss	$ (81,708)	$(142,669)	$(189,618)	$(272,812)	$ (72,624)
Net loss per share—basic and diluted	$ (0.56)	$ (1.00)	$ (1.39)	$ (2.35)	$ (0.68)
Weighted average number of common shares used in net loss per share—basic and diluted:	144,928	142,155	136,811	115,852	106,403

(1) Collaborative arrangements revenue for the year ended December 31, 2016 included approximately $217.7 million related to our share of net profits from sales of LINZESS in the U.S. and $30.0 million related to the receipt of milestone payments under our license agreement with Astellas for the filing and approval of a new drug application for LINZESS with the Japanese Ministry of Health, Labor and Welfare. Additionally, we recognized an insignificant amount of product revenue for the year ended December 31, 2016 related to the sales of ZURAMPIC in the U.S. after the launch of the product in October 2016 was included within total collaborative arrangements revenue.

Collaborative arrangements revenue for the year ended December 31, 2014 includes approximately $10.2 million related to the receipt of a milestone payment under our license agreement with Astellas for the enrollment of the first study subject in a Phase III study for linaclotide in Japan, which was achieved in November 2014, and also includes approximately $1.9 million in payments from Almirall related to the achievement of two commercial milestones under the license agreement with Almirall.

Collaborative arrangements revenue for the year ended December 31, 2013 includes approximately $1.9 million in payments from Almirall related to the achievement of two milestones under the license agreement with Almirall.

Collaborative arrangements revenue for the year ended December 31, 2012 includes an $85.0 million milestone payment received from Allergan under the collaboration agreement for North America for the achievement of two development milestones upon the FDA's approval of the linaclotide NDA for both IBS-C and CIC.

(2) During the year ended December 31, 2015, we recorded expenses of approximately $17.6 million for the write-down of inventory and an accrual for excess non-cancelable inventory purchase commitments related to linaclotide API. These charges primarily related to a reduction in the near term demand forecast for CONSTELLA in the European territory by Almirall, our former European partner; regulatory changes made by the China Food and Drug Administration to the marketing approval process in China; and the amendment to the license agreement with Allergan pertaining to the development and commercialization of linaclotide for Europe executed in October 2015. Pursuant to the terms of the amendment, Allergan assumed responsibility for the manufacturing of linaclotide API for Europe, as well as the associated costs, which resulted in accruing for a loss on non-cancelable inventory purchase commitments under one of our API supply agreements covering the commercial supply of linaclotide API for the European market.

During the year ended December 31, 2014, we recorded approximately $20.3 million as a write-down of inventory to an estimated net realizable value of approximately $5.0 million. This write-down was primarily attributable to Almirall's reduced inventory demand forecasts for the European territory, mainly due to the suspension of commercialization of CONSTELLA in Germany and a challenging commercial environment throughout Europe.

These charges are more fully described in Note 8, *Inventory*, to our consolidated financial statements appearing elsewhere in this Annual Report on Form 10-K.

(3) During the year ended December 31, 2014, we recorded approximately $4.2 million of costs related to a reduction in workforce in the three months ended March 31, 2014, including employee severance, benefits and related costs and adjustments. These costs are reflected in our Consolidated Statement of Operations for the year ended December 31, 2014 as approximately $3.0 million in research and development expenses and approximately $1.2 million in selling, general and administrative expenses.

(4) Amortization of acquired intangible asset is based on the economic consumption of intangible assets. Our amortization is related to the ZURAMPIC intangible asset, which is amortized on a straight-line basis over the estimated useful life.

(5) Loss on fair value remeasurement of contingent consideration is related to our contingent consideration pursuant to our exclusive license to develop, manufacture, and commercialize products containing lesinurad as an active ingredient, including ZURAMPIC, in the U.S. The contingent consideration obligation is revalued at each reporting period and changes in the fair value, other than changes due to payments, are recognized as a (gain)/loss on fair value remeasurement of contingent consideration in our statement of operations.

(6) Gain (loss) on derivatives consists of the change in fair value of our Convertible Note Hedges and Note Hedge Warrants, which are recorded as derivative assets and liabilities. The Convertible Note Hedges and the Note Hedge Warrants are recorded at fair value at each reporting period and changes in fair value are recorded in our consolidated statements of operations. The Convertible Note Hedges and Note Hedge Warrants are more fully

described in Note 6, *Fair Value of Financial Instruments*, and Note 11, *Notes Payable*, to our consolidated financial statements appearing elsewhere in this Annual Report on Form 10-K.

	Year Ended December 31,				
	2016	2015	2014	2013	2012
	(in thousands)				
Consolidated Balance Sheet Data:					
Cash, cash equivalents and available-for-sale securities	$ 305,216	$ 439,394	$ 248,334	$ 197,602	$ 168,228
Working capital (excluding deferred revenue)	289,050	430,931	234,957	191,636	132,883
Total assets	709,821	619,121	329,322	273,292	229,907
Deferred revenue, including current portion	—	8,989	16,180	16,490	21,405
Debt financing and convertible notes, including current portion [(1)]	366,492	378,548	169,405	169,002	—
Capital lease obligations, including current portion	6,309	2,937	3,723	4,273	569
Total liabilities	643,105	523,996	240,770	235,067	85,855
Total stockholders' equity	66,716	95,125	88,552	38,225	144,052

(1) Debt financing and convertible notes, including current portion, as of December 31, 2016 includes approximately $132.2 relating to the PhaRMA Notes, which were redeemed, in full, in connection with the funding and issuance in January 2017 of the 8.375% notes due 2026, or the 2026 Notes, and approximately $234.2 relating to the convertible notes.

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

The following discussion of our financial condition and results of operations should be read in conjunction with our consolidated financial statements and the notes to those financial statements appearing elsewhere in this Annual Report on Form 10-K. This discussion contains forward-looking statements that involve significant risks and uncertainties. As a result of many factors, such as those set forth under "Risk Factors" in Item 1A of this Annual Report on Form 10-K, our actual results may differ materially from those anticipated in these forward-looking statements.

Overview

We are a commercial biotechnology company leveraging our proven development and commercial capabilities as we seek to bring multiple medicines to patients. We are advancing innovative product opportunities in areas of large unmet need, including irritable bowel syndrome with constipation, or IBS-C, and chronic idiopathic constipation, or CIC, hyperuricemia associated with uncontrolled gout, uncontrolled gastroesophageal reflux disease, or uncontrolled GERD, and vascular and fibrotic diseases.

Our first commercial product, linaclotide, is available to adult men and women suffering from IBS-C or CIC in the United States, or the U.S., under the trademarked name LINZESS®, and is available to adult men and women suffering from IBS-C in certain European countries under the trademarked name CONSTELLA®. We and our U.S. partner Allergan plc (together with its affiliates), or Allergan, began commercializing LINZESS in the U.S. in December 2012. Under our collaboration with Allergan for North America, total net sales of LINZESS in the U.S., as recorded by Allergan, are reduced by commercial costs incurred by each party, and the resulting amount is shared equally between us and Allergan. Our former European partner, Almirall, S.A., or Almirall, began commercializing CONSTELLA in Europe for the symptomatic treatment of moderate to severe IBS-C in adults in the second quarter of 2013. In October 2015, Almirall transferred its exclusive license to develop and commercialize linaclotide in Europe to Allergan, and we and Allergan entered into an amendment to the European license agreement. Currently, CONSTELLA is commercially available in a number of European countries, including the United Kingdom, Italy and Spain. In January 2017, we and Allergan entered into an amendment to the European license agreement, pursuant to which the license granted to Allergan was extended to a territory consisting of all countries worldwide not previously covered by the European license agreement, other than China, Hong Kong, Macau, Japan, and the countries and territories of North America. On a country-by-country and product-by-product basis in such additional territory, Allergan will pay us an annual royalty as a percentage of net sales of products containing linaclotide as an active ingredient. This agreement is more fully described in Note 20, *Subsequent Events*, to our consolidated financial statements appearing elsewhere in this Annual Report on Form 10-K.

In December 2013 and February 2014, linaclotide was approved in Canada and Mexico, respectively, as a treatment for adult men and women suffering from IBS-C or CIC. Allergan has exclusive rights to commercialize linaclotide in Canada as CONSTELLA and in Mexico as LINZESS. In May 2014, CONSTELLA became commercially available in Canada and in June 2014, LINZESS became commercially available in Mexico.

Astellas Pharma Inc., or Astellas, our partner in Japan, is developing linaclotide for the treatment of patients with IBS-C, chronic constipation, and other gastrointestinal, or GI, conditions in its territory. In December 2016, the Japanese Ministry of Health, Labor and Welfare approved LINZESS for the treatment of adults with IBS-C in Japan. In October 2012, we entered into a collaboration agreement with AstraZeneca AB (together with its affiliates), or AstraZeneca, to co-develop and co-commercialize linaclotide in China, Hong Kong and Macau, with AstraZeneca having primary responsibility for the local operational execution. In December 2015, we and AstraZeneca filed for approval with the China Food and Drug Administration, or CFDA, to market linaclotide in China.

We and Allergan are also advancing two linaclotide colonic release formulations. Linaclotide colonic release-1, or CR1, is a second-generation product candidate with the potential to improve abdominal pain relief in adult IBS-C patients. Linaclotide colonic release-2, or CR2, is a product candidate with the potential to improve abdominal pain in patients with additional GI disorders where lower abdominal pain is a predominant symptom such as non-constipation subtypes of IBS. Further, we and Allergan are exploring ways to enhance the clinical profile of LINZESS by studying linaclotide in additional indications and populations to assess its potential to treat various GI conditions. Linaclotide is being developed and commercialized in other parts of the world by certain of our partners. In December 2016, we and Allergan reported positive top-line data from a Phase IIb clinical trial evaluating linaclotide CR1 in adult IBS-C patients. The data from this study demonstrate numerically greater abdominal pain improvement with linaclotide CR1 300 mcg compared to placebo and to the 290 mcg immediate release formulation of linaclotide. We believe the data support advancement into a Phase III clinical trial in adult IBS-C patients. Also in December 2016, we and Allergan reported positive top-line data from a Phase IIb clinical trial evaluating linaclotide CR2 in IBS-C patients. The data from this study demonstrate numerically improved abdominal pain and other abdominal symptoms relative to placebo, as intended, with no apparent effect on bowel movement function. We believe the data support further investigation of linaclotide CR2 in additional GI indications associated with abdominal pain, including non-constipation subtypes of IBS.

We are also advancing IW-3718, a gastric retentive formulation of a bile acid sequestrant with the potential to provide symptomatic relief in patients with uncontrolled GERD.

In April 2016, we discontinued development of IW-9179 for gastroparesis, as top-line data from our exploratory Phase IIa clinical study indicated that IW-9179 did not meaningfully reduce the severity of symptoms in patients with diabetic gastroparesis. In July 2016, we also discontinued advancing IW-9179 for the treatment of functional dyspepsia and are no longer advancing the program.

In June 2016, we closed a transaction with AstraZeneca, or the Lesinurad Transaction, pursuant to which we received an exclusive license to develop, manufacture, and commercialize in the U.S. products containing lesinurad as an active ingredient, or the Lesinurad License, including ZURAMPIC® and DUZALLO™. Lesinurad 200mg tablets were approved as ZURAMPIC by the U.S. Food and Drug Organization, or FDA, in December 2015 for use in combination with a xanthine oxidase inhibitor, or XOI, for the treatment of hyperuricemia associated with uncontrolled gout. In October 2016, ZURAMPIC became commercially available in the U.S. We are developing DUZALLO, a fixed-dose combination product of lesinurad and allopurinol, an XOI, which is included under the Lesinurad License. In January 2017, the FDA accepted for review a new drug application, or NDA, for DUZALLO for the treatment of hyperuricemia in patients with uncontrolled gout. We have accounted for the Lesinurad Transaction in accordance with Accounting Standards Codification, or ASC, Topic 805, *Business Combinations*, or ASC 805, as the Lesinurad Transaction meets the requirements of a business combination. The transaction is more fully described in Note 4, *Business Combinations*, to our consolidated financial statements appearing elsewhere in this Annual Report on Form 10-K.

We are also leveraging our pharmacological expertise in guanylate cyclase, or GC, pathways gained through the discovery and development of linaclotide to advance development programs, including IW-1973 and IW-1701, targeting soluble guanylate cyclase, or sGC. sGC is a validated mechanism with the potential for broad therapeutic utility and multiple opportunities for product development in vascular and fibrotic diseases, as well as other therapeutic areas.

As part of our strategy, we have also established development and commercial capabilities that we plan to leverage as we seek to bring multiple medicines to patients. We intend to play an active role in the development and

commercialization of our products in the U.S., and to establish a strong global brand by out-licensing commercialization rights in other territories to high-performing partners.

We and Exact Sciences Corp., or Exact Sciences, entered into an agreement, or the Cologuard Co-Promotion Agreement, to co-promote Cologuard®, the first and only FDA-approved noninvasive stool DNA screening test for colorectal cancer in March 2015. We and Exact Sciences co-promoted Cologuard through July 2016 and the Cologuard Co-Promotion Agreement was terminated in August 2016. Under the terms of the Cologuard Co-Promotion Agreement, our sales team promoted and educated health care practitioners regarding Cologuard. Exact Sciences maintained responsibility for all other aspects of the commercialization of Cologuard outside of the co-promotion. We are compensated primarily via royalties earned on the net sales of Cologuard generated from the healthcare practitioners on whom we called. Under the terms of the Cologuard Co-Promotion Agreement, we will continue to receive royalty payments through July 2017.

In August 2015, we and Allergan entered into an agreement for the co-promotion of VIBERZI™ (eluxadoline) in the U.S., Allergan's treatment for adults suffering from IBS with diarrhea, or IBS-D. Under the terms of the agreement, our clinical sales specialists are detailing VIBERZI to the approximately 25,000 health care practitioners to whom they detail LINZESS. Allergan is responsible for all costs and activities relating to the commercialization of VIBERZI outside the co-promotion. Our promotional efforts are compensated based on the volume of calls delivered by our sales force, with the terms of the agreement reducing or eliminating certain of the unfavorable adjustments to the share of net profits stipulated by the linaclotide collaboration agreement with Allergan for North America, provided that we deliver a minimum number of VIBERZI calls on physicians. We are also compensated via reimbursement for medical education initiatives.

In January 2017, we and Allergan entered into a commercial agreement under which the adjustments to our or Allergan's share of the net profits under the share adjustment provision of the collaboration agreement for linaclotide in North America are eliminated, in full, in 2018 and all subsequent years. This agreement is more fully described in Note 20, *Subsequent Events*, to our consolidated financial statements appearing elsewhere in this Annual Report on Form 10-K.

In June 2015, we issued approximately $335.7 million in aggregate principal amount of 2.25% Convertible Senior Notes due 2022, or the 2022 Notes. We received net proceeds of approximately $324.0 million from the sale of the 2022 Notes, after deducting fees and expenses of approximately $11.7 million. The net proceeds from these financings are being used to support the commercialization of LINZESS and ZURAMPIC in the U.S. and to fund linaclotide, lesinurad and other development opportunities to advance our strategy to grow a leading commercial biotechnology company, in addition to other general corporate purposes. In September 2016, we closed a direct private placement, pursuant to which we subsequently issued $150.0 million in aggregate principal amount of 8.375% notes due 2026, or the 2026 Notes, on January 5, 2017, or the Funding Date. The proceeds from the issuance of the 2026 Notes were used to redeem the outstanding principal balance of the 11% PhaRMA Notes due 2024, or the PhaRMA Notes, on the Funding Date. These transactions are more fully described in Note 11, *Notes Payable,* and Note 20, *Subsequent Events,* to our consolidated financial statements appearing elsewhere in this Annual Report on Form 10-K.

We were incorporated in Delaware on January 5, 1998 as Microbia, Inc. On April 7, 2008, we changed our name to Ironwood Pharmaceuticals, Inc. We operate in one reportable business segment—human therapeutics.

To date, we have dedicated a majority of our activities to the research, development and commercialization of linaclotide, as well as to the research and development of our other product candidates. We have incurred significant operating losses since our inception in 1998. As of December 31, 2016, we had an accumulated deficit of approximately $1.2 billion. We are unable to predict the extent of any future losses or guarantee when, or if, our company will become cash flow positive.

Financial Overview

Revenue. Revenue to date has been generated primarily through our collaboration agreements for the development and commercialization of linaclotide with Allergan for North America and AstraZeneca for China, Hong Kong and Macau, our license agreements for the development and commercialization of linaclotide in Japan with Astellas and the development and commercialization of linaclotide in Europe with Allergan (formerly with Almirall), and our co-promotion agreements with Allergan for VIBERZI and Exact Sciences for Cologuard in the U.S. The terms

of these agreements contain multiple deliverables which may include (i) licenses, (ii) research and development activities, (iii) the manufacture of finished drug product, active pharmaceutical ingredient, or API, or development materials for a partner which are reimbursed at a contractually determined rate, and (iv) co-promotion activities by our clinical sales specialists. Payments to us may include (i) up-front license fees, (ii) payments for research and development activities, (iii) payments for the manufacture of finished drug product, API or development materials, (iv) payments based upon the achievement of certain milestones, (v) payments for sales detailing, promotional support services and medical education initiatives and (vi) royalties on product sales. Additionally, we receive our share of the net profits or bear our share of the net losses from the sale of linaclotide in the U.S. and China. LINZESS launched in the U.S. in December 2012 and CONSTELLA became commercially available in certain European countries beginning in the second quarter of 2013. Linaclotide is also approved in a number of other countries.

We record our share of the net profits and losses from the sales of LINZESS in the U.S. on a net basis and present the settlement payments to and from Allergan as collaboration expense or collaborative arrangements revenue, as applicable. Net profits or losses consist of net sales to third-party customers and sublicense income in the U.S. less the cost of goods sold as well as selling, general and administrative expenses. Although we expect net sales to increase over time, the settlement payments between Allergan and us, resulting in collaborative arrangements revenue or collaboration expense, are subject to fluctuation based on the ratio of selling, general and administrative expenses incurred by each party. In addition, our collaborative arrangements revenue may fluctuate as a result of the timing and amount of license fees and clinical and commercial milestones received and recognized under our current and future strategic partnerships as well as timing and amount of royalties from the sales of linaclotide in the European, Canadian or Mexican markets or any other markets where linaclotide receives approval.

In June 2016, we closed the Lesinurad Transaction with AstraZeneca pursuant to which we received an exclusive license to develop, manufacture, and commercialize products containing lesinurad as an active ingredient, including ZURAMPIC, in the U.S. Beginning in October 2016, ZURAMPIC became commercially available in the U.S. We record product revenue related to the sales of ZURAMPIC in the U.S. in accordance with ASC 605, *Revenue Recognition*, or ASC 605, when persuasive evidence of an arrangement exists, delivery has occurred and title of the product and associated risk of loss has passed to the customer, the price is fixed or determinable and collection from the customer has been reasonably assured. ZURAMPIC product revenue is more fully described in Note 2, *Summary of Significant Accounting Policies.*

Cost of Revenues. Cost of revenues includes cost of collaborative arrangements revenue related to the sales of linaclotide API, as well as the cost of product revenue related to sales of ZURAMPIC in the U.S. Cost of collaborative arrangements revenue related to the sales of linaclotide API is recognized upon shipment of linaclotide API to certain of our partners outside of the U.S. Our cost of collaborative arrangements revenue for linaclotide consists of the internal and external costs of producing such API. Cost of product revenue related to the sales of ZURAMPIC in the U.S. includes the cost of producing finished goods that correspond with product revenue for the reporting period, as well as certain period costs related to freight, packaging, stability and quality testing, and customer acquisition.

Write-down of Inventory to Net Realizable Value and Loss on Non-cancelable Inventory Purchase Commitments. During the year ended December 31, 2016, we wrote-down approximately $0.4 million of prepaid ZURAMPIC commercial supply as result of revised demand forecasts.

During the year ended December 31, 2015, we recorded expenses of approximately $17.6 million for the write-down of inventory and an accrual for excess non-cancelable inventory purchase commitments related to linaclotide API. These charges primarily related to a reduction in the near term demand forecast for CONSTELLA in the European territory by Almirall; regulatory changes made by the CFDA to the marketing approval process in China; and the amendment to the license agreement with Allergan pertaining to the development and commercialization of linaclotide for Europe executed in October 2015. Pursuant to the terms of the amendment, Allergan assumed responsibility for the manufacturing of linaclotide API for Europe, as well as the associated costs, which resulted in accruing for a loss on non-cancelable inventory purchase commitments during the three months ended September 30, 2015, under one of our API supply agreements covering the commercial supply of linaclotide API for the European market. We have evaluated all remaining minimum purchase commitments under our linaclotide API supply agreements through 2023 and concluded that the approximately $20.1 million of purchase commitments from the second API supply agreement covering the Japan, China, Hong Kong and Macau markets are realizable based on the current forecasts received from our partners in these territories and our internal forecasts, as well as purchase orders received from our partners for the coming year.

During the year ended December 31, 2014, we wrote down approximately $20.3 million in inventory to an estimated net realizable value of approximately $5.0 million. This write down was primarily attributable to Almirall's reduced inventory demand forecasts, mainly due to the suspension of commercialization of CONSTELLA in Germany and a challenging commercial environment throughout Europe.

These charges are more fully described in Note 8, *Inventory,* and Note 12, *Commitments and Contingencies* to our consolidated financial statements appearing elsewhere in this Annual Report on Form 10-K.

Research and Development Expense. Research and development expense consists of expenses incurred in connection with the discovery and development of our product candidates. These expenses consist primarily of compensation, benefits and other employee-related expenses, research and development related facility costs, third-party contract costs relating to nonclinical study and clinical trial activities, development of manufacturing processes, regulatory registration of third-party manufacturing facilities, as well as licensing fees for our product candidates. We charge all research and development expenses to operations as incurred. Under our linaclotide collaboration agreements with Allergan for the U.S. and AstraZeneca for China, Hong Kong and Macau, we are reimbursed for certain research and development expenses, and we net these reimbursements against our research and development expenses as incurred. Amounts owed to Allergan or AstraZeneca for such linaclotide territories are recorded as incremental research and development expense.

The core of our research and development strategy is to leverage our development capabilities, as well as our pharmacologic expertise, to bring multiple medicines to patients. We are advancing innovative product opportunities in areas of large unmet need, including IBS-C and CIC, hyperuricemia associated with uncontrolled gout, uncontrolled GERD, and vascular and fibrotic diseases.

Linaclotide. Linaclotide is the first FDA-approved guanylate cyclase type-C, or GC-C, agonist. Linaclotide is approved in the U.S., Japan and in a number of E.U. and other countries.

We and Allergan are exploring development opportunities in the U.S. to enhance the clinical profile of LINZESS by studying linaclotide in additional indications, populations and formulations to assess its potential to treat various GI conditions. In January 2017, the FDA approved a 72 mcg dose of linaclotide for adults with CIC. The 72 mcg dose would provide a broader range of treatment options to physicians and adult CIC patients in the U.S.

Our linaclotide development opportunities also include linaclotide colonic release, a targeted oral delivery formulation of linaclotide designed to potentially improve abdominal pain relief in adult IBS-C patients, as well as in patients with additional GI disorders where lower abdominal pain is a predominant symptom, such as IBS-M, ulcerative colitis and diverticulitis, among others. Additionally, we and Allergan are evaluating linaclotide as a potential treatment of the GI dysfunction associated with opioid-induced constipation, or OIC, in adult patients and have established a plan with the FDA for clinical pediatric studies with linaclotide, as described below.

Lesinurad. The FDA has required a post-marketing clinical study to further evaluate the renal and cardiovascular safety of lesinurad, and has required that enrollment include patients with moderate renal impairment. Pursuant to the terms of the Lesinurad License, AstraZeneca is obligated to undertake certain activities related to this post-marketing clinical study and we are obligated to reimburse AstraZeneca up to $100.0 million over up to ten years for completion of such activities. In January 2017, the FDA accepted for review the NDA for DUZALLO. We and AstraZeneca, on our behalf, are undertaking additional development activities related to lesinurad.

Development Candidates. We are advancing our uncontrolled GERD program through the development of IW-3718, a gastric retentive formulation of a bile acid sequestrant.

Within our vascular/fibrotic program, we are leveraging our pharmacological expertise in GC pathways gained through the discovery and development of linaclotide to advance development programs targeting sGC. We are currently progressing two sGC development candidates in clinical development, IW-1973 and IW-1701, which have distinct pharmacologic profiles that we believe may be differentiating and enable opportunities in multiple indications.

We have additional assets in early development that we continue to advance, and we are exploring strategic options for further development of these assets.

Discovery Research. Our discovery efforts are primarily focused on identifying novel clinical candidates that draw on our proprietary and expanding expertise in GI disorders and GC.

The following table sets forth our research and development expenses related to our product pipeline for the years ended December 31, 2016, 2015 and 2014. These expenses relate primarily to external costs associated with nonclinical studies and clinical trial costs, costs incurred to develop manufacturing processes and register manufacturing facilities with the FDA and licensing fees for our product candidates. We allocate costs related to facilities, depreciation, share-based compensation, research and development support services, laboratory supplies and certain other costs directly to programs.

	Year Ended December 31,		
	2016	2015	2014
	(in thousands)		
Linaclotide[1]	$ 40,130	$ 48,981	$ 48,340
Lesinurad[2]	18,413	—	—
Development candidates:			
GI disorders (three compounds)[3]	27,795	19,152	15,992
Vascular and fibrotic disorders (two compounds)[3]	29,809	20,465	11,775
Central nervous system disorders (one compound)[3]	853	1,653	2,190
Total development candidates	58,457	41,270	29,957
Discovery research	22,492	18,495	23,593
	$ 139,492	$ 108,746	$ 101,890

(1) Includes linaclotide in all indications, populations and formulations.
(2) Includes lesinurad in all indications, populations and formulations.
(3) Number of compounds is for the year ended December 31, 2016.

Since 2004, the date we began tracking costs by program, we have incurred approximately $395.8 million of research and development expenses related to linaclotide. The expenses for linaclotide include both our portion of the research and development costs incurred by Allergan for the U.S. and AstraZeneca for China, Hong Kong and Macau and invoiced to us under the cost-sharing provisions of our collaboration agreements, as well as the unreimbursed portion of research and development costs incurred by us under such cost-sharing provisions.

The lengthy process of securing regulatory approvals for new drugs requires the expenditure of substantial resources. Any failure by us to obtain, or any delay in obtaining, regulatory approvals would materially adversely affect our product development efforts and our business overall.

In connection with the FDA approval of LINZESS, we are required to conduct certain nonclinical and clinical studies, including those aimed at understanding: (a) whether orally administered linaclotide can be detected in breast milk, (b) the potential for antibodies to be developed to linaclotide, and if so, (c) whether antibodies specific for linaclotide could have any therapeutic or safety implications. In addition, we and Allergan established a nonclinical and clinical post-marketing plan with the FDA to understand the efficacy and safety of LINZESS in pediatric patients. We and Allergan have initiated two Phase II clinical pediatric studies in IBS-C patients age seven to 17 and functional constipation patients age six to 17. We and Allergan are also exploring development opportunities to enhance the clinical profile of LINZESS by studying linaclotide in additional indications, populations and formulations to assess its potential to treat various GI conditions. In October 2012, we entered into a collaboration agreement with AstraZeneca to co-develop and co-commercialize linaclotide in China, Hong Kong and Macau, with AstraZeneca having primary responsibility for the local operational execution. We cannot currently estimate with any degree of certainty the amount of time or money that we will be required to expend in the future on linaclotide for other geographic markets within IBS-C and CIC, or in additional indications, populations or formulations.

In December 2015, the FDA approved ZURAMPIC for use in conjunction with an XOI for the treatment of hyperuricemia associated with uncontrolled gout. In connection with the FDA approval, the FDA has required a post-marketing clinical study to further evaluate the renal and cardiovascular safety of ZURAMPIC, and has required that enrollment include patients with moderate renal impairment. Pursuant to the terms of the Lesinurad License, AstraZeneca is obligated to undertake certain activities related to this post-marketing clinical study and we are obligated

to reimburse AstraZeneca up to $100.0 million over up to ten years for completion of such activities. Furthermore, we and AstraZeneca, on our behalf, are undertaking additional development activities related to lesinurad.

We are also advancing other development programs such as IW-3718, a development program targeting uncontrolled GERD, DUZALLO, the fixed dose combination product containing lesinurad and allopurinol targeting uncontrolled gout, and sGC development programs targeting vascular and fibrotic diseases.

Given the inherent uncertainties that come with the development of pharmaceutical products, we cannot estimate with any degree of certainty how our programs will evolve, and therefore the amount of time or money that would be required to obtain regulatory approval to market them.

As a result of these uncertainties surrounding the timing and outcome of any approvals, we are currently unable to estimate precisely when, if ever, linaclotide or lesinurad's utility will be expanded within their currently approved indications, if or when linaclotide or lesinurad will be developed outside of their current markets, indications, populations or formulations, or when, if ever, any of our other product candidates will generate revenues and cash flows.

We invest carefully in our pipeline, and the commitment of funding for each subsequent stage of our development programs is dependent upon the receipt of clear, supportive data. In addition, we intend to access externally discovered drug candidates that fit within our core strategy. In evaluating these potential assets, we apply the same investment criteria as those used for investments in internally discovered assets.

The successful development of our product candidates is highly uncertain and subject to a number of risks including, but not limited to:

- The duration of clinical trials may vary substantially according to the type, complexity and novelty of the product candidate.
- The FDA and comparable agencies in foreign countries impose substantial and varying requirements on the introduction of therapeutic pharmaceutical products, typically requiring lengthy and detailed laboratory and clinical testing procedures, sampling activities and other costly and time-consuming procedures.
- Data obtained from nonclinical and clinical activities at any step in the testing process may be adverse and lead to discontinuation or redirection of development activity. Data obtained from these activities also are susceptible to varying interpretations, which could delay, limit or prevent regulatory approval.
- The duration and cost of discovery, nonclinical studies and clinical trials may vary significantly over the life of a product candidate and are difficult to predict.
- The costs, timing and outcome of regulatory review of a product candidate may not be favorable, and, even if approved, a product may face post-approval development and regulatory requirements.
- There may be substantial costs, delays and difficulties in successfully integrating externally developed product candidates into our business operations.
- The emergence of competing technologies and products and other adverse market developments may negatively impact us.

As a result of the factors discussed above, including the factors discussed under "Risk Factors" in Item 1A of this Annual Report on Form 10-K, we are unable to determine the duration and costs to complete current or future nonclinical and clinical stages of our product candidates or when, or to what extent, we will generate revenues from the commercialization and sale of our product candidates. Development timelines, probability of success and development costs vary widely. We anticipate that we will make determinations as to which additional programs to pursue and how much funding to direct to each program on an ongoing basis in response to the data of each product candidate, the competitive landscape and ongoing assessments of such product candidate's commercial potential.

We expect our research and development costs will be substantial for the foreseeable future. We will continue to invest in linaclotide and lesinurad, including the investigation of ways to enhance the clinical profile within their currently approved indications, and the exploration of their potential utility in other indications, populations and

formulations. We will also invest in our other product candidates as we advance them through nonclinical studies and clinical trials, in addition to funding full-time equivalents for research and development activities under our external collaboration and license agreements.

Selling, General and Administrative Expense. Selling, general and administrative expense consists primarily of compensation, benefits and other employee-related expenses for personnel in our administrative, finance, legal, information technology, business development, commercial, sales, marketing, communications and human resource functions. Other costs include the legal costs of pursuing patent protection of our intellectual property, general and administrative related facility costs, insurance costs and professional fees for accounting and legal services. As we continue to invest in the commercialization of LINZESS and ZURAMPIC, we expect our selling, general and administrative expenses will be substantial for the foreseeable future. We record all selling, general and administrative expenses as incurred.

Under our AstraZeneca collaboration agreement for linaclotide, we are reimbursed for certain selling, general and administrative expenses and we net these reimbursements against our selling, general and administrative expenses as incurred. We include Allergan's selling, general and administrative cost-sharing payments in the calculation of the net profits and net losses from the sale of LINZESS in the U.S. and present the net payment to or from Allergan as collaboration expense or collaborative arrangements revenue, respectively.

Amortization of Acquired Intangible Asset. Amortization expense is based on the economic consumption of intangible assets. Our amortization is related to the ZURAMPIC intangible asset, which is amortized on a straight-line basis over the estimated useful life. We believe that the straight-line method of amortization represents the pattern in which the economic benefits of the ZURAMPIC intangible asset are consumed.

(Gain)/Loss on Fair Value Remeasurement of Contingent Consideration. Our contingent consideration obligation related to the Lesinurad Transaction consists of the fair value of estimated future milestone and royalty payments. This liability is revalued at each reporting period. Changes in the fair value of our contingent consideration, other than changes due to payments, are recognized as a (gain)/loss on fair value remeasurement of contingent consideration in our consolidated statement of operations. Adjustments are recorded when there are changes in significant assumptions, including net sales projections, probability weighted net cash outflow projections, the discount rate, passage of time, and the yield curve equivalent to our credit risk, which is based on the estimated cost of debt for market participants.

Other (Expense) Income. Interest expense consists primarily of cash and non-cash interest costs related to the 2022 Notes and our outstanding PhaRMA Notes, which were redeemed, in full, in connection with the funding and issuance in January 2017 of the 2026 Notes. Non-cash interest expense consists of amortization of the debt discount and associated debt issuance costs associated with the 2022 Notes and PhaRMA Notes. We amortize these costs using the effective interest rate method over the life of the respective note agreements as interest expense in our consolidated statements of operations.

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

In June 2015, in connection with the issuance of the 2022 Notes, we entered into convertible note hedge transactions, or the Convertible Note Hedges. Concurrently with entering into the Convertible Note Hedges, we also entered into certain warrant transactions in which we sold note hedge warrants, or the Note Hedge Warrants, to the Convertible Note Hedge counterparties to acquire 20,249,665 shares of our Class A common stock, subject to customary anti-dilution adjustments. Loss on derivatives consists of the change in fair value of the Convertible Note Hedges and Note Hedge Warrants, which are recorded as derivative assets and liabilities. The Convertible Note Hedges and the Note Hedge Warrants are recorded at fair value at each reporting period and changes in fair value are recorded in our consolidated statements of operations.

In September 2016, we closed a direct private placement, pursuant to which we issued $150.0 million in aggregate principal amount of 8.375% notes due 2026 on January 5, 2017, or the Funding Date. The proceeds from the issuance of the 2026 Notes were used to redeem the outstanding principal balance of the PhaRMA Notes on the Funding Date. This transaction is more fully described in Note 11, *Notes Payable,* and Note 20, *Subsequent Events,* to our consolidated financial statements appearing elsewhere in this Annual Report on Form 10-K.

Critical Accounting Policies and Estimates

Our discussion and analysis of our financial condition and results of operations is based upon our consolidated financial statements prepared in accordance with U.S. generally accepted accounting principles. The preparation of these financial statements requires us to make certain estimates and assumptions that may affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the consolidated financial statements, and the amounts of revenues and expenses during the reported periods. Significant estimates and assumptions in our consolidated financial statements include those related to revenue recognition, including returns, rebates, and other pricing adjustments; available-for-sale securities; inventory valuation, and related reserves; impairment of long-lived assets; initial valuation procedures for the issuance of convertible notes; fair value of derivatives; balance sheet classification of notes payable and convertible notes; income taxes, including the valuation allowance for deferred tax assets; research and development expenses; goodwill; contingent consideration; acquired intangible assets; contingencies and share-based compensation. We base our estimates on our historical experience and on various other assumptions that are believed to be reasonable, the results of which form the basis for making judgments about the carrying values of assets and liabilities. Actual results may differ materially from our estimates under different assumptions or conditions. Changes in estimates are reflected in reported results in the period in which they become known.

We believe that our application of the following accounting policies, each of which require significant judgments and estimates on the part of management, are the most critical to aid in fully understanding and evaluating our reported financial results. Our significant accounting policies are more fully described in Note 2, *Summary of Significant Accounting Policies*, to our consolidated financial statements appearing elsewhere in this Annual Report on Form 10-K.

Fair Value Measurements

We have certain assets and liabilities that are measured at fair value on a recurring basis, and which have been classified as Level 1, 2 or 3 within the fair value hierarchy as described in the accounting standards for fair value measurements. In general, fair values determined by Level 1 inputs utilize observable inputs such as quoted prices in active markets for identical assets or liabilities. Fair values determined by Level 2 inputs utilize data points that are either directly or indirectly observable, such as quoted prices for similar instruments in active markets, interest rates and yield curves. Fair values determined by Level 3 inputs utilize unobservable data points in which there is little or no market data, which require us to develop our own assumptions for the asset or liability.

Our investment portfolio includes mainly fixed income securities that do not always trade on a daily basis. As a result, the pricing services we use apply other available information as applicable through processes such as benchmark yields, benchmarking of like securities, sector groupings and matrix pricing to prepare valuations. In addition, model processes are used to assess interest rate impact and develop prepayment scenarios. These models take into consideration relevant credit information, perceived market movements, sector news and economic events. The inputs into these models may include benchmark yields, reported trades, broker-dealer quotes, issuer spreads and other relevant data. We validate the prices provided by our third party pricing services by obtaining market values from other pricing sources and analyzing pricing data in certain instances.

We classify our derivative financial instruments and contingent consideration as Level 3 under the fair value hierarchy. The derivatives are not actively traded and are valued using the Black-Scholes option pricing model which requires the use of subjective assumptions, primarily the expected stock price volatility assumption. The contingent consideration is not actively traded and is valued using the Monte-Carlo simulation which requires the use of subjective assumptions, including probability weighted net cash outflow projections, discounted using a yield curve equivalent to the Company's credit risk, which was the estimated cost of debt financing for market participants.

Inventory Valuation

Inventory is stated at the lower of cost or net realizable value with cost determined under the first-in, first-out basis in accordance with Accounting Standards Update, or ASU, No. 2015-11, *Inventory (Topic 330): Simplifying the Measurement of Inventory*.

We evaluate inventory levels quarterly and any inventory that has a cost basis in excess of its expected net realizable value, inventory that becomes obsolete, inventory in excess of expected sales requirements, inventory that fails to meet commercial sale specifications or is otherwise impaired is written down with a corresponding charge to the

statement of operations in the period that the impairment is first identified. We also assess, on a quarterly basis, whether we have any excess non-cancelable purchase commitments resulting from minimum supply agreements with our suppliers. We rely on data from several sources to estimate the net realizable value of inventory and non-cancelable purchase commitments, including partner forecasts of projected inventory purchases that are received quarterly, our internal forecasts and related process, historical sales by geographic region, and the status of and progress toward commercialization of linaclotide in partnered territories.

We capitalize inventories manufactured in preparation for initiating sales of a product candidate when the related product candidate is considered to have a high likelihood of regulatory approval and the related costs are expected to be recoverable through sales of the inventories. In determining whether or not to capitalize such inventories, we evaluate, among other factors, information regarding the product candidate's safety and efficacy, the status of regulatory submissions and communications with regulatory authorities and the outlook for commercial sales, including the existence of current or anticipated competitive drugs and the availability of reimbursement. In addition, we evaluate risks associated with manufacturing the product candidate, including the ability of our third-party suppliers to complete the validation batches, and the remaining shelf life of the inventories.

Costs associated with developmental products prior to satisfying the inventory capitalization criteria are charged to research and development expense as incurred.

There is a risk inherent in these judgments and any changes in these judgments may have a material impact on our financial results in future periods.

Finite-Lived and Indefinite-Lived Intangible Assets

We record the fair value of purchased intangible assets with finite useful lives as of the transaction date of a business combination. Purchased intangible assets with finite useful lives are amortized to their estimated residual values over their estimated useful lives. We evaluate the finite-lived intangible assets for impairment whenever events or changes in circumstances indicate the reduction in the fair value below their respective carrying amounts. If we determine that an impairment has occurred, a write-down of the carrying value and an impairment charge to operating expenses in the period the determination is made is recorded. In addition, the remaining estimated useful life of the finite-lived intangible asset would be reassessed.

In accordance with Accounting Standards Codification, or ASC, Topic 350, *Intangibles — Goodwill and Other*, or ASC 350, during the period that an asset is considered indefinite-lived, such as in-process research and development, or IPR&D, it will not be amortized. Acquired IPR&D represents the fair value assigned to research and development assets that have not reached technological feasibility. The value assigned to acquired IPR&D is determined by estimating the costs to develop the acquired technology into commercially viable products, estimating the resulting revenue from the projects, and discounting the net cash flows to present value. The revenue and costs projections used to value acquired IPR&D are, as applicable, reduced based on the probability of success of developing a new drug. Additionally, the projections consider the relevant market sizes and growth factors, expected trends in technology, and the nature and expected timing of new product introductions by us and our competitors. The rates utilized to discount the net cash flows to their present value are commensurate with the stage of development of the projects and uncertainties in the economic estimates used in the projections. Upon the acquisition of IPR&D, we complete an assessment of whether our acquisition constitutes the purchase of a single asset or a group of assets. Multiple factors are considered in this assessment, including the nature of the technology acquired, the presence or absence of separate cash flows, the development process and stage of completion, quantitative significance and the rationale for entering into the transaction. Indefinite-lived assets are maintained on our consolidated balance sheet until either the project underlying it is completed or the asset becomes impaired. Indefinite-lived assets are tested for impairment on an annual basis, or whenever events or changes in circumstances indicate the reduction in the fair value of the IPR&D asset below its respective carrying amount. If we determine that an impairment has occurred, a write-down of the carrying value and an impairment charge to operating expenses in the period the determination is made is recorded. When development of an IPR&D asset is complete, the associated asset is deemed finite-lived and is then amortized based on its respective estimated useful life at that point.

Goodwill

Goodwill represents the difference between the purchase price and the fair value of the identifiable tangible and intangible net assets when accounted for using the purchase method of accounting. Goodwill is not amortized, but is reviewed for impairment. We test goodwill for impairment annually, or whenever events or changes in circumstances

indicate an impairment may have occurred, by comparing the carrying value to its implied fair value in accordance with ASC 350. Impairment may result from, among other things, deterioration in the performance of the acquired asset, adverse market conditions, adverse changes in applicable laws or regulations and a variety of other circumstances. If we determine that an impairment has occurred, a write-down of the carrying value and an impairment charge to operating expenses in the period the determination is made is recorded. In evaluating the carrying value of goodwill, we must make assumptions regarding estimated future cash flows and other factors. Changes in strategy or market conditions could significantly impact those judgments in the future and require an adjustment to the recorded balances.

Derivative Assets and Liabilities

In June 2015, in connection with the issuance of the 2022 Notes, we entered into the Convertible Note Hedges. Concurrently with entering into the Convertible Note Hedges, we also entered into certain warrant transactions in which we sold Note Hedge Warrants to the Convertible Note Hedge counterparties to acquire 20,249,665 shares of our Class A common stock, subject to customary anti-dilution adjustments. These instruments are derivative financial instruments under ASC Topic 815, *Derivatives and Hedging*.

These derivatives are recorded as assets or liabilities at fair value each reporting period and the fair value is determined using the Black-Scholes option-pricing model. The changes in fair value are recorded as a component of other (expense) income in the consolidated statements of operations. Significant inputs used to determine the fair value include the price per share of our Class A common stock on the date of valuation, time to maturity of the derivative instruments, the strike prices of the derivative instruments, the risk-free interest rate, and the volatility of our Class A common stock. Changes to these inputs could materially affect the valuation of the Convertible Note Hedges and Note Hedge Warrants in future periods.

Revenue Recognition

Our revenues are generated primarily through collaborative arrangements and licensing related to the research and development and commercialization of linaclotide, as well as co-promotion arrangements in the U.S. and product revenue related to the commercial sale of ZURAMPIC in the U.S. The terms of the collaborative research and development, licensing, and co-promotion agreements contain multiple deliverables which may include (i) licenses, (ii) research and development activities, including participation on joint steering committees, (iii) the manufacture of finished drug product, API or development materials for a partner, which are reimbursed at a contractually determined rate, and (iv) co-promotion activities by our clinical sales specialists. Non-refundable payments to us under these agreements may include (i) up-front license fees, (ii) payments for research and development activities, (iii) payments for the manufacture of finished drug product, API or development materials, (iv) payments based upon the achievement of certain milestones, (v) payments for sales detailing, promotional support services and medical education initiatives, and (vi) royalties on product sales. Additionally, we may receive our share of the net profits or bear our share of the net losses from the sale of linaclotide in the U.S. and China through our collaborations with Allergan and AstraZeneca, respectively.

We evaluate revenue from new agreements that have multiple elements under the guidance of ASU No. 2009-13, *Multiple-Deliverable Revenue Arrangements*, or ASU 2009-13. We also evaluate whether amendments to our multiple element arrangements are considered material modifications that are subject to the application of ASU 2009-13. This evaluation requires us to assess all relevant facts and circumstances and to make subjective determinations and judgments. As part of this assessment, we consider whether the modification results in a material change to the arrangement, including whether there is a change in total arrangement consideration that is more than insignificant, whether there are changes in the deliverables included in the arrangement, whether there is a change in the term of the arrangement and whether there is a significant modification to the delivery schedule for contracted deliverables.

We identify the deliverables included within multiple element agreements and evaluate which deliverables represent separate units of accounting. We account for those components as separate elements when the following criteria are met:

- the delivered items have value to the customer on a stand-alone basis; and
- if there is a general right of return relative to the delivered items, delivery or performance of the undelivered items is considered probable and within our control.

This evaluation requires subjective determinations and requires us to make judgments about the individual deliverables and whether such deliverables are separable from the other aspects of the contractual relationship. In determining the units of accounting, we evaluate certain criteria, including whether the deliverables have standalone value, based on consideration of the relevant facts and circumstances for each arrangement. Factors considered in this determination include the research, manufacturing and commercialization capabilities of the partner and the availability of peptide research and manufacturing expertise in the general marketplace. In addition, we consider whether the collaborator can use the license or other deliverables for their intended purpose without the receipt of the remaining elements, and whether the value of the deliverable is dependent on the undelivered items and whether there are other vendors that can provide the undelivered items.

The consideration received is allocated among the separate units of accounting using the relative selling price method, and the applicable revenue recognition criteria are applied to each of the separate units.

We determine the estimated selling price for deliverables using vendor-specific objective evidence, or VSOE, of selling price, if available, third-party evidence, or TPE, of selling price if VSOE is not available, or best estimate of selling price, or BESP, if neither VSOE nor TPE is available. Determining the BESP for a deliverable requires significant judgment. We use BESP to estimate the selling price for licenses to our proprietary technology, since we often do not have VSOE or TPE of selling price for these deliverables. In those circumstances where we utilize BESP to determine the estimated selling price of a license to our proprietary technology, we consider market conditions as well as entity-specific factors, including those factors contemplated in negotiating the agreements as well as internally developed models that include assumptions related to the market opportunity, estimated development costs, probability of success and the time needed to commercialize a product candidate pursuant to the license. In validating our BESP, we evaluate whether changes in the key assumptions used to determine the BESP will have a significant effect on the allocation of arrangement consideration between multiple deliverables.

We recognize revenue when there is persuasive evidence that an arrangement exists, services have been rendered or delivery has occurred, the price is fixed or determinable, and collection is reasonably assured.

For certain of our arrangements, particularly our linaclotide license agreement with Allergan for all countries worldwide other than China, Hong Kong, Macau, Japan, and the countries and territories of North America, it is required that taxes be withheld on payments to us. We have adopted a policy to recognize revenue net of these tax withholdings.

Net Profit or Net Loss Sharing

The determination of whether we should recognize revenue on a gross or net basis involves judgment based on the relevant facts and circumstances. In accordance with ASC Topic 808, *Collaborative Arrangements*, and ASC 605-45, *Principal Agent Considerations*, we consider the nature and contractual terms of the arrangement and the nature of our business operations to determine the classification of the transactions under our collaboration agreements. We record revenue transactions gross in the consolidated statements of operations if we are deemed the principal in the transaction, which includes being the primary obligor and having the risks and rewards of ownership.

We recognize our share of the pre-tax commercial net profit or net loss generated from the sales of LINZESS in the U.S. in the period the product sales are reported by Allergan and related cost of goods sold and selling, general and administrative expenses are incurred by us and our collaboration partner. These amounts are partially determined based on amounts provided by Allergan and involve the use of estimates and judgments, such as product sales allowances and accruals related to prompt payment discounts, chargebacks, governmental and contractual rebates, wholesaler fees, product returns, and co-payment assistance costs, which could be adjusted based on actual results in the future. We are highly dependent on Allergan for timely and accurate information regarding any net revenues realized from sales of LINZESS in the U.S. and the costs incurred in selling it, in order to accurately report our results of operations. For the periods covered in the consolidated financial statements presented, there have been no material changes to prior period estimates of revenues, cost of goods sold or selling, general and administrative expenses associated with the sales of LINZESS in the U.S. However, if we do not receive timely and accurate information or incorrectly estimate activity levels associated with the collaboration at a given point in time, we could be required to record adjustments in future periods.

We record our share of the net profits or net losses from the sales of LINZESS in the U.S. on a net basis and present the settlement payments to and from Allergan as collaboration expense or collaborative arrangements revenue, as

applicable, as we are not the primary obligor and do not have the risks and rewards of ownership in the collaboration agreement with Allergan for North America. We and Allergan settle the cost sharing quarterly, such that our statement of operations reflects 50% of the pre-tax net profit or loss generated from sales of LINZESS in the U.S.

Up-Front License Fees

For nonrefundable up-front license fees related to arrangements entered into prior to the adoption of ASU 2009-13, including the $30.0 million up-front license fee under the Astellas license agreement entered into in November 2009, we recognized revenues on a straight-line basis over the contracted or estimated period of performance since the license deliverables were not deemed to have value on a standalone basis under pre ASU 2009-13 guidance and we could not determine the fair value of the undelivered elements. The period of performance over which the revenues are recognized is typically the period over which the research and/or development is expected to occur. Accordingly, we were required to make estimates regarding the drug development and commercialization timelines for compounds being developed pursuant to any applicable agreement. The determination of the length of the period over which to recognize the revenue is subject to judgment and estimation and could have an impact on the amount of revenue recognized in a given period. Quarterly, we reassessed our period of substantial involvement over which we amortized our up-front license fees and made adjustments as appropriate. At December 31, 2016, the up-front fees associated with our license arrangement with Astellas were fully amortized as the period of performance had ended. The up-front license fees under the Allergan collaboration for North America and the Allergan collaboration for Europe (previously with Almirall) were fully amortized at December 31, 2015, as the period of performance under those arrangements ended in the three months ended September 30, 2012.

For nonrefundable up-front license fees related to arrangements entered into or materially modified after the adoption ASU 2009-13, we recognize revenue allocated to the license upon delivery, when we believe the license to our intellectual property has stand-alone value. This includes the amounts allocated to the license under the AstraZeneca collaboration agreement for linaclotide entered into in October 2012. When we recognize revenue allocated to the license upon delivery under any of our collaborations, we may experience significant fluctuations in our collaborative arrangements revenues from quarter to quarter and year to year depending on the timing of transactions. When we believe the license to our intellectual property does not have stand-alone value from the other deliverables to be provided in the arrangement, it is combined with other deliverables and the revenue of the combined unit of accounting is recorded based on the method appropriate for the last delivered item.

Milestones

At the inception of each arrangement that includes pre-commercial milestone payments, we evaluate whether each pre-commercial milestone is substantive, in accordance with ASU No. 2010-17, *Revenue Recognition—Milestone Method,* or ASU 2010-17. This evaluation includes an assessment of whether (a) the consideration is commensurate with either (1) the entity's performance to achieve the milestone, or (2) the enhancement of the value of the delivered item(s) as a result of a specific outcome resulting from the entity's performance to achieve the milestone, (b) the consideration relates solely to past performance and (c) the consideration is reasonable relative to all of the deliverables and payment terms within the arrangement. We evaluate factors such as the scientific, clinical, regulatory, commercial and other risks that must be overcome to achieve the respective milestone, the level of effort and investment required and whether the milestone consideration is reasonable relative to all deliverables and payment terms in the arrangement in making this assessment. At December 31, 2016, we had no pre-commercial milestones that were deemed substantive. If a substantive pre-commercial milestone were achieved and collection of the related receivable was reasonably assured, we would recognize revenue related to the milestone in its entirety in the period in which the milestone was achieved. If we achieve milestones that we consider substantive under any of our collaborations, we may experience significant fluctuations in our collaborative arrangements revenue from quarter to quarter and year to year depending on the timing of achieving such substantive milestones. In those circumstances where a pre-commercial milestone is not substantive, we recognize as revenue on the date the milestone is achieved an amount equal to the applicable percentage of the performance period that had elapsed as of the date the milestone was achieved, with the balance being deferred and recognized over the remaining period of performance.

Commercial milestones are accounted for as royalties and are recorded as revenue upon achievement of the milestone, assuming all other revenue recognition criteria are met.

Royalties on Product Sales

We receive, or expect to receive in the future, royalty revenues under certain of our license or collaboration agreements. If we do not have any future performance obligations under these license or collaborations agreements, we record these revenues as earned. To the extent we do not have access to the royalty reports from our partners or the ability to accurately estimate the royalty revenue in the period earned, we record such royalty revenues one quarter in arrears.

Product Revenue, Net

Net product revenue is derived from sales of ZURAMPIC in the U.S. Pursuant to the terms and conditions of the Lesinurad TSA, we sell ZURAMPIC principally to a limited number of major wholesalers and selected regional wholesalers through certain of AstraZeneca's existing arrangements, or the Distributors. The Distributors subsequently resell ZURAMPIC to patients and healthcare providers.

We recognize net product revenue from sales of ZURAMPIC in accordance with ASC 605, Revenue Recognition, or ASC 605, when persuasive evidence of an arrangement exists, delivery has occurred and title of the product and associated risk of loss has passed to the customer, the price is fixed or determinable, and collection from the customer has been reasonably assured. ASC 605 requires, among other criteria, that future returns can be reasonably estimated in order to recognize revenue. We recognize revenue on a gross basis as we have concluded that we are the principal in the product revenue transactions for ZURAMPIC, as we hold the general inventory risk, latitude in establishing price, physical loss inventory risk and credit risk.

The first units of ZURAMPIC were shipped to Distributors in September 2016 under the Lesinurad TSA. Due to the early stage of the product launch, we determined that we were not able to reliably make certain estimates, including returns, necessary to recognize product revenue upon shipment to Distributors. As a result, we record net product revenue for ZURAMPIC using a deferred revenue recognition model (sell-through). Under the deferred revenue model, we do not recognize revenue until ZURAMPIC is prescribed to an end-user. During the transition services period, pursuant to the Lesinurad TSA, AstraZeneca invoices Distributors upon shipment of ZURAMPIC on our behalf. We record deferred revenue upon receipt of the quarterly cash payment from AstraZeneca for shipments of ZURAMPIC to Distributors. We had not received any such payments as of December 31, 2016. We recognize net product revenue when ZURAMPIC is prescribed to the end-user, on a first-in, first-out basis using estimated prescription demand and pharmacy demand from third party sources and our analysis of third party market research data, as well as other third party information. Our estimates are subject to the inherent limitations of estimates that rely on third party data, as certain third party information is itself in the form of estimates. We will continue to evaluate when, if ever, we have sufficient volume of historical activity and visibility into the distribution channel, in order to reasonably make all estimates required under ASC 605 to recognize revenue upon shipment to the Distributor.

Our net product revenues for ZURAMPIC represent total revenues less customer credits, including actual returns, rebates, and other discounts. These allowances are recorded for cash consideration given by a vendor to a customer that is presumed to be a reduction of the selling prices of our products or services and, therefore, characterized as a reduction of revenue.

The cost basis of the product we have purchased pursuant to the Lesinurad TSA is included as a component of other current assets on our consolidated balance sheets. Upon recognition of product revenue, the corresponding product cost is recorded as cost of revenues on our consolidated statements of operations.

Other

We produce finished linaclotide drug product, API and development materials for certain of our partners.

We recognize revenue on linaclotide finished drug product, API and development materials when the material has passed all quality testing required for collaborator acceptance, delivery has occurred, title and risk of loss have transferred to the partner, the price is fixed or determinable, and collection is reasonably assured. As it relates to development materials and API produced for Astellas, we are reimbursed at a contracted rate. Such reimbursements are considered as part of revenue generated pursuant to the Astellas license agreement and are presented as collaborative arrangements revenue. Any linaclotide finished drug product, API and development materials currently produced for

Allergan for the U.S. or AstraZeneca for China, Hong Kong and Macau are recognized in accordance with the cost-sharing provisions of the Allergan and AstraZeneca collaboration agreements, respectively. In October 2015, Almirall transferred its exclusive license to develop and commercialize linaclotide in Europe to Allergan, and we separately entered into an amendment to the license agreement with Allergan relating to the development and commercialization of linaclotide in Europe. Pursuant to the terms of the amendment, Allergan assumed responsibility for the manufacturing of linaclotide API for Europe from us, as well as the associated costs. We may experience fluctuations in our collaborative arrangements revenue from quarter to quarter and year to year depending on the timing of such transactions.

The agreements above are more fully described in Note 5, *Collaboration, License, Co-promotion and Other Commercial Agreements,* in the accompanying notes to our consolidated financial statements appearing elsewhere in this Annual Report on Form 10-K.

Research and Development Expense

All research and development expenses are expensed as incurred. We defer and capitalize nonrefundable advance payments we make for research and development activities until the related goods are received or the related services are performed.

Research and development expenses are comprised of costs incurred in performing research and development activities, including salary, benefits and other employee-related expenses; share-based compensation expense; laboratory supplies and other direct expenses; facilities expenses; overhead expenses; third-party contractual costs relating to nonclinical studies and clinical trial activities and related contract manufacturing expenses, development of manufacturing processes and regulatory registration of third-party manufacturing facilities; licensing fees for our product candidates; and other outside expenses.

Clinical trial expenses include expenses associated with contract research organizations, or CROs. The invoicing from CROs for services rendered can lag several months. We accrue the cost of services rendered in connection with CRO activities based on our estimate of site management, monitoring costs, project management costs, and investigator fees. We maintain regular communication with our CRO vendors to gauge the reasonableness of our estimates. Differences between actual clinical trial expenses and estimated clinical trial expenses recorded have not been material and are adjusted for in the period in which they become known. However, if we incorrectly estimate activity levels associated with the CRO services at a given point in time, we could be required to record material adjustments in future periods. Under our Allergan and AstraZeneca linaclotide collaboration agreements for the U.S. and China, Hong Kong and Macau, respectively, we are reimbursed for certain research and development expenses and we net these reimbursements against our research and development expenses as incurred. Amounts owed to Allergan or AstraZeneca for such territories are recorded as incremental research and development expense. Nonrefundable advance payments for research and development activities are capitalized and expensed over the related service period or as goods are received.

Share-Based Compensation Expense

We make certain assumptions in order to value and record expense associated with awards made under our share-based compensation arrangements. We estimate the fair value of the stock option awards for employees and non-employees using the Black-Scholes option-pricing model. The fair value of our restricted stock unit, or RSU, awards is based on the market value of our Class A common stock on the date of grant. Determining the fair value of share-based awards requires the use of highly subjective assumptions, including expected term of the award and expected stock price volatility. For certain of these awards, we determine the appropriate amount to expense based on the anticipated achievement of performance targets, which requires judgment, including forecasting the achievement of future specified targets. Changes in these assumptions may lead to variability with respect to the amount of expense we recognize in connection with share-based payments.

We recognize compensation expense on a straight-line basis over the requisite service period based upon stock options that are ultimately expected to vest, and accordingly, such compensation expense is adjusted by the amount of estimated forfeitures. We estimate forfeitures over the requisite service period when recognizing share-based compensation expense based on historical rates and forward-looking factors; these estimates are adjusted to the extent that actual forfeitures differ, or are expected to materially differ, from our estimates.

We have also granted time-accelerated stock options with terms that allow the acceleration in vesting of the stock options upon the achievement of performance-based milestones specified in the grants. Share-based compensation expense associated with these time-accelerated stock options is recognized over the requisite service period of the awards or the implied service period, if shorter.

While the assumptions used to calculate and account for share-based compensation awards represent management's best estimates, these estimates involve inherent uncertainties and the application of management's judgment. As a result, if revisions are made to our underlying assumptions and estimates, our share-based compensation expense could vary significantly from period to period.

Business Combinations

We evaluate acquisitions of assets and other similar transactions to assess whether or not the transaction should be accounted for as a business combination by assessing whether or not we have acquired inputs and processes that have the ability to create outputs. If determined to be a business combination, we account for business acquisitions under the acquisition method of accounting as indicated in the Financial Accounting Standards Board, or FASB, issued ASC 805, which requires the acquiring entity in a business combination to recognize the fair value of all assets acquired, liabilities assumed, and any non-controlling interest in the acquiree and establishes the acquisition date as the fair value measurement point. Accordingly, we recognize assets acquired and liabilities assumed in business combinations, including contingent liabilities and non-controlling interest in the acquiree based on the fair value estimates as of the date of acquisition. In accordance with ASC 805, we recognize and measure goodwill as of the acquisition date, as the excess of the fair value of the consideration paid over the fair value of the identified net assets acquired.

The consideration for our business acquisitions include future payments that are contingent upon the occurrence of a particular event or events. The obligations for such contingent consideration payments are recorded at fair value on the acquisition date. The contingent consideration obligations are then evaluated each reporting period. Changes in the fair value of contingent consideration obligations, other than changes due to payments, are recognized as a (gain) loss on fair value remeasurement of contingent consideration in our consolidated statements of operations.

Results of Operations

The following discussion summarizes the key factors our management believes are necessary for an understanding of our consolidated financial statements.

	Year Ended December 31,		
	2016	2015	2014
	(in thousands)		
Collaborative arrangements revenue	$ 273,957	$ 149,555	$ 76,436
Cost and expenses:			
Cost of revenues, excluding amortization of acquired intangible asset	1,868	12	5,291
Write-down of inventory to net realizable value and loss on non-cancellable purchase commitments	374	17,638	20,292
Research and development	139,492	108,746	101,890
Selling, general and administrative	173,281	125,247	118,333
Amortization of acquired intangible asset	981	—	—
Loss on fair value remeasurement of contingent consideration	9,831	—	—
Total cost and expenses	325,827	251,643	245,806
Loss from operations	(51,870)	(102,088)	(169,370)
Other (expense) income:			
Interest expense	(39,153)	(31,096)	(21,166)
Interest and investment income	1,169	443	257
Gain (loss) on derivatives	8,146	(9,928)	—
Other income	—	—	661
Other expense, net	(29,838)	(40,581)	(20,248)
Net loss	$ (81,708)	$ (142,669)	$ (189,618)

Year Ended December 31, 2016 Compared to Year Ended December 31, 2015

Revenues

	Year Ended December 31,		Change	
	2016	2015	$	%
	(dollars in thousands)			
Collaborative arrangements revenue	$273,957	$149,555	$124,402	83 %

Collaborative Arrangements Revenue. The increase in revenue from collaborative arrangements of approximately $124.4 million for the year ended December 31, 2016 compared to the year ended December 31, 2015 was primarily related to an approximately $84.3 million increase in our share of the net profits from the sale of LINZESS in the U.S.; an approximately $30.0 million increase due to the achievement of two development milestones in 2016 under our license agreement with Astellas; an approximately $9.4 million increase from shipments of linaclotide API to our linaclotide partners; an approximately $1.8 million increase attributable to the recognition of up-front payments and development milestones achieved prior to 2016 under our agreement with Astellas resulting from a revision of the estimated development period for linaclotide in Japan in September 2016; an approximately $1.6 million increase from our co-promotion agreement with Allergan for VIBERZI in the U.S.; an insignificant increase in royalty revenue based on sales of linaclotide in our partnered territories; and an insignificant increase due to the recognition of net product sales of ZURAMPIC in the U.S. in 2016. The increases were partially offset by an approximately $2.0 million decrease in revenue related to our collaboration agreement with AstraZeneca for linaclotide, and an approximately $0.9 million decrease in revenue related to the Cologuard Co-Promotion Agreement.

Cost and Expenses

	Year Ended December 31,		Change	
	2016	2015	$	%
	(dollars in thousands)			
Cost and expenses:				
Cost of revenues, excluding amortization of acquired intangible asset	$ 1,868	$ 12	$ 1,856	15,467 %
Write-down of inventory to net realizable value and loss on non-cancellable purchase commitments	374	17,638	(17,264)	(98)%
Research and development	139,492	108,746	30,746	28 %
Selling, general and administrative	173,281	125,247	48,034	38 %
Amortization of acquired intangible asset	981	—	981	100 %
Loss on fair value remeasurement of contingent consideration	9,831	—	9,831	100 %
Total cost and expenses	$325,827	$251,643	$ 74,184	29 %

Cost of Revenues, excluding amortization of acquired intangible asset. The increase in cost of revenue of approximately $1.9 million for the year ended December 31, 2016 compared to the year ended December 31, 2015 was primarily attributable to higher sales of linaclotide API to our partners and the launch of ZURAMPIC.

Write-down of inventory to net realizable value and loss on non-cancelable purchase commitments. The decrease in write-down of inventory and loss on non-cancelable purchase commitments of approximately $17.3 million for the year ended December 31, 2016 compared to the year ended December 31, 2015, was primarily related to the write-down of inventory and an accrual for a loss on excess non-cancelable inventory purchase commitments related to linaclotide API recorded during the year ended December 31, 2015, partially offset by a write-down of approximately $0.4 million related to lesinurad prepaid inventory.

Research and Development Expense. The increase in research and development expense of approximately $30.7 million for the year ended December 31, 2016 compared to the year ended December 31, 2015 was primarily related to an increase of approximately $14.5 million in the costs associated with development activities and transitional support services related to lesinurad; an increase of approximately $13.8 million in research costs related to our early stage pipeline candidates; an increase of approximately $9.6 million in net costs related to the collaboration with Allergan for North America; an increase of approximately $5.2 million in compensation, benefits and other employee-related expenses primarily associated with increased headcount; and an increase of approximately $4.2 million in operating costs, including facility costs such as rent and amortization of leasehold improvements allocated to research and development, and an increase of approximately $0.2 million related to the development of manufacturing processes and costs associated with linaclotide API prior to meeting our inventory capitalization policy. The increases were partially offset by an approximately $14.1 million decrease in external costs related to the development of linaclotide; a decrease of approximately $2.1 million decrease due to a reallocation of resources relating to quality testing and set-up cost related to the launch and commercialization of ZURAMPIC recorded as selling, general administrative expenses; and an approximately $0.6 million decrease in costs associated with the collaboration agreement with AstraZeneca for China.

Selling, General and Administrative Expense. Selling, general and administrative expenses increased approximately $48.0 million for the year ended December 31, 2016 compared to the year ended December 31, 2015 primarily as a result of an increase in our workforce and infrastructure expenses due to the launch and commercialization of ZURAMPIC in the U.S. This increase includes an approximately $17.0 million increase in compensation, benefits and other employee-related expenses associated with the increased headcount primarily in our field sales force; an approximately $12.4 million increase in costs associated with selling expenses, marketing programs, and speaker programs; an approximately $8.1 million increase in external consulting costs, recruiting costs and other professional service costs; an approximately $5.3 million increase in costs associated with other infrastructure costs related to lesinurad; an approximately $3.5 million increase in costs related to facilities and information technology infrastructure, including rent; and an approximately $1.7 million increase due to the internal costs relating to quality testing and set-up costs related to the launch and commercialization of ZURAMPIC.

Amortization of Acquired Intangible Asset. The increase in amortization of acquired intangible asset expense of approximately $1.0 million for the year ended December 31, 2016 compared to the year ended December 31, 2015 was

due to the Lesinurad Transaction that closed in June 2016, in which we acquired an exclusive license in the U.S. to, among other things, the approved product ZURAMPIC. The amount allocated to the ZURAMPIC intangible asset will be amortized on a straight-line basis over its estimated useful life of 13 years, the period of estimated future cash flows.

Loss on Fair Value remeasurement of contingent consideration. The increase in the fair value of the contingent consideration obligation of approximately $9.8 million for the year ended December 31, 2016 compared to the year ended December 31, 2015 was due to the Lesinurad Transaction. The change in the fair value remeasurement of contingent consideration from the date the Lesinurad Transaction closed, on June 2, 2016, to December 31, 2016 was primarily due to the passage of time and changes in the yield curve equivalent to our credit risk, which was the estimated cost of debt financing for similar market participants used in the valuation.

Other (Expense) Income, Net

	Year Ended December 31,		Change	
	2016	2015	$	%
	(dollars in thousands)			
Other (expense) income:				
Interest expense	$(39,153)	$(31,096)	$ (8,057)	26 %
Interest and investment income	1,169	443	726	164 %
Gain (loss) on derivatives	8,146	(9,928)	18,074	(182)%
Total other expense, net	$(29,838)	$(40,581)	$10,743	(26)%

Interest Expense. Interest expense increased approximately $8.1 million for the year ended December 31, 2016 compared to the year ended December 31, 2015, mainly due to an increase in interest expense of approximately $10.2 million associated with our 2022 Notes as we began incurring interest in June 2015. This increase was partially offset by a decrease of approximately $2.1 million in interest expense associated with the PhaRMA Notes for the year ended December 31, 2016 associated with the decreased principal balance, and a decrease of an insignificant amount due to interest associated with capital leases for the automobiles for our field-based sales force and medical science liaisons.

Interest and investment income. Interest and investment income increased approximately $0.7 million for the year ended December 31, 2016 compared to the year ended December 31, 2015, mainly due to an increase of approximately $0.7 million in investment income. This increase is partially offset by an insignificant decrease in interest income on certificate deposits.

Gain (loss) on derivatives. For the year ended December 31, 2016 we recorded a gain on derivatives of approximately $8.1 million resulting from an approximately $46.0 million increase in fair value of the Convertible Note Hedges and an approximately $37.9 million increase in the fair value of the Note Hedge Warrants. For the year ended December 31, 2015 we recorded a loss on derivatives of approximately $9.9 million resulting from an approximately $5.4 million decrease in fair value of the Convertible Note Hedges and an approximately $4.5 million decrease in the fair value of the Note Hedge Warrants.

Year Ended December 31, 2015 Compared to Year Ended December 31, 2014

Revenue

	Year Ended December 31,		Change	
	2015	2014	$	%
	(dollars in thousands)			
Collaborative arrangements revenue	$ 149,555	$ 76,436	$ 73,119	96 %

Collaborative Arrangements Revenue. The increase in revenue from collaborative arrangements of approximately $73.1 million for the year ended December 31, 2015 compared to the year ended December 31, 2014 was primarily related to an approximately $85.8 million increase in our share of the net profits from the sale of LINZESS in the U.S.; an approximately $4.4 million increase due to revenues from our co-promotion agreement with Exact Sciences for Cologuard in the U.S. entered into in March 2015; an approximately $0.8 million increase in royalty revenue based on sales of linaclotide in our partnered territories; and an approximately $0.2 million increase due to revenues from our

co-promotion agreement with Allergan for VIBERZI in the U.S. entered into in August 2015. The increases were partially offset by an approximately $8.1 million decrease in revenue recognized in connection with the achievement of a development milestone under our Astellas license agreement in 2014; an approximately $7.0 million decrease in revenue from the shipments of linaclotide API to our licensing partners; an approximately $1.9 million decrease in revenue recognized related to the achievement of commercial launch milestones under our license agreement with Almirall in 2014; and an approximately $1.1 million decrease in revenue related to our collaboration agreement with AstraZeneca.

Cost and Expenses

	Year Ended December 31,		Change	
	2015	2014	$	%
	(dollars in thousands)			
Cost and expenses:				
Cost of revenues	$ 12	$ 5,291	$ (5,279)	(100)%
Write-down of inventory to net realizable value and loss on non-cancellable purchase commitments	17,638	20,292	(2,654)	(13)%
Research and development	108,746	101,890	6,856	7 %
Selling, general and administrative	125,247	118,333	6,914	6 %
Total cost and expenses	$ 251,643	$ 245,806	$ 5,837	2 %

Cost of Revenues. The decrease in cost of revenue of approximately $5.3 million for the year ended December 31, 2015 compared to the year ended December 31, 2014 was primarily attributable to lower sales of linaclotide API to our licensing partners.

Write-down of inventory to net realizable value and loss on non-cancelable purchase commitments. The decrease in write-down of inventory and loss on non-cancelable purchase commitments of approximately $2.7 million for the year ended December 31, 2015 compared to the year ended December 31, 2014 was primarily related to an accrual for a loss on non-cancelable inventory purchase commitments recorded in the year ended December 31, 2015, partially offset by a decrease in the amount of inventory written down to estimated net realizable value.

Inventory represents linaclotide API that is available for commercial sale. We evaluate inventory levels quarterly and any inventory that has a cost basis in excess of its expected net realizable value, inventory that becomes obsolete, inventory in excess of expected sales requirements, inventory that fails to meet commercial sale specifications or is otherwise impaired is written down with a corresponding charge to the statement of operations in the period that the impairment is first identified. As part of our net realizable value assessment of our inventory, we assess whether we have any excess non-cancelable purchase commitments resulting from our two minimum supply agreements with our suppliers of linaclotide API outside of North America.

We have entered into multiple commercial supply agreements for the purchase of linaclotide API. Two of our API supply agreements for supplying API to our collaboration partners outside of North America contain minimum purchase commitments. Prior to October 2015, we were also responsible for the manufacturing of linaclotide API for Europe. As part of our net realizable value assessment of our inventory, we assess whether we have any excess non-cancelable purchase commitments resulting from our minimum supply agreements with our suppliers of linaclotide API.

The determination of the net realizable value of inventory and non-cancelable purchase commitments is based on demand forecasts from our partners that are received quarterly, to project the next 24 months of demand and our internal forecast for projected demand in subsequent years. During the three months ended June 30, 2015, Almirall, our former European partner, reduced its forecasted purchases of linaclotide API for its territory for the subsequent 18 months. In addition, regulatory changes made by the CFDA to the marketing approval process in China resulted in a potentially lengthened approval timeline for the commercialization of linaclotide. The reduced demand from Almirall, and the potential extended timeline for commercialization of linaclotide in China, resulted in lower projected sales of linaclotide API to our partners in Europe and China. As a result, during the three months ended June 30, 2015, we wrote-down the balance of our inventory of approximately $5.0 million to zero and accrued approximately $3.2 million for excess non-cancelable inventory purchase commitments.

In October 2015, Almirall transferred its exclusive license to develop and commercialize linaclotide in Europe to Allergan, and we separately entered into an amendment to the license agreement with Allergan relating to the development and commercialization of linaclotide in Europe. Pursuant to the terms of the amendment, Allergan assumed responsibility for the manufacturing of linaclotide API for Europe, as well as the associated costs. Upon the execution of the amendment to the license agreement, we recorded an incremental loss on non-cancelable API purchase commitments of approximately $6.9 million related to one of our API supply agreements covering the commercial supply of linaclotide API for the European market. During the three months ended September 30, 2015, we also recorded an incremental loss on non-cancelable API purchase commitments related to in-process API batches. We have evaluated all remaining minimum purchase commitments under our linaclotide API supply agreements through 2023 and concluded that the approximately $22.3 million of purchase commitments from the second API supply agreement covering the Japan, China, Hong Kong and Macau markets are realizable based on the current forecasts received from our partners in these territories and our internal forecasts. These charges are more fully described in Note 8, *Inventory*, to our consolidated financial statements appearing elsewhere in this Annual Report on Form 10-K.

During the year ended December 31, 2014, we wrote down approximately $20.3 million in inventory to an estimated net realizable value of approximately $5.0 million. This write down was primarily attributable to Almirall's reduced inventory demand forecasts, mainly due to the suspension of commercialization of CONSTELLA in Germany and a challenging commercial environment throughout Europe.

Research and Development Expense. The increase in research and development expense of approximately $6.9 million for the year ended December 31, 2015 compared to the year ended December 31, 2014 was primarily related to an increase of approximately $19.7 million in external costs related to the development of linaclotide; an increase of approximately $4.2 million in compensation, benefits and other employee-related expenses primarily associated with increased headcount; and an increase of approximately $3.2 million in research costs related to our early stage pipeline candidates. The increases were partially offset by a decrease of approximately $12.6 million in costs related to the collaboration with Allergan for North America; a decrease of approximately $3.0 million related to our January 2014 workforce reduction; a decrease of approximately $1.8 million in operating costs, including information technology infrastructure costs and facility costs such as rent and amortization of leasehold improvements allocated to research and development; an approximately $1.6 million decrease in costs associated with the collaboration with AstraZeneca; and a decrease of approximately $1.2 million related to the development of manufacturing processes and costs associated with linaclotide API prior to meeting our inventory capitalization policy.

Selling, General and Administrative Expense. Selling, general and administrative expenses increased approximately $6.9 million for the year ended December 31, 2015 compared to the year ended December 31, 2014 primarily as a result of an approximately $2.9 million increase in costs associated with selling expenses and marketing programs; an approximately $2.7 million increase in external consulting costs, patent-related legal costs and other service costs primarily associated with commercial activities to support linaclotide; an approximately $2.1 million increase in compensation, benefits and other employee-related expenses; and an approximately $0.4 million increase in selling, general and administrative expenses related to facilities and information technology infrastructure costs, including rent and amortization of leasehold improvements. These increases were partially offset by a decrease in costs of approximately $1.2 million related to our January 2014 workforce reduction.

Other (Expense) Income, Net

	Year Ended December 31,		Change	
	2015	2014	$	%
	(dollars in thousands)			
Other (expense) income:				
Interest expense	$(31,096)	$(21,166)	$ (9,930)	47 %
Interest and investment income	443	257	186	72 %
Loss on derivatives	(9,928)	—	(9,928)	100 %
Other income	—	661	(661)	(100)%
Total other (expense) income, net	$(40,581)	$(20,248)	$(20,333)	100 %

Interest Expense. Interest expense increased approximately $9.9 million for the year ended December 31, 2015 compared to the year ended December 31, 2014, mainly due to an increase in interest expense of approximately $10.9 million associated with our 2022 Notes. This increase was partially offset by a decrease of approximately

$0.9 million in interest expense associated with the PhaRMA Notes for the year ended December 31, 2015, and an insignificant amount due to interest associated with capital leases for the automobiles for our field-based sales force and medical science liaisons.

Loss on derivatives. The approximately $9.9 million increase in the net loss on derivatives for the year ended December 31, 2015, compared to the year ended December 31, 2014 is due to an approximately $5.4 million decrease in the fair value of the Convertible Note Hedges and an approximately $4.5 million increase in the fair value of the Note Hedge Warrants since their issuance in June 2015.

Other Income. The decrease in other income of approximately $0.7 million for the year ended December 31, 2015 compared to the year ended December 31, 2014 is primarily related to timing of the recognition of tax incentive awards that were recognized in the year ended December 31, 2014. In the year ended December 31, 2012, we were awarded an approximately $1.7 million tax incentive, associated with the Life Sciences Tax Incentive Program from the Massachusetts Life Sciences Center. During the year ended December 31, 2014, we recognized approximately $0.7 million as other income in the consolidated statement of operations, as we believed we had satisfied our job creation commitments related to this award for 2012 and 2013.

Liquidity and Capital Resources

We have incurred losses since our inception in 1998 and, as of December 31, 2016, we had an accumulated deficit of approximately $1.2 billion. We have financed our operations to date primarily through both the private sale of our preferred stock and the public sale of our common stock, including approximately $203.2 million of net proceeds from our initial public offering, or IPO, in February 2010, and approximately $413.4 million of net proceeds from our follow-on public offerings; payments received under our strategic collaborative arrangements, including up-front and milestone payments, royalties and our share of net profits, as well as reimbursement of certain expenses; and debt financings, including approximately $11.2 million of net proceeds from the private placement of our 2026 Notes, approximately $167.3 million of net proceeds from the private placement of our PhaRMA Notes in January 2013 (which we redeemed, in full, in connection with the funding in January 2017 of the 2026 Notes), and approximately $324.0 million of net proceeds from the private placement of our 2022 Notes in June 2015. At December 31, 2016, we had approximately $305.2 million of unrestricted cash, cash equivalents and available-for-sale securities. Our cash equivalents include amounts held in money market funds. Our available-for-sale securities include amounts held in U.S. Treasury securities and U.S. government-sponsored securities. We invest cash in excess of immediate requirements in accordance with our investment policy, which limits the amounts we may invest in any one type of investment and requires all investments held by us to be at least A+ rated, with a remaining maturity when purchased of less than twelve months, so as to primarily achieve liquidity and capital preservation.

During the year ended December 31, 2016, our balances of cash, cash equivalents and available-for-sale securities decreased approximately $134.2 million. This decrease is primarily due to an up-front payment of $100.0 million to AstraZeneca related to the Lesinurad License, as well as the cash used to operate our business, including payments related to, among other things, research and development and selling, general and administrative expenses as we continued to invest in our research pipeline and support the continued commercialization of LINZESS and the launch of ZURAMPIC in the U.S. We also made principal payments of approximately $26.9 million on our outstanding PhaRMA Notes, invested approximately $4.2 million in capital expenditures, and made payments of approximately $1.9 million on capital lease obligations. These cash outflows were partially offset by approximately $24.8 million in proceeds from the exercise of stock options and the issuance of shares pursuant to our employee stock purchase plan.

Cash Flows From Operating Activities

Net cash used in operating activities totaled approximately $25.4 million for the year ended December 31, 2016. The primary uses of cash were our net loss of approximately $81.7 million and changes in assets and liabilities of approximately $5.0 million resulting primarily from an increase in related party accounts receivable principally attributable to higher amounts due from Allergan as a result of increased profits on the sale of LINZESS in the U.S., a decrease in restricted cash associated with our salesforce vehicle fleet, an increase in accounts payable, related party accounts payable and accrued expenses, an increase in prepaid expenses and other assets, a decrease in deferred revenue, a decrease in deferred rent and an increase in accrued research and development costs. These uses of cash were primarily offset by non-cash items of approximately $61.3 million, including approximately $29.2 million in share-based compensation expense, approximately $14.8 million in non-cash interest expense, approximately $10.3 million in

depreciation and amortization expense of property and equipment, approximately $9.8 million due to the non-cash change in fair value of contingent consideration, approximately $3.5 million due to the loss on facility subleases, approximately $1.0 million in amortization of acquired assets, approximately $0.7 million in accretion of discounts and premiums on available for sale securities, and approximately $0.4 million in write-down of prepaid inventory; partially offset by an approximately $8.1 million due to the change in fair value of the Convertible Note Hedges and Note Hedge Warrants, and approximately $0.2 million in gain on disposal of property and equipment.

Net cash used in operating activities totaled approximately $106.9 million for the year ended December 31, 2015. The primary uses of cash were our net loss of approximately $142.7 million and changes in assets and liabilities of approximately $38.2 million resulting primarily from an increase in related party accounts receivable principally attributable to higher amounts due from Allergan as a result of increased profits on the sale of LINZESS in the U.S., an increase in restricted cash associated with our salesforce vehicle fleet, a decrease in accounts payable, related party accounts payable and accrued expenses, a decrease in prepaid expenses and other assets, a decrease in deferred revenue, a decrease in deferred rent and an increase in accrued research and development costs. These uses of cash were primarily offset by non-cash items of approximately $74.0 million, including approximately $25.5 million in share-based compensation expense, approximately $17.6 million due to the write-down of inventory to net realizable value and loss on non-cancelable purchase commitments, approximately $11.6 million in depreciation and amortization expense of property and equipment, approximately $8.1 million in non-cash interest expense, approximately $9.9 million due to the change in fair value of the Convertible Note Hedges and Note Hedge Warrants, and approximately $1.1 million in accretion of discounts and premiums on available-for-sale securities.

Net cash used in operating activities totaled approximately $155.6 million for the year ended December 31, 2014. The primary uses of cash were our net loss of approximately $189.6 million and changes in assets and liabilities of approximately $30.1 million resulting primarily from an increase in related party accounts receivable principally due to higher amounts due from Allergan due to increased profits on the sale of LINZESS in the U.S., an increase in purchases of linaclotide API, an increase in prepaid expenses and other assets, and an increase in deferred rent. These uses of cash were partially offset by non-cash items of approximately $64.2 million, including approximately $26.2 million in share-based compensation expense, approximately $20.3 million due to the write-down of inventory to net realizable value, approximately $12.3 million in depreciation and amortization expense of property and equipment, approximately $2.6 million in losses on facility subleases, approximately $1.6 million in non-cash interest expense and approximately $1.1 million in accretion of discounts and premiums on available-for-sale securities.

Cash Flows From Investing Activities

Cash used in investing activities for the year ended December 31, 2016 totaled approximately $177.7 million and resulted primarily from the costs associated with the Lesinurad License consisting of an up-front payment of $100.0 million, the purchase of approximately $311.1 million of available-for-sale securities and the purchase of approximately $4.2 million of property and equipment, primarily laboratory equipment as well as hardware and software related to our information technology infrastructure. This was partially offset by the sales and maturities of approximately $237.4 million of available-for-sale securities, and approximately $0.2 million of proceeds from the sale of property and equipment.

Cash used in investing activities for the year ended December 31, 2015 totaled approximately $9.2 million and resulted primarily from the purchase of approximately $282.0 million of available-for-sale securities and the purchase of approximately $4.0 million of property and equipment, primarily leasehold improvements and laboratory equipment. This was partially offset by the sales and maturities of approximately $276.7 million of available-for-sale securities and an insignificant amount of proceeds from the sale of property and equipment.

Cash used in investing activities for the year ended December 31, 2014 totaled approximately $56.6 million and resulted primarily from the purchase of approximately $254.0 million of available-for-sale securities and the purchase of approximately $3.5 million of property and equipment, primarily manufacturing and laboratory equipment as well as software to improve our information technology infrastructure. This was partially offset by the maturity of approximately $200.9 million in available-for-sale securities.

Cash Flows From Financing Activities

Cash used in financing activities for the year ended December 31, 2016 totaled approximately $4.2 million and resulted primarily from approximately $26.9 million in cash used for principal payments on our outstanding PhaRMA Notes, approximately $1.9 million in cash used for payments on our capital leases, and approximately $0.2 million in costs associated with the issuance of the 2026 Notes, partially offset by approximately $24.8 million in cash provided by stock option exercises and the issuance of shares under our employee stock purchase plan.

Cash provided by financing activities for the year ended December 31, 2015 totaled approximately $303.1 million and resulted primarily from approximately $324.0 million in net proceeds from the issuance of our 2022 Notes in June 2015, approximately $70.8 million in gross proceeds from the issuance of the Note Hedge Warrants in connection with the 2022 Notes, approximately $14.2 million in cash provided by stock option exercises and the issuance of shares under our employee stock purchase plan, partially offset by approximately $91.9 million related to the purchase of the Convertible Note Hedges in connection with our 2022 Notes, approximately $12.7 million in cash used for principal payments on our outstanding PhaRMA Notes, and approximately $1.3 million in cash used for payments on our capital leases.

Cash provided by financing activities for the year ended December 31, 2014 totaled approximately $210.9 million and resulted primarily from approximately $190.4 million in net proceeds from our follow-on public stock offering in the first quarter of 2014 and approximately $22.7 million in cash provided by stock option exercises and the issuance of shares under our employee stock purchase plan, partially offset by approximately $1.2 million in cash used for principal payments on debt and approximately $1.0 million in cash used for payments on our capital leases.

Funding Requirements

We began commercializing LINZESS in the U.S. with our collaboration partner, Allergan, in the fourth quarter of 2012, and we currently derive substantially all of our revenue from this collaboration. Additionally, we began commercializing ZURAMPIC in the U.S. for the treatment of uncontrolled gout in the fourth quarter of 2016. We are also deploying significant resources to advance product opportunities in IBS-C/CIC, uncontrolled gout, uncontrolled GERD, and vascular and fibrotic diseases. Our goal is to become cash flow positive, driven by increased revenue generated through sales of LINZESS and ZURAMPIC, and financial discipline. However, we have not achieved positive cash flows from operations to date.

Under our collaboration with Allergan for North America, total net sales of LINZESS in the U.S., as recorded by Allergan, are reduced by commercial costs incurred by each party, and the resulting amount is shared equally between us and Allergan. Additionally, we receive royalties from Allergan based on sales of linaclotide in its licensed territories outside of the U.S. We believe revenues from our LINZESS partnership for the U.S. with Allergan will continue to constitute a significant portion of our total revenue for the foreseeable future and we cannot be certain that such revenues, as well as the revenues from our other commercial activities including the sales of ZURAMPIC, DUZALLO (if approved) and any other products, will enable us to become cash flow positive, or to do so in the timeframes we expect. We also anticipate that we will continue to incur substantial expenses for the next several years as we further develop and commercialize linaclotide in the U.S., China and other markets, develop and commercialize lesinurad in the U.S., and continue to invest in our pipeline and potentially other external opportunities. We believe that our cash on hand as of December 31, 2016 will be sufficient to meet our projected operating needs at least through the next twelve months.

Our forecast of the period of time through which our financial resources will be adequate to support our operations, including the underlying estimates regarding the costs to develop our product candidates and obtain regulatory approvals and the costs to commercialize linaclotide in the U.S., China and other markets, and develop and commercialize lesinurad in the U.S., as well as our goal to become cash flow positive, are forward-looking statements that involve risks and uncertainties. Our actual results could vary materially and negatively from these and other

forward-looking statements as a result of a number of factors, including the factors discussed in the "Risk Factors" section of this Annual Report on Form 10-K. We have based our estimates on assumptions that may prove to be wrong, and we could utilize our available capital resources sooner than we currently expect.

Due to the numerous risks and uncertainties associated with the development and commercialization of our product candidates, we are unable to estimate precisely the amounts of capital outlays and operating expenditures necessary to develop, obtain regulatory approval for, and commercialize linaclotide, lesinurad and our other product candidates, in each case, for all of the markets, indications, populations and formulations for which we believe each is suited. Our funding requirements will depend on many factors, including, but not limited to, the following:

- the revenue generated by sales of LINZESS, CONSTELLA, ZURAMPIC and any other products;
- the rate of progress and cost of our commercialization activities, including the expense we incur in marketing and selling LINZESS, ZURAMPIC and any other products;
- the success of our third-party manufacturing activities;
- the time and costs involved in developing, and obtaining regulatory approvals for, our product candidates, as well as the timing and cost of any post-approval development and regulatory requirements;
- the success of our research and development efforts;
- the emergence of competing or complementary products;
- the costs of filing, prosecuting, defending and enforcing any patent claims and other intellectual property rights;
- the terms and timing of any additional collaborative, licensing or other arrangements that we may establish, including royalties or other payments due or payable under such agreements; and
- the acquisition of businesses, products and technologies and the impact of other strategic transactions, as well as the cost and timing of integrating any such assets into our business operations.

Financing Strategy

We may, from time to time, consider additional funding through a combination of new collaborative arrangements, strategic alliances, and additional equity and debt financings or from other sources. We will continue to manage our capital structure and to consider all financing opportunities, whenever they may occur, that could strengthen our long-term liquidity profile. Any such capital transactions may or may not be similar to transactions in which we have engaged in the past. There can be no assurance that any such financing opportunities will also be available on acceptable terms, if at all.

Contractual Commitments and Obligations

Lease and Commercial Supply Obligations

The following table summarizes our lease and commercial supply obligations at December 31, 2016 (excluding interest, except as otherwise noted):

	Payments Due by Period				
	Total	Less Than 1 Year	1 - 3 Years	3 - 5 Years	More Than 5 Years
	(in thousands)				
Commercial supply obligations[1]	$ 36,809	$ 11,417	$ 10,478	$ 11,818	$ 3,096
Capital lease obligations[2]	6,455	6,370	85	—	—
Operating lease obligations[3]	21,329	20,498	831	—	—
Total contractual obligations	$ 64,593	$ 38,285	$ 11,394	$ 11,818	$ 3,096

(1) We have multiple commercial supply agreements with contract manufacturing organizations for the purchase of linaclotide finished drug product and API. Two of our API supply agreements for supplying linaclotide API to our collaboration partners outside of North America contain minimum purchase commitments, which are reflected in the table above. As of December 31, 2016, approximately $10.1 million of the commitments included in the table above are recorded as an accrual for excess purchase commitments in our consolidated balance sheet. These commitments are more fully described in Note 12, *Commitments and Contingencies*, to our consolidated financial statements appearing elsewhere in this Annual Report on Form 10-K. In addition, we and Allergan are jointly obligated to make minimum purchases of linaclotide API for the territories covered by our collaboration with Allergan for North America. Currently, Allergan fulfills all such minimum purchase commitments and, as a result, they are excluded from the table above.

Additionally, the Lesinurad CSA with AstraZeneca provides for commercial supply and samples of ZURAMPIC, and, if approved by the FDA, DUZALLO. The Lesinurad CSA includes certain purchase obligations based on our forecasted demand for commercial product and samples. As of December 31, 2016, we had approximately $6.6 million of such commitments related to lesinurad commercial supply and samples for 2017 and none thereafter.

(2) Our commitment for capital lease obligations principally relates to leased automobiles for our field-based sales force and medical science liaisons, and computer and office equipment.

(3) Our commitments for operating leases relate to our lease of office and laboratory space in Cambridge, Massachusetts and our data storage space in Boston, Massachusetts. In the third quarter of 2014, we entered into two arrangements, with the landlord's consent, to sublease a portion of our Cambridge, Massachusetts corporate headquarters, one of which expired during 2016. The future minimum lease payments included in this table do not reflect the $6.1 million of sublease rental income that we are entitled to receive through 2018.

Notes Payable

In January 2013, we closed a private placement of $175.0 million in aggregate principal amount of 11% PhaRMA Notes due 2024. The PhaRMA Notes were redeemed on the Funding Date with proceeds from the 2026 Notes. The redemption is more fully described in Note 20, *Subsequent Events*, in the accompanying notes to our consolidated financial statements appearing elsewhere in this Annual Report on Form 10-K. The PhaRMA Notes bore an annual interest rate of 11%, with interest payable March 15, June 15, September 15 and December 15 of each year, each an 11% Payment Date, which began on June 15, 2013. On March 15, 2014, we began making quarterly payments on the notes equal to the greater of (i) 7.5% of net sales of LINZESS in the U.S. for the preceding quarter, or the 11% Synthetic Royalty Amount, and (ii) accrued and unpaid interest on the notes, or the 11% Required Interest Amount. Principal on the notes was repaid in an amount equal to the 11% Synthetic Royalty Amount minus the 11% Required Interest Amount, when this was a positive number, until the principal had been paid in full. We made principal payments of $40.7 million through December 31, 2016.

In June 2015, we issued approximately $335.7 million of 2.25% Convertible Senior Notes due June 15, 2022. The 2022 Notes are governed by an indenture between us and U.S. Bank National Association, as the trustee, or the Indenture. The 2022 Notes are senior unsecured obligations and bear interest at a rate of 2.25% per year, payable on June 15 and December 15 of each year, which began on December 15, 2015. The 2022 Notes will mature on June 15, 2022, unless earlier converted or repurchased. The initial conversion rate for the 2022 Notes is 60.3209 shares of Class A common stock (subject to adjustment as provided for in the Indenture) per $1,000 principal amount of the 2022 Notes, which is equal to an initial conversion price of approximately $16.58 per share. In addition, to minimize the impact of potential dilution to our common stock upon conversion of the 2022 Notes, we entered into the Convertible Note Hedges covering 20,249,665 shares of our Class A common stock in connection with the 2022 Notes. Concurrently with entering into the Convertible Note Hedges, we sold Note Hedge Warrants to acquire 20,249,665 shares of our Class A common stock at an initial strike price of approximately $21.50 per share, subject to customary anti-dilution adjustments. The following table summarizes our 2022 Notes obligations at December 31, 2016:

	Payments Due by Period				
	Total	Less Than 1 Year	1 - 3 Years	3 - 5 Years	More Than 5 Years
	(in thousands)				
2022 Notes (including interest)	377,242	7,553	15,106	15,106	339,476

The 2022 Notes, Convertible Note Hedges and Note Hedge Warrants are more fully described in Note 11, *Notes Payable*, in the accompanying notes to our consolidated financial statements appearing elsewhere in this Annual Report on Form 10-K.

In September 2016, we closed a direct private placement, pursuant to which we subsequently issued $150.0 million in aggregate principal amount of 8.375% notes due 2026 on the Funding Date, January 5, 2017. The proceeds from the issuance of the 2026 Notes were used to redeem the outstanding principal balance of the PhaRMA Notes. The 2026 Notes bear an annual interest rate of 8.375%, with interest payable March 15, June 15, September 15 and December 15 of each year, each an 8.375% Payment Date, which begins on June 15, 2017. Beginning March 15, 2019, we will began making quarterly payments on the 2026 Notes equal to the greater of (i) 7.5% of net sales of linaclotide in the U.S. for the preceding quarter, or the 8.375% Synthetic Royalty Amount, and (ii) accrued and unpaid interest on the notes, or the 8.375% Required Interest Amount. Principal on the 2026 Notes will be repaid in an amount equal to the 8.375% Synthetic Royalty Amount minus the 8.375% Required Interest Amount, when this is a positive number, until the principal has been paid in full. Given the principal payments on the 2026 Notes are based on the net sales of linaclotide in the U.S., which will vary from quarter to quarter, the 2026 Notes may be repaid prior to September 15, 2026, the final legal maturity date. Since we are unable to reliably estimate the exact timing and amounts of the principal payments, as discussed under "Risk Factors" in Item 1A of this Annual Report on Form 10-K, the related commitments are not included in the table above. This transaction is more fully described in Note 11, *Notes Payable*, and Note 20, *Subsequent Events*, to our consolidated financial statements appearing elsewhere in this Annual Report on Form 10 K.

Commitments Related to Our Collaboration and License Agreements

Under our collaborative agreements with Allergan for North America and AstraZeneca for China, Hong Kong and Macau, we share with Allergan and AstraZeneca all development and commercialization costs related to linaclotide in the U.S. and for China, Hong Kong and Macau, respectively. The actual amounts that we pay our partners or that partners pay to us will depend on numerous factors outside of our control, including the success of our clinical development efforts with respect to linaclotide, the content and timing of decisions made by the regulators, the reimbursement and competitive landscape around linaclotide and our other product candidates, and other factors described under "Risk Factors" in Item 1A of this Annual Report on Form 10-K.

Under our Lesinurad License, we are undertaking the development and commercialization of lesinurad in the U.S. Pursuant to the terms of the Lesinurad License, we will pay a tiered royalty to AstraZeneca in the single-digits as a percentage of net sales of ZURAMPIC, and if approved DUZALLO, in the U.S., as well as commercial and other milestones of up to $165.0 million over the duration of the agreement. Additionally, AstraZeneca is obligated to conduct certain development activities on our behalf for (i) ZURAMPIC, including the post-marketing requirement activities currently required by the FDA, for which we are obligated to reimburse AstraZeneca up to $100.0 million over up to ten years, and (ii) DUZALLO, for which we will also reimburse AstraZeneca.

In addition, we have other collaboration and license agreements that are not individually significant to our business. Under one such license and collaboration arrangement, we have commitments to make potential future milestone payments totaling $23.0 million, which includes $5.0 million for development milestones and $18.0 million for regulatory milestones. We are also committed to make potential future milestone payments of up to $114.5 million per product to one of our collaboration partners, including $21.5 million for development milestones, $58.0 million for regulatory milestones and $35.0 million for sales-based milestones. These milestones primarily include the commencement and results of clinical trials, obtaining regulatory approval in various jurisdictions and the future commercial success of development programs, the outcome and timing of which are difficult to predict and subject to significant uncertainty. In addition to the milestones discussed above, we are obligated to pay royalties on future sales, which are contingent on generating levels of sales of future products that have not been achieved and may never be achieved. Since we are unable to reliably estimate the timing and amounts of such milestone and royalty payments, or whether they will occur at all, these contingent payments have been excluded from the table above. Our license and collaboration agreements are more fully described in Note 5, *Collaboration, License, Co-promotion and Other Commercial Agreements*, in the accompanying notes to our consolidated financial statements appearing elsewhere in this Annual Report on Form 10-K.

Tax-related Obligations

We exclude liabilities or obligations pertaining to uncertain tax positions from our summary of contractual commitments and obligations as we cannot make a reliable estimate of the period of cash settlement with the respective taxing authorities. As of December 31, 2016, we have approximately $26.4 million of uncertain tax positions, and we cannot reasonably estimate the potential adjustment to our net operating loss carryforward. These uncertain tax positions are more fully described in Note 15, *Income Taxes*, in the accompanying notes to our consolidated financial statements appearing elsewhere in this Annual Report on Form 10-K.

Other Funding Commitments

As of December 31, 2016, we have several ongoing studies in various clinical trial stages. Our most significant clinical trial expenditures are to CROs. The contracts with CROs generally are cancellable, with notice, at our option and do not have any significant cancellation penalties. These items are not included in the table above.

Off-Balance Sheet Arrangements

We do not have any relationships with unconsolidated entities or financial partnerships, such as entities often referred to as structured finance or special purpose entities, that would have been established for the purpose of facilitating off-balance sheet arrangements (as that term is defined in Item 303(a)(4)(ii) of Regulation S-K) or other contractually narrow or limited purposes. As such, we are not exposed to any financing, liquidity, market or credit risk that could arise if we had engaged in those types of relationships. We enter into guarantees in the ordinary course of business related to the guarantee of our own performance and the performance of our subsidiaries.

New Accounting Pronouncements

For a discussion of new accounting pronouncements refer to Note 2, *Summary of Significant Accounting Policies*, to our consolidated financial statements appearing elsewhere in this Annual Report on Form 10-K.

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

Interest Rate Risk

We are exposed to market risk related to changes in interest rates. We invest our cash in a variety of financial instruments, principally securities issued by the U.S. government and its agencies and money market instruments. The goals of our investment policy are preservation of capital, fulfillment of liquidity needs and fiduciary control of cash and investments. We also seek to maximize income from our investments without assuming significant risk.

Our primary exposure to market risk is interest income sensitivity, which is affected by changes in the general level of interest rates, particularly because our investments are in short-term marketable securities. Due to the short-term duration of our investment portfolio and the low risk profile of our investments, an immediate 1% change in interest rates would not have a material effect on the fair market value of our portfolio. Accordingly, we would not expect our operating results or cash flows to be affected to any significant degree by the effect of a sudden change in market interest rates on our investment portfolio.

We do not believe our cash, cash equivalents and available-for-sale securities have significant risk of default or illiquidity. While we believe our cash, cash equivalents and available-for-sale securities do not contain excessive risk, we cannot provide absolute assurance that in the future our investments will not be subject to adverse changes in market value. In addition, we maintain significant amounts of cash, cash equivalents and available-for-sale securities at one or more financial institutions that are in excess of federally insured limits. Given the potential instability of financial institutions, we cannot provide assurance that we will not experience losses on these deposits.

Our capital lease obligations, 2026 Notes and 2022 Notes bear interest at a fixed rate and therefore have minimal exposure to changes in interest rates; however, because these interest rates are fixed, we may be paying a higher interest rate, relative to market, in the future if our credit rating improves or other circumstances change.

Equity Price Risk

2022 Notes

Our 2022 Notes include conversion and settlement provisions that are based on the price of our Class A common stock at conversion or at maturity of the 2022 Notes. The amount of cash we may be required to pay is determined by the price of our Class A common stock. The fair value of our 2022 Notes is dependent on the price and volatility of our Class A common stock and will generally increase or decrease as the market price of our Class A common stock changes.

The 2022 Notes are convertible into Class A common stock at an initial conversion rate of 60.3209 shares of Class A common stock (subject to adjustment as provided for in the Indenture) per $1,000 principal amount of the 2022 Notes, which is equal to an initial conversion price of approximately $16.58 per share. The 2022 Notes will mature on June 15, 2022 unless earlier converted or repurchased. The 2022 Notes bear cash interest at an annual rate of 2.25%, payable on June 15 and December 15 of each year, which began on December 15, 2015. As of December 31, 2016, the fair value of the 2022 Notes was estimated by us to be $384.2 million. The 2022 Notes are more fully described in Note 6, *Fair Value of Financial Instruments*, and Note 11, *Notes Payable*, in the accompanying notes to our consolidated financial statements appearing elsewhere in this Annual Report on Form 10-K.

Convertible Note Hedge and Warrant Transactions with Respect to 2022 Notes

To minimize the impact of potential dilution to our common stock upon conversion of the 2022 Notes, we entered into Convertible Note Hedges. Concurrently with entering into the Convertible Note Hedges, we entered into warrant transactions whereby we sold Note Hedge Warrants to acquire, subject to customary adjustments, 20,249,665 shares of our Class A common stock at an initial strike price of approximately $21.50 per share, subject to adjustment. The Convertible Note Hedges and Note Hedge Warrants are more fully described in Note 11, *Notes Payable*, in the accompanying notes to our consolidated financial statements appearing elsewhere in this Annual Report on Form 10-K.

Foreign Currency Risk

We have no significant operations outside the U.S. and we do not expect to be impacted significantly by foreign currency fluctuations.

Effects of Inflation

We do not believe that inflation and changing prices over the years ended December 31, 2016, 2015 and 2014 had a significant impact on our results of operations.

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

Our consolidated financial statements, together with the independent registered public accounting firm report thereon, appear at pages F-1 through F-58, of this Annual Report on Form 10-K.

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

None.

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

Evaluation of Disclosure Controls and Procedures

As required by Rule 13a-15(b) of the Exchange Act, our management, including our principal executive officer and our principal financial officer, conducted an evaluation as of the end of the period covered by this Annual Report on Form 10-K of the effectiveness of the design and operation of our disclosure controls and procedures. Based on that evaluation, our principal executive officer and principal financial officer concluded that our disclosure controls and procedures are effective at the reasonable assurance level in ensuring that information required to be disclosed by us in the reports that we file or submit under the Exchange Act is recorded, processed, summarized and reported within the

time periods specified in the SEC's rules and forms. Disclosure controls and procedures include, without limitation, controls and procedures designed to ensure that information required to be disclosed by us in the reports we file under the Exchange Act 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.

Management's Report on Internal Control Over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over our financial reporting. Internal control over financial reporting is defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act as the process designed by, or under the supervision of, our Chief Executive Officer and Chief Financial Officer, and effected by our board of directors, management and other personnel, to provide reasonable assurance regarding the reliability of our financial reporting and the preparation of our financial statements for external purposes in accordance with generally accepted accounting principles, and 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 assets;

(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 are being made only in accordance with the authorizations of management and directors; and

(3) provide reasonable assurance regarding the prevention or timely detection of unauthorized acquisition, use or disposition of assets that could have a material effect on our financial statements.

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 framework provided in *Internal Control—Integrated Framework* issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework). Based on this evaluation, our management concluded that our internal control over financial reporting was effective as of December 31, 2016.

The effectiveness of our internal control over financial reporting as of December 31, 2016 has been audited by Ernst and Young LLP, an independent registered public accounting firm, as stated in their report, which is included herein.

Changes in Internal Control

As required by Rule 13a-15(d) of the Exchange Act, our management, including our principal executive officer and our principal financial officer, conducted an evaluation of the internal control over financial reporting to determine whether any changes occurred during the quarter ended December 31, 2016 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting. Based on that evaluation, our principal executive officer and principal financial officer concluded no such changes during the quarter ended December 31, 2016 materially affected, or were reasonably likely to materially affect, our internal control over financial reporting.

Report of Independent Registered Public Accounting Firm

The Board of Directors and Shareholders of Ironwood Pharmaceuticals, Inc.

We have audited Ironwood Pharmaceuticals, Inc.'s internal control over financial reporting as of December 31, 2016, based on criteria established in Internal Control—Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) (the COSO criteria). Ironwood Pharmaceuticals, Inc.'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 conducted our audit in accordance with the standards of the Public Company Accounting Oversight Board (United States). 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 included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

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.

In our opinion, Ironwood Pharmaceuticals, Inc. maintained, in all material respects, effective internal control over financial reporting as of December 31, 2016, based on the COSO criteria.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States), the consolidated balance sheets of Ironwood Pharmaceuticals, Inc. as of December 31, 2016 and 2015, and the related consolidated statements of operations, comprehensive loss, stockholders' equity, and cash flows for each of the three years in the period ended December 31, 2016 of Ironwood Pharmaceuticals, Inc. and our report dated February 22, 2017 expressed an unqualified opinion thereon.

/s/ Ernst & Young LLP

Boston, Massachusetts
February 22, 2017

Item 9B. ***Other Information***

None.

PART III

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

We have adopted a code of business conduct and ethics applicable to our directors, executive officers and all other employees. A copy of that code is available on our corporate website at http://www.ironwoodpharma.com. Any amendments to the code of business conduct and ethics, and any waivers thereto involving our executive officers, also will be available on our corporate website. A printed copy of these documents will be made available upon request. The content on our website is not incorporated by reference into this Annual Report on Form 10-K.

Certain information regarding our executive officers is set forth at the end of Part I, Item 1 of this Form 10-K under the heading, "Executive Officers of the Registrant." The other information required by this item is incorporated by reference from our proxy statement for our 2017 Annual Meeting of Stockholders.

Item 11. *Executive Compensation*

The information required by this item is incorporated by reference from our proxy statement for our 2017 Annual Meeting of Stockholders.

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

The information relating to security ownership of certain beneficial owners of our common stock and information relating to the security ownership of our management required by this item is incorporated by reference from our proxy statement for our 2017 Annual Meeting of Stockholders.

The table below sets forth information with regard to securities authorized for issuance under our equity compensation plans as of December 31, 2016. As of December 31, 2016, we had four active equity compensation plans, each of which was approved by our stockholders:

- Our Amended and Restated 2002 Stock Incentive Plan;
- Our Amended and Restated 2005 Stock Incentive Plan;
- Our Amended and Restated 2010 Employee, Director and Consultant Equity Incentive Plan; and
- Our Amended and Restated 2010 Employee Stock Purchase Plan.

Plan Category	Number of securities to be issued upon exercise of outstanding options, warrants and rights (1)	Weighted-average exercise price of outstanding options, warrants, and rights (2)	Number of securities remaining available for future issuance under equity compensation plans (excluding securities reflected in column (a))
	(a)	(b)	(c)
Equity compensation plans approved by security holders	21,754,116	11.92	12,959,613
Equity compensation plans not approved by security holders	—	—	—
Total	21,754,116	$ 11.92	12,959,613

(1) Amount includes the number of shares subject to issuance upon exercise of 20,454,659 outstanding stock options and vesting of 1,299,457 restricted stock units.
(2) Amount includes all outstanding stock options but does not include restricted stock units, which do not have an exercise price.

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

The information required by this item is incorporated by reference from our proxy statement for our 2017 Annual Meeting of Stockholders.

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

The information required by this item is incorporated by reference from our proxy statement for our 2017 Annual Meeting of Stockholders.

PART IV

Item 15. ***Exhibits and Financial Statement Schedules***

1. List of documents filed as part of this report

    1. Consolidated Financial Statements listed under Part II, Item 8 and included herein by reference.

    2. Consolidated Financial Statement Schedules

        No schedules are submitted because they are not applicable, not required or because the information is included in the Consolidated Financial Statements or Notes to Consolidated Financial Statements.

    3. Exhibits

		Incorporated by reference herein	
Number	**Description**	**Form**	**Date**
3.1	Eleventh Amended and Restated Certificate of Incorporation	Annual Report on Form 10-K (File No. 001-34620)	March 30, 2010
3.2	Fifth Amended and Restated Bylaws	Annual Report on Form 10-K (File No. 001-34620)	March 30, 2010
4.1	Specimen Class A common stock certificate	Registration Statement on Form S-1, as amended (File No. 333-163275)	January 20, 2010
4.2	Eighth Amended and Restated Investors' Rights Agreement, dated as of September 1, 2009, by and among Ironwood Pharmaceuticals, Inc., the Founders and the Investors named therein	Registration Statement on Form S-1, as amended (File No. 333-163275)	November 20, 2009
4.3	Indenture, dated as of June 15, 2015, by and between Ironwood Pharmaceuticals, Inc. and U. S. Bank National Association (including the form of the 2.25% Convertible Senior Note due 2022)	Form 8-K (File No. 001-34620)	June 15, 2015
4.4	Indenture, dated as of September 23, 2016, by and between Ironwood Pharmaceuticals, Inc. and U.S. Bank National Association (including the form of the 8.375% Notes due 2026)	Form 8-K (File No. 001-34620)	September 26, 2016
10.1#	Amended and Restated 2002 Stock Incentive Plan and form agreements thereunder	Registration Statement on Form S-1, as amended (File No. 333-163275)	December 23, 2009
10.2#	Amended and Restated 2005 Stock Incentive Plan and form agreements thereunder	Registration Statement on Form S-1, as amended (File No. 333-163275)	January 29, 2010
10.3#	Amended and Restated 2010 Employee, Director and Consultant Equity Incentive Plan	Registration Statement on Form S-8, as amended (File No. 333-184396)	October 12, 2012

Number	Description	Incorporated by reference herein	
		Form	Date
10.3.1#	Form of Stock Option Agreement under the Amended and Restated 2010 Employee, Director and Consultant Equity Incentive Plan	Annual Report on Form 10-K (File No. 001-34620)	February 18, 2015
10.3.2#	Form of Non-employee Director Restricted Stock Agreement under the Amended and Restated 2010 Employee, Director and Consultant Equity Incentive Plan	Annual Report on Form 10-K (File No. 001-34620)	February 18, 2015
10.3.3#	Form of Restricted Stock Unit Agreement under the Amended and Restated 2010 Employee, Director and Consultant Equity Incentive Plan	Annual Report on Form 10-K (File No. 001-34620)	February 18, 2015
10.4#	Amended and Restated 2010 Employee Stock Purchase Plan	Annual Report on Form 10-K (File No. 001-34620)	February 21, 2013
10.5#	Change of Control Severance Benefit Plan, as amended and restated	Quarterly Report on Form 10-Q (File No. 001-34620)	April 29, 2014
10.6#	Form of Executive Severance Agreement	Annual Report on Form 10-K (File No. 001-34620)	February 18, 2015
10.7#	Director Compensation Plan effective January 1, 2014	Annual Report on Form 10-K (File No. 001-34620)	February 7, 2014
10.8#	Form of Indemnification Agreement with Directors and Officers	Registration Statement on Form S-1, as amended (File No. 333-163275)	December 23, 2009
10.9#	Consulting Agreement, dated as of December 16, 2014, by and between Christopher Walsh and Ironwood Pharmaceuticals, Inc.	Annual Report on Form 10-K (File No. 001-34620)	February 18, 2015
10.10#	Consulting Agreement, dated December 3, 2014, by and between Lawrence S. Olanoff and Ironwood Pharmaceuticals, Inc.	Quarterly Report on Form 10-Q (File No. 001-34620)	May 6, 2015
10.11+	Collaboration Agreement, dated as of September 12, 2007, as amended on November 3, 2009, by and between Forest Laboratories, Inc. and Ironwood Pharmaceuticals, Inc.	Registration Statement on Form S-1, as amended (File No. 333-163275)	February 2, 2010
10.11.1	Amendment No. 2 to the Collaboration Agreement, dated as of January 8, 2013, by and between Forest Laboratories, Inc. and Ironwood Pharmaceuticals, Inc.	Annual Report on Form 10-K (File No. 001-34620)	February 21, 2013
10.12+	License Agreement, dated as of April 30, 2009, by and between Allergan Pharmaceuticals International Ltd. (formerly with Almirall, S.A.) and Ironwood Pharmaceuticals, Inc.	Registration Statement on Form S-1, as amended (File No. 333-163275)	February 2, 2010

Number	Description	Incorporated by reference herein	
		Form	Date
10.12.1+	Amendment No. 1 to License Agreement, dated as of June 11, 2013, by and between Allergan Pharmaceuticals International Ltd. (formerly with Almirall, S.A.) and Ironwood Pharmaceuticals, Inc.	Quarterly Report on Form 10-Q (File No. 001-34620)	August 8, 2013
10.12.2+	Amendment to the License Agreement, dated as of October 26, 2015, by and between Allergan Pharmaceuticals International Ltd. and Ironwood Pharmaceuticals, Inc.	Annual Report on Form 10-K (File No. 001-34620)	February 19, 2016
10.13+	Novation Agreement, dated as of October 26, 2015, by and among Almirall, S.A., Allergan Pharmaceuticals International Ltd. and Ironwood Pharmaceuticals, Inc.	Annual Report on Form 10-K (File No. 001-34620)	February 19, 2016
10.14+	License Agreement, dated as of November 10, 2009, by and among Astellas Pharma Inc. and Ironwood Pharmaceuticals, Inc.	Registration Statement on Form S-1, as amended (File No. 333-163275)	February 2, 2010
10.15+	Collaboration Agreement, dated as of October 23, 2012, by and between AstraZeneca AB and Ironwood Pharmaceuticals, Inc.	Annual Report on Form 10-K (File No. 001-34620)	February 21, 2013
10.16+	License Agreement, dated as of April 26, 2016, by and between Ardea Biosciences, Inc. and Ironwood Pharmaceuticals, Inc	Quarterly Report on Form 10-Q (File No. 001-34620)	August 8, 2016
10.17+	Commercial Supply Agreement, dated as of June 23, 2010, by and among PolyPeptide Laboratories, Inc. and Polypeptide Laboratories (SWEDEN) AB, Forest Laboratories, Inc. and Ironwood Pharmaceuticals, Inc.	Quarterly Report on Form 10-Q (File No. 001-34620)	August 10, 2010
10.18+	Commercial Supply Agreement, dated as of March 28, 2011, by and among Corden Pharma Colorado, Inc. (f/k/a Roche Colorado Corporation), Ironwood Pharmaceuticals, Inc. and Forest Laboratories, Inc.	Quarterly Report on Form 10-Q (File No. 001-34620)	May 13, 2011
10.18.1+	Amendment No. 3 to Commercial Supply Agreement, dated as of November 26, 2013, by and between Corden Pharma Colorado, Inc. (f/k/a Roche Colorado Corporation), Ironwood Pharmaceuticals, Inc. and Forest Laboratories, Inc.	Annual Report on Form 10-K (File No. 001-34620)	February 7, 2014

Number	Description	Incorporated by reference herein	
		Form	Date
10.19+	Commercial Supply Agreement, dated as of April 26, 2016, by and between AstraZeneca Pharmaceuticals LP and Ironwood Pharmaceuticals, Inc.	Quarterly Report on Form 10-Q (File No. 001-34620)	August 8, 2016
10.20	Lease for facilities at 301 Binney St., Cambridge, MA, dated as of January 12, 2007, as amended on April 9, 2009, by and between Ironwood Pharmaceuticals, Inc. and BMR-Rogers Street LLC	Registration Statement on Form S-1, as amended (File No. 333-163275)	December 23, 2009
10.20.1	Second Amendment to Lease for facilities at 301 Binney St., Cambridge, MA, dated as of February 9, 2010, by and between Ironwood Pharmaceuticals, Inc. and BMR-Rogers Street LLC	Annual Report on Form 10-K (File No. 001-34620)	March 30, 2010
10.20.2	Third Amendment to Lease for facilities at 301 Binney St., Cambridge, MA, dated as of July 1, 2010, by and between Ironwood Pharmaceuticals, Inc. and BMR-Rogers Street LLC	Annual Report on Form 10-K (File No. 001-34620)	March 30, 2011
10.20.3	Fourth Amendment to Lease for facilities at 301 Binney St., Cambridge, MA, dated as of February 3, 2011, by and between Ironwood Pharmaceuticals, Inc. and BMR-Rogers Street LLC	Annual Report on Form 10-K (File No. 001-34620)	March 30, 2011
10.20.4	Fifth Amendment to Lease for facilities at 301 Binney St., Cambridge, MA, dated as of October 18, 2011, by and between Ironwood Pharmaceuticals, Inc. and BMR-Rogers Street LLC	Annual Report on Form 10-K (File No. 001-34620)	February 29, 2012
10.20.5	Sixth Amendment to Lease for facilities at 301 Binney St., Cambridge, MA, dated as of July 19, 2012, by and between Ironwood Pharmaceuticals, Inc. and BMR-Rogers Street LLC	Annual Report on Form 10-K (File No. 001-34620)	February 21, 2013
10.20.6	Seventh Amendment to Lease for facilities at 301 Binney St., Cambridge, MA, dated as of October 30, 2012, by and between Ironwood Pharmaceuticals, Inc. and BMR-Rogers Street LLC	Annual Report on Form 10-K (File No. 001-34620)	February 21, 2013
10.20.7	Eighth Amendment to Lease for facilities at 301 Binney St., Cambridge, MA, dated as of July 8, 2014, by and between Ironwood Pharmaceuticals, Inc. and BMR-Rogers Street LLC	Annual Report on Form 10-K (File No. 001-34620)	February 18, 2015

Number	Description	Incorporated by reference herein	
		Form	Date
10.20.8	Ninth Amendment to Lease for facilities at 301 Binney St., Cambridge, MA, dated as of October 27, 2014, by and between Ironwood Pharmaceuticals, Inc. and BMR-Rogers Street LLC	Annual Report on Form 10-K (File No. 001-34620)	February 18, 2015
10.20.9	Tenth Amendment to Lease for facilities at 301 Binney St., Cambridge, MA, dated as of January 21, 2015, by and between Ironwood Pharmaceuticals, Inc. and BMR-Rogers Street LLC	Annual Report on Form 10-K (File No. 001-34620)	February 18, 2015
10.20.10*	Eleventh Amendment to Lease for facilities at 301 Binney St., Cambridge, MA, dated as of June 30, 2016, by and between Ironwood Pharmaceuticals, Inc. and BMR-Rogers Street LLC		
10.20.11	Sublease, dated as of July 1, 2014, by and between Biogen Idec MA Inc. and Ironwood Pharmaceuticals, Inc. to Lease for facilities at 301 Binney St., Cambridge, MA, as amended, by and between Ironwood Pharmaceuticals, Inc. and BMR-Rogers Street LLC	Annual Report on Form 10-K (File No. 001-34620)	February 18, 2015
10.21	Base Call Option Transaction Confirmation, dated as of June 10, 2015, between Ironwood Pharmaceuticals, Inc. and JPMorgan Chase Bank, National Association, London Branch	Quarterly Report on Form 10-Q (File No. 001-34620)	August 7, 2015
10.22	Base Call Option Transaction Confirmation, dated as of June 10, 2015, between Ironwood Pharmaceuticals, Inc. and Credit Suisse Capital LLC, through its agent Credit Suisse Securities (USA) LLC	Quarterly Report on Form 10-Q (File No. 001-34620)	August 7, 2015
10.23	Base Warrants Confirmation, dated as of June 10, 2015, between Ironwood Pharmaceuticals, Inc. and JPMorgan Chase Bank, National Association, London Branch	Quarterly Report on Form 10-Q (File No. 001-34620)	August 7, 2015
10.24	Base Warrants Confirmation, dated as of June 10, 2015, between Ironwood Pharmaceuticals, Inc. and Credit Suisse Capital LLC, through its agent Credit Suisse Securities (USA) LLC	Quarterly Report on Form 10-Q (File No. 001-34620)	August 7, 2015
10.25	Additional Call Option Transaction Confirmation, dated as of June 22, 2015, between Ironwood Pharmaceuticals, Inc. and JPMorgan Chase Bank, National Association, London Branch	Quarterly Report on Form 10-Q (File No. 001-34620)	August 7, 2015

Number	Description	Incorporated by reference herein	
		Form	Date
10.26	Additional Call Option Transaction Confirmation, dated as of June 22, 2015, between Ironwood Pharmaceuticals, Inc. and Credit Suisse Capital LLC, through its agent Credit Suisse Securities (USA) LLC	Quarterly Report on Form 10-Q (File No. 001-34620)	August 7, 2015
10.27	Additional Warrants Confirmation, dated as of June 22, 2015, between Ironwood Pharmaceuticals, Inc. and JPMorgan Chase Bank, National Association, London Branch	Quarterly Report on Form 10-Q (File No. 001-34620)	August 7, 2015
10.28	Additional Warrants Confirmation, dated as of June 22, 2015, between Ironwood Pharmaceuticals, Inc. and Credit Suisse Capital LLC, through its agent Credit Suisse Securities (USA) LLC	Quarterly Report on Form 10-Q (File No. 001-34620)	August 7, 2015
21.1*	Subsidiaries of Ironwood Pharmaceuticals, Inc.		
23.1*	Consent of Independent Registered Public Accounting Firm		
31.1*	Certification of Chief Executive Officer pursuant to Rules 13a-14 or 15d-14 of the Exchange Act		
31.2*	Certification of Chief Financial Officer pursuant to Rules 13a-14 or 15d-14 of the Exchange Act		
32.1‡	Certification of Chief Executive Officer pursuant to Rules 13a-14(b) or 15d-14(b) of the Exchange Act and 18 U.S.C. Section 1350		
32.2‡	Certification of Chief Financial Officer pursuant to Rules 13a-14(b) or 15d-14(b) of the Exchange Act and 18 U.S.C. Section 1350		
101.INS*	XBRL Instance Document		
101.SCH*	XBRL Taxonomy Extension Schema Document		
101.CAL*	XBRL Taxonomy Extension Calculation Linkbase Document		
101.LAB*	XBRL Taxonomy Extension Label Linkbase Database		
101.PRE*	XBRL Taxonomy Extension Presentation Linkbase Document		
101.DEF*	XBRL Taxonomy Extension Definition Linkbase Document		

* Filed herewith.

‡ Furnished herewith.

+ Confidential treatment granted under 17 C.F.R. §§200.80(b)(4) and 230.406. The confidential portions of this exhibit have been omitted and are marked accordingly. The confidential portions have been provided separately to the SEC pursuant to the confidential treatment request.

Management contract or compensatory plan, contract, or arrangement.

(b) Exhibits.

The exhibits required by this Item are listed under Item 15(a)(3).

(c) Financial Statement Schedules.

The financial statement schedules required by this Item are listed under Item 15(a)(2).

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, in the City of Cambridge, Commonwealth of Massachusetts, on the 22nd day of February 2017.

Ironwood Pharmaceuticals, Inc.
By: /s/ Peter M. Hecht
Peter M. Hecht
Chief Executive Officer

Pursuant to the requirements of Section 13 or 15(d) 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 date indicated.

Signature	Title	Date
/s/ Peter M. Hecht Peter M. Hecht	Chief Executive Officer and Director (Principal Executive Officer)	February 22, 2017
/s/ Thomas Graney Thomas Graney	Chief Financial Officer (Principal Financial Officer)	February 22, 2017
/s/ Gina Consylman Gina Consylman	Vice President, Finance and Chief Accounting Officer (Principal Accounting Officer)	February 22, 2017
/s/ Terrance G. McGuire Terrance G. McGuire	Chairman of the Board	February 22, 2017
/s/ Andrew Dreyfus Andrew Dreyfus	Director	February 22, 2017
/s/ Marsha H. Fanucci Marsha H. Fanucci	Director	February 22, 2017
/s/ Julie H. McHugh Julie H. McHugh	Director	February 22, 2017
/s/ Lawrence S. Olanoff Lawrence S. Olanoff	Director	February 22, 2017
/s/ Edward P. Owens Edward P. Owens	Director	February 22, 2017
/s/ Amy W. Schulman Amy W. Schulman	Director	February 22, 2017
/s/ Christopher T. Walsh Christopher T. Walsh	Director	February 22, 2017
/s/ Douglas E. Williams Douglas E. Williams	Director	February 22, 2017

Index to Consolidated Financial Statements of
Ironwood Pharmaceuticals, Inc.

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Board of Directors and Shareholders of
Ironwood Pharmaceuticals, Inc.

We have audited the accompanying consolidated balance sheets of Ironwood Pharmaceuticals, Inc. as of December 31, 2016 and 2015, and the related consolidated statements of operations, comprehensive loss, stockholders' equity, and cash flows for each of the three years in the period ended December 31, 2016. These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these financial statements based on our audits.

We conducted our audits in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the financial statements referred to above present fairly, in all material respects, the consolidated financial position of Ironwood Pharmaceuticals, Inc. at December 31, 2016 and 2015, and the consolidated results of its operations and its cash flows for each of the three years in the period ended December 31, 2016, 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), Ironwood Pharmaceuticals, Inc.'s internal control over financial reporting as of December 31, 2016, based on criteria established in Internal Control—Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) and our report dated February 22, 2017 expressed an unqualified opinion thereon.

/s/ Ernst & Young LLP

Boston, Massachusetts
February 22, 2017

Ironwood Pharmaceuticals, Inc.
Consolidated Balance Sheets
(In thousands, except share and per share amounts)

	December 31, 2016	December 31, 2015
ASSETS		
Current assets:		
Cash and cash equivalents	$ 54,004	$ 261,287
Available-for-sale securities	251,212	178,107
Accounts receivable	933	2,884
Related party accounts receivable, net	63,921	51,634
Inventory	1,081	—
Prepaid expenses and other current assets	9,030	6,293
Total current assets	380,181	500,205
Restricted cash	8,247	8,747
Property and equipment, net	20,512	21,075
Convertible note hedges	132,521	86,466
Intangible assets, net	166,119	—
Goodwill	785	—
Other assets	1,456	2,628
Total assets	$ 709,821	$ 619,121
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	$ 17,702	$ 8,586
Related party accounts payable, net	1	3
Accrued research and development costs	6,937	4,245
Accrued expenses and other current liabilities	38,301	23,301
Current portion of capital lease obligations	6,227	2,631
Current portion of deferred rent	7,719	5,544
Current portion of deferred revenue	—	7,191
Current portion of PhaRMA notes payable	—	24,964
Current portion of contingent consideration	14,244	—
Total current liabilities	91,131	76,465
Capital lease obligations, net of current portion	82	306
Deferred rent, net of current portion	557	6,395
Deferred revenue, net of current portion	—	1,798
Contingent consideration, net of current portion	63,416	—
Note hedge warrants	113,237	75,328
Convertible senior notes	234,243	220,620
PhaRMA notes payable, net of current portion	132,249	132,964
Other liabilities	8,190	10,120
Commitments and contingencies		
Stockholders' equity:		
Preferred stock, $0.001 par value, 75,000,000 shares authorized, no shares issued and outstanding	—	—
Class A common stock, $0.001 par value, 500,000,000 shares authorized and 132,631,387 and 127,371,478 shares issued and outstanding at December 31, 2016 and December 31, 2015, respectively	133	127
Class B common stock, $0.001 par value, 100,000,000 shares authorized and 14,784,077 shares issued, 14,484,077 shares outstanding, and 15,870,356 shares issued and outstanding at December 31, 2016 and December 31, 2015, respectively	15	16
Additional paid-in capital	1,258,398	1,205,183
Accumulated deficit	(1,191,823)	(1,110,115)
Accumulated other comprehensive loss	(7)	(86)
Total stockholders' equity	66,716	95,125
Total liabilities and stockholders' equity	$ 709,821	$ 619,121

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

Ironwood Pharmaceuticals, Inc.

Consolidated Statements of Operations

(In thousands, except per share amounts)

	Years Ended December 31,		
	2016	2015	2014
Collaborative arrangements revenue	$ 273,957	$ 149,555	$ 76,436
Cost and expenses:			
Cost of revenues, excluding amortization of acquired intangible asset	1,868	12	5,291
Write-down of inventory to net realizable value and loss on non-cancellable purchase commitments	374	17,638	20,292
Research and development	139,492	108,746	101,890
Selling, general and administrative	173,281	125,247	118,333
Amortization of acquired intangible asset	981	—	—
Loss on fair value remeasurement of contingent consideration	9,831	—	—
Total cost and expenses	325,827	251,643	245,806
Loss from operations	(51,870)	(102,088)	(169,370)
Other (expense) income:			
Interest expense	(39,153)	(31,096)	(21,166)
Interest and investment income	1,169	443	257
Gain (loss) on derivatives	8,146	(9,928)	—
Other income	—	—	661
Other expense, net	(29,838)	(40,581)	(20,248)
Net loss	$ (81,708)	$(142,669)	$(189,618)
Net loss per share—basic and diluted	$ (0.56)	$ (1.00)	$ (1.39)
Weighted average number of common shares used in net loss per share—basic and diluted:	144,928	142,155	136,811

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

Ironwood Pharmaceuticals, Inc.

Consolidated Statements of Comprehensive Loss

(In thousands)

	Years Ended December 31,		
	2016	2015	2014
Net loss	$(81,708)	$(142,669)	$(189,618)
Other comprehensive income (loss):			
Unrealized gains (losses) on available-for-sale securities	79	(67)	(21)
Total other comprehensive income (loss)	79	(67)	(21)
Comprehensive loss	$(81,629)	$(142,736)	$(189,639)

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

Ironwood Pharmaceuticals, Inc.

Consolidated Statements of Stockholders' Equity

(In thousands, except share amounts)

	Class A common stock		Class B common stock		Additional paid-in capital	Accumulated deficit	Accumulated other comprehensive income (loss)	Total Stockholders' equity
	Shares	Amount	Shares	Amount				
Balance at December 31, 2013	102,803,093	$ 103	18,362,037	$ 18	$ 815,930	$ (777,828)	$ 2	$ 38,225
Issuance of common stock upon exercise of stock options and employee stock purchase plan	1,705,752	2	1,876,880	2	23,328	—	—	23,332
Issuance of common stock awards	290,843	—	—	—	22	—	—	22
Issuance of common stock upon public offering, net of offering costs of $10.8 million	15,784,325	16	—	—	190,412	—	—	190,428
Conversion of Class B common stock to Class A common stock	4,331,645	4	(4,331,645)	(4)	—	—	—	—
Share-based compensation expense related to issuance of stock options to non-employees	—	—	—	—	2,618	—	—	2,618
Share-based compensation expense related to share-based awards to employees and employee stock purchase plan	—	—	—	—	23,566	—	—	23,566
Restricted common shares subject to repurchase	—	—	—	—		—	—	
Unrealized losses on available-for-sale securities	—	—	—	—	—	—	(21)	(21)
Net loss	—	—	—	—	—	(189,618)	—	(189,618)
Balance at December 31, 2014	124,915,658	125	15,907,272	16	1,055,876	(967,446)	(19)	88,552
Issuance of common stock upon exercise of stock options and employee stock purchase plan	972,325	1	1,293,032	1	13,619	—	—	13,621
Issuance of common stock awards	153,547	—	—	—	24	—	—	24
Conversion of Class B common stock to Class A common stock	1,329,948	1	(1,329,948)	(1)	—	—	—	—
Share-based compensation expense related to share-based awards to employees and employee stock purchase plan	—	—	—	—	25,448	—	—	25,448
Equity component of convertible debt	—	—	—	—	114,199	—	—	114,199
Equity component of deferred financing costs for convertible debt	—	—	—	—	(3,983)	—	—	(3,983)
Unrealized losses on available-for-sale securities	—	—	—	—	—	—	(67)	(67)
Net loss	—	—	—	—	—	(142,669)	—	(142,669)
Balance at December 31, 2015	127,371,478	127	15,870,356	16	1,205,183	(1,110,115)	(86)	95,125
Issuance of common stock upon exercise of stock options and employee stock purchase plan	1,813,018	3	1,867,111	2	23,996	—	—	24,001
Issuance of common stock awards	193,501	—	—	—	20	—	—	20
Conversion of Class B common stock to Class A common stock	3,253,390	3	(3,253,390)	(3)	—	—	—	—
Share-based compensation expense related to share-based awards to non-employees	—	—	—	—	529	—	—	529
Share-based compensation expense related to share-based awards to employees and employee stock purchase plan	—	—	—	—	28,670	—	—	28,670
Unrealized gains on available-for-sale securities	—	—	—	—	—	—	79	79
Net loss	—	—	—	—	—	(81,708)	—	(81,708)
Balance at December 31, 2016	132,631,387	$ 133	14,484,077	$ 15	$1,258,398	$(1,191,823)	$ (7)	$ 66,716

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

Ironwood Pharmaceuticals, Inc.

Consolidated Statements of Cash Flows

(In thousands)

	Year Ended December 31,		
	2016	2015	2014
Cash flows from operating activities:			
Net loss	$ (81,708)	$ (142,669)	$ (189,618)
Adjustments to reconcile net loss to net cash used in operating activities:			
Depreciation and amortization	10,279	11,630	12,331
Amortization of acquired intangible asset	981	—	—
(Gain) loss on disposal of property and equipment	(204)	(196)	119
Share-based compensation expense	29,219	25,469	26,184
Change in fair value of note hedge warrants	37,909	4,479	—
Change in fair value of convertible note hedges	(46,055)	5,449	—
Write-down of inventory to net realizable value and loss on non-cancellable purchase commitments	374	17,638	20,292
Loss on facility subleases	3,480	296	2,573
Accretion of discount/premium on investment securities	667	1,114	1,085
Non-cash interest expense	14,812	8,102	1,566
Non-cash change in fair value of contingent consideration	9,831	—	—
Changes in assets and liabilities:			
Accounts receivable and related party accounts receivable	(10,336)	(28,679)	(23,680)
Restricted cash	500	(600)	—
Prepaid expenses and other current assets	(3,069)	2,568	(3,947)
Inventory	—	—	(3,078)
Other assets	1,644	414	(2,876)
Accounts payable, related party accounts payable and accrued expenses	19,683	(1,551)	1,425
Accrued research and development costs	2,692	671	162
Deferred revenue	(8,989)	(7,191)	744
Deferred rent	(7,143)	(3,871)	1,811
Other liabilities	—	—	(661)
Net cash used in operating activities	(25,433)	(106,927)	(155,568)
Cash flows from investing activities:			
Purchases of available-for-sale securities	(311,116)	(281,958)	(253,995)
Sales and maturities of available-for-sale securities	237,423	276,707	200,964
Purchases of property and equipment	(4,206)	(4,049)	(3,538)
Payment for acquisition of lesinurad license	(100,000)	—	—
Proceeds from sale of property and equipment	225	147	—
Net cash used in investing activities	(177,674)	(9,153)	(56,569)
Cash flows from financing activities:			
Proceeds from issuance of convertible senior notes	—	335,699	—
Proceeds from issuance of common stock	—	—	190,428
Costs associated with issuance of 2026 notes	(246)	—	—
Proceeds from issuance of note hedge warrants	—	70,849	—
Purchase of convertible note hedges	—	(91,915)	—
Costs associated with issuance of convertible senior notes	—	(11,730)	—
Proceeds from exercise of stock options and employee stock purchase plan	24,841	14,196	22,741
Payments on capital leases	(1,903)	(1,317)	(1,062)
Principal payments on PhaRMA notes	(26,868)	(12,712)	(1,163)
Net cash (used in) provided by financing activities	(4,176)	303,070	210,944
Net (decrease) increase in cash and cash equivalents	(207,283)	186,990	(1,193)
Cash and cash equivalents, beginning of period	261,287	74,297	75,490
Cash and cash equivalents, end of period	$ 54,004	$ 261,287	$ 74,297
Supplemental cash flow disclosure:			
Cash paid for interest	$ 24,473	$ 22,742	$ 19,606
Non-cash investing activities			
Contingent consideration	$ 67,885	$ —	$ —
Purchases under capital leases	$ 6,277	$ 2,957	$ 766
Disposals under capital leases	$ (1,001)	$ (2,529)	$ —
Fixed asset purchases in accounts payable and accrued expenses	$ 353	$ 98	$ 1,592

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

Ironwood Pharmaceuticals, Inc.

Notes to Consolidated Financial Statements

1. Nature of Business

Ironwood Pharmaceuticals, Inc. (the "Company") is a commercial biotechnology company leveraging its proven development and commercial capabilities as it seeks to bring multiple medicines to patients. The Company is advancing innovative product opportunities in areas of large unmet need, including irritable bowel syndrome with constipation ("IBS-C"), and chronic idiopathic constipation ("CIC"), hyperuricemia associated with uncontrolled gout, uncontrolled gastroesophageal reflux disease ("uncontrolled GERD"), and vascular and fibrotic diseases.

The Company's first commercial product, linaclotide, is available to adult men and women suffering from IBS-C or CIC in the United States (the "U.S."), under the trademarked name LINZESS®, and is available to adult men and women suffering from IBS-C in certain European countries under the trademarked name CONSTELLA®. The Company and its U.S. partner Allergan plc (together with its affiliates, "Allergan"), began commercializing LINZESS in the U.S. in December 2012. Under the Company's collaboration with Allergan for North America, total net sales of LINZESS in the U.S., as recorded by Allergan, are reduced by commercial costs incurred by each party, and the resulting amount is shared equally between the Company and Allergan. The Company's former European partner, Almirall, S.A. ("Almirall"), began commercializing CONSTELLA in Europe for the symptomatic treatment of moderate to severe IBS-C in adults in the second quarter of 2013. In October 2015, Almirall transferred its exclusive license to develop and commercialize linaclotide in Europe to Allergan, and the Company and Allergan entered into an amendment to the European license agreement. Currently, CONSTELLA is commercially available in a number of European countries, including the United Kingdom, Italy and Spain. In January 2017, the Company and Allergan entered into an amendment to the European license agreement, pursuant to which the license granted to Allergan was extended to a territory consisting of all countries worldwide not previously covered by the European license agreement, other than China, Hong Kong, Macau, Japan, and the countries and territories of North America. On a country-by-country and product-by-product basis in such additional territory, Allergan will pay the Company an annual royalty as a percentage of net sales of products containing linaclotide as an active ingredient (Note 20).

In December 2013 and February 2014, linaclotide was approved in Canada and Mexico, respectively, as a treatment for adult men and women suffering from IBS-C or CIC. Allergan has exclusive rights to commercialize linaclotide in Canada as CONSTELLA and in Mexico as LINZESS. In May 2014, CONSTELLA became commercially available in Canada and in June 2014, LINZESS became commercially available in Mexico. Astellas Pharma Inc. ("Astellas"), the Company's partner in Japan, is developing linaclotide for the treatment of patients with IBS-C and chronic constipation in Japan. In December 2016, Astellas secured approval of linaclotide for the treatment of adults with IBS-C in Japan. In October 2012, the Company entered into a collaboration agreement with AstraZeneca AB (together with its affiliates, "AstraZeneca"), to co-develop and co-commercialize linaclotide in China, Hong Kong and Macau, with AstraZeneca having primary responsibility for the local operational execution. In December 2015, the Company and AstraZeneca filed for approval with the China Food and Drug Administration ("CFDA"), to market linaclotide in China.

The Company and Allergan are also advancing two linaclotide colonic release formulations. Linaclotide colonic release-1 ("CR1"), is a second generation product candidate with the potential to improve abdominal pain relief in adult IBS-C patients. Linaclotide colonic release-2 ("CR2"), is a product candidate with the potential to improve abdominal pain in patients with additional gastrointestinal ("GI"), disorders where lower abdominal pain is a predominant symptom such as non-constipation subtypes of IBS. Further, the Company and Allergan are exploring ways to enhance the clinical profile of LINZESS by studying linaclotide in additional indications and populations to assess its potential to treat various GI conditions. Linaclotide is being developed and commercialized in other parts of the world by certain of the Company's partners.

The Company is also advancing another GI development program, IW-3718, a gastric retentive formulation of a bile acid sequestrant with the potential to provide symptomatic relief in patients with uncontrolled GERD.

In April 2016, the Company discontinued development of IW-9179 for gastroparesis, as top-line data from its exploratory Phase IIa clinical study indicated that IW-9179 did not meaningfully reduce the severity of symptoms in

patients with diabetic gastroparesis. In July 2016, the Company discontinued advancing IW-9179 for the treatment of functional dyspepsia and is no longer advancing the program.

In June 2016, the Company closed a transaction with AstraZeneca (the "Lesinurad Transaction") pursuant to which the Company received an exclusive license to develop, manufacture, and commercialize in the U.S. products containing lesinurad as an active ingredient (the "Lesinurad License"), including ZURAMPIC® and DUZALLO™. Lesinurad 200mg tablets were approved as ZURAMPIC by the U.S. Food and Drug Administration ("FDA") in December 2015 for use in combination with a xanthine oxidase inhibitor ("XOI") for the treatment of hyperuricemia associated with uncontrolled gout. In October 2016, ZURAMPIC became commercially available in the U.S. The Company is developing DUZALLO, a fixed-dose combination product of lesinurad and allopurinol, an XOI, which is included under the Lesinurad License. In January 2017, the FDA accepted for review a new drug application ("NDA"), for DUZALLO for the treatment of hyperuricemia in patients with uncontrolled gout.

The Company periodically enters into co-promotion agreements to maximize salesforce efficiency. The Company and Exact Sciences Corp. ("Exact Sciences") entered into an agreement (the "Cologuard Co-Promotion Agreement") to co-promote Cologuard®, the first and only FDA-approved noninvasive stool DNA screening test for colorectal cancer in March 2015. The parties co-promoted Cologuard through July 2016 and the Cologuard Co-Promotion Agreement was terminated in August 2016. Under the terms of the Cologuard Co-Promotion Agreement, the Company will continue to receive royalty payments through July 2017. In August 2015, the Company and Allergan entered into an agreement for the co-promotion of VIBERZI™ (eluxadoline) in the U.S., Allergan's treatment for adults suffering from IBS with diarrhea ("IBS-D").

In January 2017, the Company and Allergan entered into a commercial agreement under which the adjustments to the Company's or Allergan's share of the net profits under the share adjustment provision of the collaboration agreement for linaclotide in North America are eliminated, in full, in 2018 and all subsequent years (Note 20).

These agreements are more fully described in Note 4, *Business Combinations,* and Note 5, *Collaboration, License, Co-promotion and Other Commercial Agreements,* to these consolidated financial statements.

In June 2015, the Company issued approximately $335.7 million in aggregate principal amount of 2.25% Convertible Senior Notes due 2022 (the "2022 Notes"). The Company received net proceeds of approximately $324.0 million from the sale of the 2022 Notes, after deducting fees and expenses of approximately $11.7 million. In September 2016, the Company closed a direct private placement, pursuant to which the Company subsequently issued $150.0 million in aggregate principal amount of 8.375% notes due 2026 (the "2026 Notes") on January 5, 2017 (the "Funding Date"). The proceeds from the issuance of the 2026 Notes were used to redeem the outstanding principal balance of the 11% PhaRMA Notes due 2024 (the "PhaRMA Notes"), on the Funding Date. These transactions are more fully described in Note 11, *Notes Payable*, to these consolidated financial statements.

The Company was incorporated in Delaware on January 5, 1998 as Microbia, Inc. On April 7, 2008, the Company changed its name to Ironwood Pharmaceuticals, Inc. To date, the Company has dedicated a majority of its activities to the research, development and commercialization of linaclotide, as well as to the research and development of its other product candidates. The Company has incurred significant operating losses since its inception in 1998. As of December 31, 2016, the Company had an accumulated deficit of approximately $1.2 billion.

2. Summary of Significant Accounting Policies

Principles of Consolidation

The accompanying consolidated financial statements include the accounts of Ironwood Pharmaceuticals, Inc. and its wholly owned subsidiaries, Ironwood Pharmaceuticals Securities Corporation and Ironwood Pharmaceuticals GmbH. All intercompany transactions and balances are eliminated in consolidation.

Segment Information

Operating segments are components of an enterprise for which separate financial information is available and is evaluated regularly by the Company's chief operating decision-maker in deciding how to allocate resources and in assessing performance. The Company currently operates in one reportable business segment—human therapeutics.

Use of Estimates

The preparation of consolidated financial statements in accordance with U.S. generally accepted accounting principles requires the Company's management to make estimates and judgments that may affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the consolidated financial statements, and the amounts of revenues and expenses during the reported periods. On an on-going basis, the Company's management evaluates its estimates, judgments and methodologies. Significant estimates and assumptions in the consolidated financial statements include those related to revenue recognition, including returns, rebates, and other pricing adjustments; available-for-sale securities; inventory valuation, and related reserves; impairment of long-lived assets; initial valuation procedures for the issuance of convertible notes; fair value of derivatives; balance sheet classification of notes payable and convertible notes; income taxes, including the valuation allowance for deferred tax assets; research and development expenses; goodwill; contingent consideration; acquired intangible assets; contingencies and share-based compensation. The Company bases its estimates on historical experience and on various other assumptions that are believed to be reasonable, the results of which form the basis for making judgments about the carrying values of assets and liabilities. Actual results may differ materially from these estimates under different assumptions or conditions. Changes in estimates are reflected in reported results in the period in which they become known.

Cash and Cash Equivalents

The Company considers all highly liquid investment instruments with a remaining maturity when purchased of three months or less to be cash equivalents. Investments qualifying as cash equivalents primarily consist of money market funds and U.S. government-sponsored securities. The carrying amount of cash equivalents approximates fair value. The amount of cash equivalents included in cash and cash equivalents was approximately $32.5 million and approximately $258.2 million at December 31, 2016 and 2015, respectively.

Restricted Cash

The Company is contingently liable under unused letters of credit with a bank, related to the Company's facility lease and automobile lease agreements, in the amount of approximately $8.2 million and approximately $8.7 million as of December 31, 2016 and 2015, respectively. As a result, the Company has restricted cash of approximately $8.2 million and approximately $8.7 million as of December 31, 2016 and 2015, respectively, securing these letters of credit. The cash will be restricted until the termination or modification of the lease arrangements.

Available-for-Sale Securities

The Company classifies all short-term investments with a remaining maturity when purchased of greater than three months as available-for-sale. Available-for-sale securities are recorded at fair value, with the unrealized gains and losses reported in other comprehensive income (loss). The amortized cost of debt securities in this category is adjusted for the amortization of premiums and accretion of discounts to maturity. Such amortization is included in interest and investment income. Realized gains and losses, interest, dividends, and declines in value judged to be other than temporary on available-for-sale securities are included in interest and investment income.

The cost of securities sold is based on the specific identification method for purposes of recording realized gains and losses. To determine whether an other-than-temporary impairment exists, the Company considers whether it has the ability and intent to hold the investment until a market price recovery, and whether evidence indicating the recoverability of the cost of the investment outweighs evidence to the contrary. There were no other-than-temporary impairments for the years ended December 31, 2016, 2015 or 2014.

Inventory

Inventory is stated at the lower of cost or net realizable value with cost determined under the first-in, first-out basis in accordance with Accounting Standards Update ("ASU") No. 2015-11, *Inventory (Topic 330): Simplifying the Measurement of Inventory* ("ASU 2015-11").

The Company evaluates inventory levels quarterly and any inventory that has a cost basis in excess of its expected net realizable value, inventory that becomes obsolete, inventory in excess of expected sales requirements,

inventory that fails to meet commercial sale specifications or is otherwise impaired is written down with a corresponding charge to the statement of operations in the period that the impairment is first identified. The Company also assesses, on a quarterly basis, whether it has any excess non-cancelable purchase commitments resulting from its minimum supply agreements with its suppliers. The Company relies on data from several sources to estimate the net realizable value of inventory and non-cancelable purchase commitments, including partner forecasts of projected inventory purchases that are received quarterly, the Company's internal forecasts and related process, historical sales by geographic region, and the status of and progress toward commercialization of linaclotide in partnered territories.

The Company capitalizes inventories manufactured in preparation for initiating sales of a product candidate when the related product candidate is considered to have a high likelihood of regulatory approval and the related costs are expected to be recoverable through sales of the inventories. In determining whether or not to capitalize such inventories, the Company evaluates, among other factors, information regarding the product candidate's safety and efficacy, the status of regulatory submissions and communications with regulatory authorities and the outlook for commercial sales, including the existence of current or anticipated competitive drugs and the availability of reimbursement. In addition, the Company evaluates risks associated with manufacturing the product candidate, including the ability of the Company's third-party suppliers to complete the validation batches, and the remaining shelf life of the inventories.

Costs associated with developmental products prior to satisfying the inventory capitalization criteria are charged to research and development expense as incurred.

Concentrations of Suppliers

The Company relies on third-party manufacturers and its collaboration partners to manufacture the linaclotide active pharmaceutical ingredient ("API"), linaclotide drug product and lesinurad drug product.

Currently, there are two third-party manufacturers approved for the production of the linaclotide API in three facilities. Each of Allergan and Astellas is responsible for drug product manufacturing of linaclotide into finished product for its respective territory. Under the Company's linaclotide collaboration with AstraZeneca, the Company is responsible for drug product and finished goods manufacturing for China, Hong Kong and Macau. The Company also has an agreement with another independent third party to serve as a second source of API manufacturing of linaclotide for its partnered territories.

In connection with the Lesinurad License with AstraZeneca, the Company and AstraZeneca entered into a commercial supply agreement (the "Lesinurad CSA"), pursuant to which the Company relies exclusively on AstraZeneca for the commercial manufacture and supply of ZURAMPIC and, if approved, DUZALLO.

If any of the Company's suppliers were to limit or terminate production or otherwise fail to meet the quality or delivery requirements needed to satisfy the supply commitments, the process of locating and qualifying alternate sources could require up to several months, during which time the Company's production could be delayed. Such delays could have a material adverse effect on the Company's business, financial position and results of operations.

Accounts Receivable and Related Valuation Account

The Company makes judgments as to its ability to collect outstanding receivables and provides an allowance for receivables when collection becomes doubtful. Provisions are made based upon a specific review of all significant outstanding invoices and the overall quality and age of those invoices not specifically reviewed. The Company's receivables primarily relate to amounts reimbursed under its collaboration, license and co-promotion agreements. The Company believes that credit risks associated with these partners are not significant. To date, the Company has not had any write-offs of bad debt, and the Company did not have an allowance for doubtful accounts as of December 31, 2016 and 2015.

In connection with the Lesinurad License, the Company and AstraZeneca entered into a transitional service agreement, ("the Lesinurad TSA"), pursuant to which AstraZeneca is providing certain support services, including development, regulatory and commercial services, to the Company for ZURAMPIC until such activities under the Lesinurad TSA are transferred to the Company. Under the Lesinurad TSA, AstraZeneca is facilitating the collections of sales of ZURAMPIC in the U.S. While under the Lesinurad TSA, the receivables due from AstraZeneca for sales of

ZURAMPIC in the U.S. are net against payables due to AstraZeneca for costs incurred in connection with the lesinurad activities, resulting in a net payable at December 31, 2016.

Concentrations of Credit Risk

Financial instruments that subject the Company to credit risk primarily consist of cash and cash equivalents, restricted cash, available-for-sale securities, and accounts receivable. The Company maintains its cash and cash equivalent balances with high-quality financial institutions and, consequently, the Company believes that such funds are subject to minimal credit risk. The Company's available-for-sale investments primarily consist of U.S. Treasury securities and certain U.S. government-sponsored securities and potentially subject the Company to concentrations of credit risk. The Company has adopted an investment policy which limits the amounts the Company may invest in any one type of investment, and requires all investments held by the Company to be at least A+ rated, thereby reducing credit risk exposure.

Accounts receivable, including related party accounts receivable, primarily consist of amounts due under the linaclotide collaboration agreement with Allergan for North America and the linaclotide license agreement with Astellas for Japan (Note 5) for which the Company does not obtain collateral. Accounts receivable or payable to or from Allergan are presented as related party transactions on the consolidated balance sheets as Allergan owns common stock of the Company.

The percentages of revenue recognized from significant customers of the Company in the years ended December 31, 2016, 2015 and 2014 as well as the account receivable balances, net of any payables due, at December 31, 2016 and 2015 are included in the following table:

	Accounts Receivable December 31,		Revenue Year Ended December 31,		
	2016	2015	2016	2015	2014
Collaborative Partner:					
Linaclotide Agreements:					
Allergan (North America and Europe)[1]	99 %	95 %	82 %	90 %	62 %
Almirall (Europe) [1]	— %	— %	— %	— %	10 %
Astellas (Japan)	— %	2 %	16 %	5 %	23 %

(1) In October 2015, Almirall transferred its exclusive license to develop and commercialize linaclotide in Europe to Allergan.

For the years ended December 31, 2016, 2015 and 2014, no additional customers accounted for more than 10% of the Company's revenue.

Property and Equipment

Property and equipment, including leasehold improvements, are recorded at cost, and are depreciated when placed into service using the straight-line method based on their estimated useful lives as follows:

Asset Description	Estimated Useful Life (In Years)
Manufacturing equipment	10
Laboratory equipment	5
Computer and office equipment	3
Furniture and fixtures	7
Software	3

Included in property and equipment are certain costs of software obtained for internal use. Costs incurred during the preliminary project stage are expensed as incurred, while costs incurred during the application development stage are capitalized and amortized over the estimated useful life of the software. The Company also capitalizes costs related to specific upgrades and enhancements when it is probable the expenditures will result in additional functionality. Maintenance and training costs related to software obtained for internal use are expensed as incurred.

Leasehold improvements are amortized over the shorter of the estimated useful life of the asset or the lease term. Capital lease assets are amortized over the lease term. However, if ownership was transferred by the end of the capital lease, or there was a bargain purchase option, such capital lease assets would be amortized over the useful life that would be assigned if such assets were owned.

Costs for capital assets not yet placed into service have been capitalized as construction in progress, and will be depreciated in accordance with the above guidelines once placed into service. Maintenance and repair costs are expensed as incurred.

Finite and Indefinite-Lived Intangible Assets

The Company records the fair value of purchased intangible assets with finite useful lives as of the transaction date of a business combination. Purchased intangible assets with finite useful lives are amortized to their estimated residual values over their estimated useful lives. The Company evaluates the finite-lived intangible assets for impairment whenever events or changes in circumstances indicate the reduction in the fair value below their respective carrying amounts. If the Company determines that an impairment has occurred, a write-down of the carrying value and an impairment charge to operating expenses in the period the determination is made is recorded. In addition, the remaining estimated useful life of the finite-lived intangible asset would be reassessed.

In accordance with Accounting Standards Codification ("ASC") Topic 350, *Intangibles – Goodwill and Other* ("ASC 350"), during the period that an asset is considered indefinite-lived, such as in-process research and development ("IPR&D"), it will not be amortized. Acquired IPR&D represents the fair value assigned to research and development assets that have not reached technological feasibility. The value assigned to acquired IPR&D is determined by estimating the costs to develop the acquired technology into commercially viable products, estimating the resulting revenue from the projects, and discounting the net cash flows to present value. The revenue and costs projections used to value acquired IPR&D are, as applicable, reduced based on the probability of success of developing a new drug. Additionally, the projections consider the relevant market sizes and growth factors, expected trends in technology, and the nature and expected timing of new product introductions by the Company and its competitors. The rates utilized to discount the net cash flows to their present value are commensurate with the stage of development of the projects and uncertainties in the economic estimates used in the projections. Upon the acquisition of IPR&D, the Company completes an assessment of whether its acquisition constitutes the purchase of a single asset or a group of assets. Multiple factors are considered in this assessment, including the nature of the technology acquired, the presence or absence of separate cash flows, the development process and stage of completion, quantitative significance and the rationale for entering into the transaction. Indefinite-lived assets are maintained on the Company's consolidated balance sheet until either the project underlying it is completed or the asset becomes impaired. Indefinite-lived assets are tested for impairment on an annual basis, or whenever events or changes in circumstances indicate the reduction in the fair value of the IPR&D asset below its respective carrying amount. If the Company determines that an impairment has occurred, a write-down of the carrying value and an impairment charge to operating expenses in the period the determination is made is recorded. When development of an IPR&D asset is complete the associated asset is deemed finite-lived and is then amortized based on its respective estimated useful life at that point.

Goodwill

Goodwill represents the difference between the purchase price and the fair value of the identifiable tangible and intangible net assets when accounted for using the purchase method of accounting. Goodwill is not amortized, but is reviewed for impairment. The Company tests its goodwill for impairment annually, or whenever events or changes in circumstances indicate an impairment may have occurred, by comparing its carrying value to its implied fair value in accordance with ASC 350. Impairment may result from, among other things, deterioration in the performance of the acquired asset, adverse market conditions, adverse changes in applicable laws or regulations and a variety of other circumstances. If the Company determines that an impairment has occurred, a write-down of the carrying value and an impairment charge to operating expenses in the period the determination is made is recorded. In evaluating the carrying value of goodwill, the Company must make assumptions regarding estimated future cash flows and other factors. Changes in strategy or market conditions could significantly impact those judgments in the future and require an adjustment to the recorded balances.

Impairment of Long-Lived Assets

The Company regularly reviews the carrying amount of its long-lived assets to determine whether indicators of impairment may exist, which warrant adjustments to carrying values or estimated useful lives. If indications of impairment exist, projected future undiscounted cash flows associated with the asset are compared to the carrying amount to determine whether the asset's value is recoverable. If the carrying value of the asset exceeds such projected undiscounted cash flows, the asset will be written down to its estimated fair value. There were no significant impairments of long-lived assets for the years ended December 31, 2016, 2015, or 2014.

Income Taxes

The Company provides for income taxes under the liability method. Deferred tax assets and liabilities are determined based on differences between financial reporting and tax bases of assets and liabilities and are measured using the enacted tax rates in effect when the differences are expected to reverse. Deferred tax assets are reduced by a valuation allowance to reflect the uncertainty associated with their ultimate realization.

The Company accounts for uncertain tax positions recognized in the consolidated financial statements in accordance with the provisions of ASC Topic 740, *Income Taxes*, by prescribing a more-likely-than-not threshold for financial statement recognition and measurement of a tax position taken or expected to be taken in a tax return. When uncertain tax positions exist, the Company recognizes the tax benefit of tax positions to the extent that the benefit will more likely than not be realized. The determination as to whether the tax benefit will more likely than not be realized is based upon the technical merits of the tax position as well as consideration of the available facts and circumstances. The Company evaluates uncertain tax positions on a quarterly basis and adjusts the level of the liability to reflect any subsequent changes in the relevant facts surrounding the uncertain positions. Any changes to these estimates, based on the actual results obtained and/or a change in assumptions, could impact the Company's income tax provision in future periods. Interest and penalty charges, if any, related to unrecognized tax benefits would be classified as a provision for income tax in the Company's consolidated statement of operations.

Deferred Financing Costs

Deferred financing costs include costs directly attributable to the Company's offerings of its equity securities and its debt financings. Costs attributable to equity offerings are charged against the proceeds of the offering once the offering is completed. Costs attributable to debt financings are deferred and amortized over the term of the debt using the effective interest rate method. A portion of the deferred financing cost incurred in connection with the 2022 Notes was deemed to relate to the equity component and was allocated to additional paid in capital. In accordance with ASU No. 2015-03, *Simplifying the Presentation of Debt Issuance Costs* ("ASU 2015-03"), the Company presents debt issuance costs on the balance sheet as a direct deduction from the associated debt liability. The 2026 Notes, 2022 Notes and PhaRMA Notes are more fully described in Note 11, *Notes Payable*, to these consolidated financial statements.

Derivative Assets and Liabilities

In June 2015, in connection with the issuance of the 2022 Notes, the Company entered into convertible note hedge transactions (the "Convertible Note Hedges"). Concurrently with entering into the Convertible Note Hedges, the Company also entered into certain warrant transactions in which it sold note hedge warrants (the "Note Hedge Warrants") to the Convertible Note Hedge counterparties to acquire 20,249,665 shares of the Company's Class A common stock, subject to customary anti-dilution adjustments (Note 11). These instruments are derivative financial instruments under ASC Topic 815, *Derivatives and Hedging* ("ASC 815").

These derivatives are recorded as assets or liabilities at fair value each reporting period and the fair value is determined using the Black-Scholes option-pricing model. The changes in fair value are recorded as a component of other (expense) income in the consolidated statements of operations. Significant inputs used to determine the fair value include the price per share of the Company's Class A common stock on the date of valuation, time to maturity of the derivative instruments, the strike prices of the derivative instruments, the risk free interest rate, and the volatility of the Company's Class A common stock. Changes to these inputs could materially affect the valuation of the Convertible Note Hedges and Note Hedge Warrants in future periods.

Revenue Recognition

The Company's revenues are generated primarily through collaborative arrangements and licensing related to the research and development and commercialization of linaclotide, as well as co-promotion arrangements in the U.S. and product revenue related to the commercial sale of ZURAMPIC in the U.S. The terms of the collaborative research and development, licensing, and co-promotion agreements contain multiple deliverables which may include (i) licenses, (ii) research and development activities, including participation on joint steering committees, (iii) the manufacture of finished drug product, API, or development materials for a partner which are reimbursed at a contractually determined rate, and (iv) co-promotion activities by the Company's clinical sales specialists. Non-refundable payments to the Company under these agreements may include (i) up-front license fees, (ii) payments for research and development activities, (iii) payments for the manufacture of finished drug product, API, or development materials, (iv) payments based upon the achievement of certain milestones, (v) payments for sales detailing, promotional support services and medical education initiatives, and (vi) royalties on product sales. Additionally, the Company may receive its share of the net profits or bear its share of the net losses from the sale of linaclotide in the U.S. and for China, Hong Kong and Macau through its collaborations with Allergan and AstraZeneca, respectively.

At December 31, 2016, the Company had collaboration agreements with Allergan (North America) and AstraZeneca (China, Hong Kong and Macau), as well as license agreements with Allergan (Europe) and Astellas (Japan) to develop and commercialize linaclotide. The Company also had an exclusive license agreement with AstraZeneca to develop, manufacture, and commercialize products containing lesinurad as an active agreement in the U.S. Additionally, the Company had a co-promotion agreement with Allergan for VIBERZI. Under the terms of the Company's co-promotion agreement with Exact Sciences, which was terminated in August 2016, the Company will continue to receive royalty payments through July 2017.

The Company recognizes revenue when there is persuasive evidence that an arrangement exists, services have been rendered or delivery has occurred, the price is fixed or determinable, and collection is reasonably assured.

For certain of the Company's arrangements, particularly the linaclotide license agreement with Allergan for all countries worldwide other than China, Hong Kong, Macau, Japan, and the countries and territories of North America, it is required that taxes be withheld on payments to the Company. The Company has adopted a policy to recognize revenue net of these tax withholdings.

Agreements Entered into Prior to January 1, 2011

For arrangements that include multiple deliverables and were entered into prior to January 1, 2011, the Company follows the provisions of ASC Topic 605-25, *Revenue Recognition—Multiple-Element Arrangements* (''ASC 605-25''), in accounting for these agreements. Under ASC 605-25, the Company was required to identify the deliverables included within the agreement and evaluate which deliverables represent separate units of accounting. Collaborative research and development and licensing agreements that contained multiple deliverables were divided into separate units of accounting when the following criteria were met:

- Delivered element(s) had value to the collaborator on a standalone basis,
- There was objective and reliable evidence of the fair value of the undelivered obligation(s), and
- If the arrangement included a general right of return relative to the delivered item(s), delivery or performance of the undelivered item(s) was considered probable and substantially within the Company's control.

The Company allocated arrangement consideration among the separate units of accounting either on the basis of each unit's respective fair value or using the residual method, and applied the applicable revenue recognition criteria to each of the separate units. If the separation criteria were not met, revenue of the combined unit of accounting was recorded based on the method appropriate for the last delivered item.

Up-Front License Fees

Prior to the adoption of ASU 2009-13, the Company recognized revenue from nonrefundable, up-front license fees on a straight-line basis over the contracted or estimated period of performance, which is typically the period over which the research and development is expected to occur or manufacturing services are expected to be provided. Accordingly, the Company was required to make estimates regarding the drug development and commercialization timelines for drugs and drug candidates being developed pursuant to any applicable agreement. The determination of the length of the period over which to recognize the revenue is subject to judgment and estimation and impacted the amount of revenue recognized in each period. Quarterly, the Company reassessed its period of substantial involvement over which the Company amortized its up-front license fees and made adjustments as appropriate. At December 31, 2016, the up-front fees associated with the Company's license agreement with Astellas were fully amortized as the period of performance had ended. The up-front license fees under the Allergan collaboration for North America and the Allergan collaboration for Europe (previously with Almirall) were fully amortized at December 31, 2015, as the period of performance under those arrangements ended in the three months ended September 30, 2012.

Agreements Entered into or Materially Modified on or after January 1, 2011

The Company evaluates revenue from new multiple element agreements entered into on or after January 1, 2011 under ASU No. 2009-13, *Multiple-Deliverable Revenue Arrangements* ("ASU 2009-13"). The Company also evaluates whether amendments to its multiple element arrangements are considered material modifications that are subject to the application of ASU 2009-13. This evaluation requires management to assess all relevant facts and circumstances and to make subjective determinations and judgments. As part of this assessment, the Company considers whether the modification results in a material change to the arrangement, including whether there is a change in total arrangement consideration that is more than insignificant, whether there are changes in the deliverables included in the arrangement, whether there is a change in the term of the arrangement and whether there is a significant modification to the delivery schedule for contracted deliverables.

When evaluating multiple element arrangements under ASU 2009-13, the Company considers whether the deliverables under the arrangement represent separate units of accounting. This evaluation requires subjective determinations and requires management to make judgments about the individual deliverables and whether such deliverables are separable from the other aspects of the contractual relationship. In determining the units of accounting, management evaluates certain criteria, including whether the deliverables have standalone value, based on the consideration of the relevant facts and circumstances for each arrangement. Factors considered in this determination include the research, manufacturing and commercialization capabilities of the partner and the availability of relevant research and manufacturing expertise in the general marketplace. In addition, the Company considers whether the collaborator can use the license or other deliverables for their intended purpose without the receipt of the remaining elements, and whether the value of the deliverable is dependent on the undelivered items and whether there are other vendors that can provide the undelivered items.

The consideration received is allocated among the separate units of accounting using the relative selling price method, and the applicable revenue recognition criteria are applied to each of the separate units.

The Company determines the estimated selling price for deliverables using vendor-specific objective evidence ("VSOE") of selling price, if available, third-party evidence ("TPE") of selling price if VSOE is not available, or best estimate of selling price ("BESP") if neither VSOE nor TPE is available. Determining the BESP for a deliverable requires significant judgment. The Company uses BESP to estimate the selling price for licenses to the Company's proprietary technology, since the Company often does not have VSOE or TPE of selling price for these deliverables. In those circumstances where the Company utilizes BESP to determine the estimated selling price of a license to the Company's proprietary technology, the Company considers market conditions as well as entity-specific factors, including those factors contemplated in negotiating the agreements as well as internally developed models that include assumptions related to the market opportunity, estimated development costs, probability of success and the time needed to commercialize a product candidate pursuant to the license. In validating the Company's BESP, the Company evaluates whether changes in the key assumptions used to determine the BESP will have a significant effect on the allocation of arrangement consideration between multiple deliverables.

At December 31, 2016, the Company's collaboration agreement with AstraZeneca for linaclotide and co-promotion agreements with Allergan for VIBERZI and Exact Sciences for Cologuard in the U.S. are each being accounted for under ASU 2009-13.

Up-Front License Fees

When management believes the license to its intellectual property has stand-alone value, the Company generally recognizes revenue attributed to the license upon delivery. When management believes the license to its intellectual property does not have stand-alone value from the other deliverables to be provided in the arrangement, it is combined with other deliverables and the revenue of the combined unit of accounting is recorded based on the method appropriate for the last delivered item.

Milestones

At the inception of each arrangement that includes pre-commercial milestone payments, the Company evaluates whether each pre-commercial milestone is substantive, in accordance with ASU No. 2010-17, *Revenue Recognition—Milestone Method* ("ASU 2010-17"), adopted on January 1, 2011. This evaluation includes an assessment of whether (a) the consideration is commensurate with either (1) the entity's performance to achieve the milestone, or (2) the enhancement of the value of the delivered item(s) as a result of a specific outcome resulting from the entity's performance to achieve the milestone, (b) the consideration relates solely to past performance and (c) the consideration is reasonable relative to all of the deliverables and payment terms within the arrangement. The Company evaluates factors such as the scientific, clinical, regulatory, commercial and other risks that must be overcome to achieve the respective milestone, the level of effort and investment required and whether the milestone consideration is reasonable relative to all deliverables and payment terms in the arrangement in making this assessment. At December 31, 2016, the Company had no pre-commercial milestones that were deemed substantive. If a substantive pre-commercial milestone were achieved and collection of the related receivable was reasonably assured, the Company would recognize revenue related to the milestone in its entirety in the period in which the milestone was achieved. If the Company were to achieve milestones that are considered substantive under any of the Company's collaborations, the Company may experience significant fluctuations in collaborative arrangements revenue from quarter to quarter and year to year depending on the timing of achieving such substantive milestones. In those circumstances where a pre-commercial milestone is not substantive, the Company recognizes as revenue on the date the milestone is achieved an amount equal to the applicable percentage of the performance period that had elapsed as of the date the milestone was achieved, with the balance being deferred and recognized over the remaining period of performance.

Commercial milestones are accounted for as royalties and are recorded as revenue upon achievement of the milestone, assuming all other revenue recognition criteria are met.

Net Profit or Net Loss Sharing

In accordance with ASC 808 Topic, *Collaborative Arrangements*, and ASC 605-45, *Principal Agent Considerations*, the Company considers the nature and contractual terms of the arrangement and the nature of the Company's business operations to determine the classification of the transactions under the Company's collaboration agreements. The Company records revenue transactions gross in the consolidated statements of operations if it is deemed the principal in the transaction, which includes being the primary obligor and having the risks and rewards of ownership.

The Company recognizes its share of the pre-tax commercial net profit or net loss generated from the sales of LINZESS in the U.S. in the period the product sales are reported by Allergan and related cost of goods sold and selling, general and administrative expenses are incurred by the Company and its collaboration partner. These amounts are partially determined based on amounts provided by Allergan and involve the use of estimates and judgments, such as product sales allowances and accruals related to prompt payment discounts, chargebacks, governmental and contractual rebates, wholesaler fees, product returns, and co-payment assistance costs, which could be adjusted based on actual results in the future. The Company is highly dependent on Allergan for timely and accurate information regarding any net revenues realized from sales of LINZESS in the U.S. and the costs incurred in selling it, in order to accurately report its results of operations. For the periods covered in the consolidated financial statements presented, there have been no material changes to prior period estimates of revenues, cost of goods sold or selling, general and administrative expenses associated with the sales of LINZESS in the U.S. However, if the Company does not receive timely and accurate

information or incorrectly estimates activity levels associated with the collaboration at a given point in time, the Company could be required to record adjustments in future periods.

The Company records its share of the net profits or net losses from the sales of LINZESS in the U.S. on a net basis and presents the settlement payments to and from Allergan as collaboration expense or collaborative arrangements revenue, as applicable, as the Company is not the primary obligor and does not have the risks and rewards of ownership in the collaboration agreement with Allergan for North America. The Company and Allergan settle the cost sharing quarterly, such that the Company's statement of operations reflects 50% of the pre-tax net profit or loss generated from sales of LINZESS in the U.S.

Royalties on Product Sales

The Company receives or expects to receive in the future royalty revenues under certain of the Company's license or collaboration agreements. If the Company does not have any future performance obligations under these license or collaborations agreements, the Company records these revenues as earned. To the extent the Company does not have access to the royalty reports from the Company's partners or the ability to accurately estimate the royalty revenue in the period earned, the Company records such royalty revenues one quarter in arrears.

Product Revenue, Net

Net product revenue is derived from sales of ZURAMPIC in the U.S. Pursuant to the terms and conditions of the Lesinurad TSA, the Company sells ZURAMPIC principally to a limited number of major wholesalers and selected regional wholesalers through certain of AstraZeneca's existing arrangements (the "Distributors"). The Distributors subsequently resell ZURAMPIC to patients and healthcare providers.

The Company recognizes net product revenue from sales of ZURAMPIC in accordance with ASC 605, *Revenue Recognition* ("ASC 605"), when persuasive evidence of an arrangement exists, delivery has occurred and title of the product and associated risk of loss has passed to the customer, the price is fixed or determinable, and collection from the customer has been reasonably assured. ASC 605 requires, among other criteria, that future returns can be reasonably estimated in order to recognize revenue. The Company recognizes revenue on a gross basis as it has concluded that it is the principal in the product revenue transactions for ZURAMPIC, as it holds the general inventory risk, latitude in establishing price, physical loss inventory risk and credit risk.

The first units of ZURAMPIC were shipped to Distributors in September 2016 under the Lesinurad TSA. Due to the early stage of the product launch, the Company determined that it was not able to reliably make certain estimates, including returns, necessary to recognize product revenue upon shipment to Distributors. As a result, the Company records net product revenue for ZURAMPIC using a deferred revenue recognition model (sell-through). Under the deferred revenue model, the Company does not recognize revenue until ZURAMPIC is prescribed to an end-user. During the transition services period, pursuant to the Lesinurad TSA, AstraZeneca invoices Distributors upon shipment of ZURAMPIC on behalf of the Company. The Company records deferred revenue upon receipt of the quarterly cash payment from AstraZeneca for shipments of ZURAMPIC to Distributors. No such payments had been received by the Company as of December 31, 2016. The Company recognizes net product revenue when ZURAMPIC is prescribed to the end-user, on a first-in, first-out basis using estimated prescription demand and pharmacy demand from third party sources and the Company's analysis of third party market research data, as well as other third party information. The Company's estimates are subject to the inherent limitations of estimates that rely on third party data, as certain third party information is itself in the form of estimates. The Company will continue to evaluate when, if ever, it has sufficient volume of historical activity and visibility into the distribution channel, in order to reasonably make all estimates required under ASC 605 to recognize revenue upon shipment to the Distributor (Note 5).

The Company's net product revenues for ZURAMPIC represent total revenues less customer credits, including actual returns, rebates, and other discounts. These allowances are recorded for cash consideration given by a vendor to a customer that is presumed to be a reduction of the selling prices of the Company's products or services and, therefore, characterized as a reduction of revenue.

The cost basis of the product purchased by the Company pursuant to the Lesinurad TSA is included as a component of other current assets. Upon recognition of product revenue, the corresponding product cost is recorded as cost of revenues on the Company's consolidated statements of operations.

Other

The Company produces linaclotide finished drug product, API and development materials for certain of its partners.

The Company recognizes revenue on linaclotide finished drug product, API and development materials when the material has passed all quality testing required for collaborator acceptance, delivery has occurred, title and risk of loss have transferred to the partner, the price is fixed or determinable, and collection is reasonably assured. As it relates to development materials and API produced for Astellas, the Company is reimbursed at a contracted rate. Such reimbursements are considered as part of revenue generated pursuant to the Astellas license agreement and are presented as collaborative arrangements revenue. Any linaclotide finished drug product, API and development materials currently produced for Allergan for the U.S. or AstraZeneca for China, Hong Kong and Macau are recognized in accordance with the cost-sharing provisions of the Allergan and AstraZeneca collaboration agreements, respectively. In October 2015, Almirall transferred its exclusive license to develop and commercialize linaclotide in Europe to Allergan, and the Company separately entered into an amendment to the license agreement with Allergan relating to the development and commercialization of linaclotide in Europe. Pursuant to the terms of the amendment, Allergan assumed responsibility for the manufacturing of linaclotide API for Europe from the Company, as well as the associated costs (Note 5).

Cost of Revenues

Cost of collaborative arrangements revenue related to linaclotide collaboration and license agreements is recognized upon shipment of linaclotide API to certain of the Company's licensing partners outside of the U.S. and consists of the internal and external costs of producing such API. In addition to the cost of collaborative arrangement revenue related to linaclotide API, the Company records cost of product revenue for sales of ZURAMPIC in the U.S. Cost of product revenue related to the sales of ZURAMPIC includes the cost of producing finished goods that correspond with product revenue for the reporting period, as well as certain period costs related to freight, packaging, stability and quality testing, and customer acquisition.

During the year ended December 31, 2015, the Company recorded expenses of approximately $17.6 million for the write-down of inventory and an accrual for excess non-cancelable inventory purchase commitments related to linaclotide API. During the year ended December 31, 2014, the Company wrote-down approximately $20.3 million in inventory to an estimated net realizable value of approximately $5.0 million. The write-down of inventory to net realizable value and the loss on non-cancelable inventory purchase commitments for the years ended December 31, 2015 and December 31, 2014 were recorded as a separate line item in the Company's consolidated statement of operations. These charges are more fully described in Note 8, *Inventory*, to these consolidated financial statements.

Research and Development Costs

The Company expenses research and development costs to operations as incurred. The Company defers and capitalizes nonrefundable advance payments made by the Company for research and development activities until the related goods are received or the related services are performed.

Research and development expenses are comprised of costs incurred in performing research and development activities, including salary, benefits and other employee-related expenses; share-based compensation expense; laboratory supplies and other direct expenses; facilities expenses; overhead expenses; third-party contractual costs relating to nonclinical studies and clinical trial activities and related contract manufacturing expenses, development of manufacturing processes and regulatory registration of third-party manufacturing facilities; licensing fees for the Company's product candidates; and other outside expenses.

The Company has collaboration agreements with Allergan for the U.S. and AstraZeneca for China, Hong Kong and Macau pursuant to which it shares research and development expenses related to linaclotide. The Company records expenses incurred under the linaclotide collaboration arrangements for such work as research and development expense. Because the collaboration arrangements are cost sharing arrangements, the Company concluded that when there is a period during the collaboration arrangements during which the Company is owed payment from Allergan or AstraZeneca for such territories, the Company records the reimbursement by Allergan or AstraZeneca for their share of the development effort as a reduction of research and development expense. Amounts owed to Allergan or AstraZeneca for such territories are recorded as incremental research and development expense.

Selling, General and Administrative Expenses

The Company expenses selling, general and administrative costs to operations as incurred. Selling, general and administrative expense consists primarily of compensation, benefits and other employee-related expenses for personnel in the Company's administrative, finance, legal, information technology, business development, commercial, sales, marketing, communications and human resource functions. Other costs include the legal costs of pursuing patent protection of the Company's intellectual property, general and administrative related facility costs, insurance costs and professional fees for accounting and legal services.

Under the linaclotide collaboration agreements with Allergan for the U.S. and AstraZeneca for China, Hong Kong and Macau, the Company is reimbursed for certain selling, general and administrative expenses and it nets these reimbursements against selling, general and administrative expenses as incurred. Payments to Allergan or AstraZeneca for such territories are recorded as incremental selling, general and administrative expense.

Share-Based Compensation

The Company's share-based compensation programs grant awards which have included stock awards, restricted stock awards ("RSAs"), restricted stock units ("RSUs"), and stock options. Share-based compensation is recognized as an expense in the financial statements based on the grant date fair value over the requisite service period. For awards that vest based on service conditions, the Company uses the straight-line method to allocate compensation expense to reporting periods. The grant date fair value of options granted is calculated using the Black-Scholes option-pricing model, which requires the use of subjective assumptions including volatility, expected term, and expected forfeitures, among others. The fair value of the Company's RSUs is based on the market value of the Company's Class A common stock on the date of grant. Compensation expense for RSUs is recognized on a straight-line basis over the applicable service period.

The Company records the expense for stock option grants subject to performance-based milestone vesting using the accelerated attribution method over the remaining service period when management determines that achievement of the milestone is probable. Management evaluates when the achievement of a performance-based milestone is probable based on the relative satisfaction of the performance conditions as of the reporting date.

The Company records the expense of stock options granted for services rendered by non-employees based on the estimated fair value of the stock option using the Black-Scholes option-pricing model. The fair value of unvested non-employee stock option awards is remeasured at each reporting period and expensed over the vesting term of the underlying stock options.

While the assumptions used to calculate and account for share-based compensation awards represent management's best estimates, these estimates involve inherent uncertainties and the application of management's judgment. As a result, if revisions are made to our underlying assumptions and estimates, the Company's share-based compensation expense could vary significantly from period to period.

Patent Costs

The Company incurred and recorded as operating expense legal and other fees related to patents of approximately $2.3 million, approximately $2.2 million, and approximately $1.3 million for the years ended December 31, 2016, 2015 and 2014, respectively. These costs were charged to selling, general and administrative expenses as incurred.

Business Combinations

The Company evaluates acquisitions of assets and other similar transactions to assess whether or not the transaction should be accounted for as a business combination by assessing whether or not the Company has acquired inputs and processes that have the ability to create outputs. If determined to be a business combination, the Company accounts for business acquisitions under the acquisition method of accounting as indicated in the Financial Accounting Standards Board ("FASB") issued ASC Topic 805, *Business Combinations*, ("ASC 805") which requires the acquiring entity in a business combination to recognize the fair value of all assets acquired, liabilities assumed, and any non-controlling interest in the acquiree and establishes the acquisition date as the fair value measurement point. Accordingly, the Company recognizes assets acquired and liabilities assumed in business combinations, including contingent liabilities and non-controlling interest in the acquiree based on the fair value estimates as of the date of acquisition. In accordance with ASC 805, the Company recognizes and measures goodwill as of the acquisition date, as the excess of the fair value of the consideration paid over the fair value of the identified net assets acquired.

The consideration for the Company's business acquisitions includes future payments that are contingent upon the occurrence of a particular event or events. The obligations for such contingent consideration payments are recorded at fair value on the acquisition date. The contingent consideration obligations are then evaluated each reporting period. Changes in the fair value of contingent consideration obligations, other than changes due to payments, are recognized as a (gain) loss on fair value remeasurement of contingent consideration in the consolidated statements of operations.

Net Income (Loss) Per Share

The Company calculates basic net income (loss) per common share and diluted net income (loss) per common share by dividing the net income (loss) by the weighted average number of common shares outstanding during the period. Diluted net income (loss) per common share is computed by dividing net income (loss) by the diluted number of shares outstanding during the period. Except where the result would be antidilutive to net income (loss), diluted net income (loss) per common share is computed assuming the conversion of the 2022 Notes, the exercise of outstanding common stock options and the vesting of RSUs and restricted stock (using the treasury stock method), as well as their related income tax effects. The Company allocates undistributed earnings between the classes of common stock on a one-to-one basis when computing net income (loss) per share. As a result, basic and diluted net income (loss) per Class A and Class B shares are equivalent.

Comprehensive Income (Loss)

Comprehensive income (loss) is defined as the change in equity of a business enterprise during a period from transactions, and other events and circumstances from non-owner sources and currently consists of net loss and changes in unrealized gains and losses on available-for-sale securities.

Subsequent Events

The Company considers events or transactions that have occurred after the balance sheet date of December 31, 2016, but prior to the filing of the financial statements with the Securities and Exchange Commission to provide additional evidence relative to certain estimates or to identify matters that require additional recognition or disclosure. Subsequent events have been evaluated through the filing of the financial statements accompanying this Annual Report on Form 10-K.

New Accounting Pronouncements

From time to time, new accounting pronouncements are issued by the FASB or other standard setting bodies that are adopted by the Company as of the specified effective date. Except as set forth below, the Company did not adopt any new accounting pronouncements during the year ended December 31, 2016 that had a material effect on its consolidated financial statements.

In May 2014, the FASB issued ASU No. 2014-09, *Revenue from Contracts with Customers* ("ASU 2014-09"), which supersedes the revenue recognition requirements in ASC 605, and most industry-specific guidance. The new standard requires that an entity recognize revenue to depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which the Company expects to be entitled in exchange for those goods or

services. The update also requires additional disclosure about the nature, amount, timing and uncertainty of revenue and cash flows arising from customer contracts, including significant judgments and changes in judgments and assets recognized from costs incurred to obtain or fulfill a contract. ASU 2014-09 is effective for fiscal years, and interim periods within those years, beginning after December 15, 2017 and should be applied retrospectively to each prior reporting period presented or retrospectively with the cumulative effect of initially applying this update recognized at the date of initial application. Early adoption is permitted beginning after December 15, 2016, including interim reporting periods within those years. In April 2016, the FASB issued ASU No. 2016-10*, Revenue from Contracts with Customers: Identifying Performance Obligations and Licensing* ("ASU 2016-10"), which clarifies certain aspects of identifying performance obligations and licensing implementation guidance. In May 2016, the FASB issued ASU No. 2016-12, *Revenue from Contracts with Customers: Narrow-Scope Improvements and Practical Expedients* ("ASU 2016-12"), related to disclosures of remaining performance obligations, as well as other amendments to guidance on collectability, non-cash consideration and the presentation of sales and other similar taxes collected from customers. These standards have the same effective date and transition date as ASU 2014-09. The Company is analyzing the potential impact that ASU 2014-09, ASU 2016-10 and ASU 2016-12 may have on its financial position and results of operations. This analysis of the Company's collaborative arrangements and license agreements includes, but is not limited to, reviewing variable consideration as it relates to its agreements, assessing potential disclosures and evaluating the impact of each potential method of adoption on the Company's consolidated financial statements. In addition, the Company continues to monitor additional changes, modifications, clarifications or interpretations undertaken by the FASB, which may impact its conclusions.

In August 2014, the FASB issued ASU No. 2014-15, *Presentation of Financial Statements - Going Concern: Disclosure of Uncertainties about an Entity's Ability to Continue as a Going Concern* ("ASU 2014-15"). ASU 2014-15 is intended to define management's responsibility to evaluate whether there is substantial doubt about an organization's ability to continue as a going concern and to provide related footnote disclosures, if required. ASU 2014-15 is effective for annual reporting periods ending after December 15, 2016, and applies to annual and interim periods thereafter. The Company adopted this standard during the three months ended December 31, 2016. The Company determined there was not substantial doubt about the organization's ability to continue as a going concern.

In April 2015, the FASB issued ASU No. 2015-05, *Customer's Accounting for Fees Paid in a Cloud Computing Arrangement*, which amends ASC 350. Under this standard, if a cloud computing arrangement includes a software license, the software license element of the arrangement should be accounted for consistent with the acquisition of other software licenses. If a cloud computing arrangement does not include a software license, the arrangement should be accounted for as a service contract. The amendments are effective for fiscal years, and interim periods within those years, beginning after December 15, 2015 and may be applied on either a prospective or retrospective basis. The Company adopted this standard during the three months ended March 31, 2016. The adoption of this standard did not have a material impact on the Company's financial position or results of operations for the year ended and as of December 31, 2016.

In July 2015, the FASB issued ASU No. 2015-11, *Inventory (Topic 330): Simplifying the Measurement of Inventory*. ASU 2015-11 requires that for entities that measure inventory using the first-in, first-out method, inventory should be measured at the lower of cost and net realizable value. The standard defines net realizable value as the estimated selling prices in the ordinary course of business, less reasonably predictable costs of completion, disposal and transportation. The standard is effective for fiscal years, and interim periods within those years, beginning after December 15, 2016. Early adoption is permitted. The Company adopted this standard during the three months ended December 31, 2016. The adoption of this standard did not have a material impact on the Company's financial position or results of operations for the year ended and as of December 31, 2016.

In February 2016, the FASB issued ASU No. 2016-02, *Leases* ("ASU 2016-02"), which supersedes the lease accounting requirements in ASC Topic 840, *Leases,* and most industry-specific guidance. ASU 2016-02 requires the identification of arrangements that should be accounted for as leases by lessees. In general, for lease arrangements exceeding a 12-month term, these arrangements must now be recognized as assets and liabilities on the balance sheet of the lessee. Under ASU 2016-02, a right-of-use asset and lease obligation will be recorded for all leases, whether operating or financing, while the income statement will reflect lease expense for operating leases and amortization and interest expense for financing leases. The balance sheet amount recorded for existing leases at the date of adoption of ASU 2016-02 must be calculated using the applicable incremental borrowing rate at the date of adoption. In addition, ASU 2016-02 requires the use of modified retrospective method, which will require adjustment to all comparative periods presented in the consolidated financial statements. ASU 2016-02 is effective for fiscal years beginning after

December 15, 2018, including interim periods within those fiscal years. Early adoption is permitted. The Company is evaluating the potential impact that ASU 2016-02 may have on the Company's financial position or results of operations for the year ended and as of December 31, 2016.

In March 2016, the FASB issued ASU No. 2016-09, *Compensation - Stock Compensation*, which amends ASC Topic 718, *Compensation - Stock Compensation* ("ASU 2016-09"). ASU 2016-09 identifies areas for simplification involving several aspects of accounting for share-based payment transactions, including the income tax consequences, classification of awards as either equity or liabilities, an option to recognize gross stock compensation expense with actual forfeitures recognized as they occur, as well as certain classifications on the statement of cash flows. The amendments are effective for annual periods beginning after December 15, 2016, and interim periods within those annual periods. Early adoption is permitted. The Company adopted this standard during the three months ended December 31, 2016. The adoption of this standard did not have a material impact on the Company's financial position or results of operations for the year ended and as of December 31, 2016.

In August 2016, the FASB issued ASU No. 2016-15, *Statement of Cash Flows (Topic 230): Classification of Certain Cash Receipts and Cash Payments* ("ASU 2016-15"). The new standard clarifies certain aspects of the statement of cash flows, including the classification of debt prepayment or debt extinguishment costs, contingent consideration payments made after a business combination, proceeds from the settlement of insurance claims, and distributions received from equity method investees and beneficial interests in securitization transactions. The new standard also clarifies that an entity should determine each separately identifiable source or use within the cash receipts and cash payments on the basis of the nature of the underlying cash flows. In situations in which cash receipts and payments have aspects of more than one class of cash flows and cannot be separated by source or use, the appropriate classification should depend on the activity that is likely to be the predominant source or use of cash flows for the item. The amendments are effective for annual periods beginning after December 15, 2017, and interim periods within those annual periods. Early adoption is permitted. The Company adopted this standard during the three months ended December 31, 2016. The adoption of this standard did not have a material impact on the Company's financial position or results of operations for the year ended and as of December 31, 2016.

In October 2016, the FASB issued ASU No. 2016-16, *Accounting for Income Taxes: Intra-Entity Asset Transfers of Assets Other than Inventory* ("ASU 2016-16"). ASU 2016-16 eliminates the ability to defer the tax expense related to intra-entity asset transfers other than Inventory. Under the new standard, entities should recognize the income tax consequences on an intra-entity transfer of an asset other than inventory when the transfer occurs. ASU 2016-16 is effective for fiscal periods beginning after December 15, 2018. Early adoption is permitted. The Company is evaluating the potential impact that the adoption of ASU 2016-16 will have on the Company's financial position or results of operations. The standard does not have a material impact on the Company's financial position or results of operations for the year ended and as of December 31, 2016.

In October 2016, the FASB issued No. ASU 2016-17, *Consolidation Topic 810: Interests held through Related Parties that are under Common Control* ("ASU 2016-17"), which amends how a decision maker is required to consider indirect interests in a variable interest entity held through an entity under common control. ASU 2016-17 is effective for fiscal years beginning after December 15, 2016, and interim periods within those years. Early adoption is permitted. The Company adopted this standard during the three months ended December 31, 2016. The adoption of this standard did not have a material impact on the Company's financial position or results of operations for the year ended and as of December 31, 2016.

In October 2016, the FASB ASU 2016-18, *Statement of Cash Flows (Topic 230) Restricted Cash* ("ASU 2016-18"), which requires that a statement of cash flows explain the change during the period in the total of cash, cash equivalents, and restricted cash or restricted cash equivalents. Therefore, amounts described as restricted cash and restricted cash equivalents should be included with cash and cash equivalents when reconciling the beginning-of-period and end-of-period total amounts shown on the statement of cash flows. ASU 2016-18 is effective for fiscal years beginning after December 15, 2017, and interim periods within those years. Early adoption is permitted. The Company is evaluating the potential impact that the adoption of ASU 2016-18 will have on the Company's financial position or results of operations.

In January 2017, the FASB ASU No. 2017-01, *Business Combinations (Topic 805): Clarifying the Definition of a Business* ("ASU 2017-01"), to clarify the definition of a business by adding guidance to assist entities with evaluating whether transactions should be accounted for as acquisitions or disposals of assets versus businesses. ASU 2017-01 is

effective for fiscal years beginning after December 15, 2017, and interim periods within those fiscal years. Early adoption is permitted. The Company is evaluating the potential impact that the adoption of ASU 2016-16 will have on the Company's financial position or results of operations.

No other accounting standards known by the Company to be applicable to it that have been issued or proposed by the FASB or other standard-setting bodies and that do not require adoption until a future date are expected to have a material impact on the Company's consolidated financial statements upon adoption.

3. Net Loss Per Share

The following table sets forth the computation of basic and diluted net loss per common share (in thousands, except per share amounts):

	Year Ended December 31,		
	2016	2015	2014
Numerator:			
Net Loss	$ (81,708)	$(142,669)	$ (189,618)
Denominator:			
Weighted average number of common shares used in net loss per share — basic and diluted	144,928	142,155	136,811
Net loss per share — basic and diluted	$ (0.56)	$ (1.00)	$ (1.39)

In June 2015, in connection with the issuance of approximately $335.7 million in aggregate principal amount of the 2022 Notes, the Company entered into the Convertible Note Hedges. The Convertible Note Hedges are generally expected to reduce the potential dilution to the Company's Class A common stockholders upon a conversion of the 2022 Notes and/or offset any cash payments the Company is required to make in excess of the principal amount of converted 2022 Notes in the event that the market price per share of the Company's Class A common stock, as measured under the terms of the Convertible Note Hedges, is greater than the conversion price of the 2022 Notes (Note 11). The Convertible Note Hedges are not considered for purposes of calculating the number of diluted weighted average shares outstanding, as their effect would be antidilutive.

Concurrently with entering into the Convertible Note Hedges, the Company also issued Note Hedge Warrants to the Convertible Note Hedge counterparties to acquire 20,249,665 shares of the Company's Class A common stock, subject to customary anti-dilution adjustments. The Note Hedge Warrants could have a dilutive effect on the Company's Class A common stock to the extent that the market price per share of the Class A common stock exceeds the applicable strike price of such warrants (Note 11). The Note Hedge Warrants are not considered for purposes of calculating the number of diluted weighted averages shares outstanding, as their effect would be antidilutive.

The following potentially dilutive securities have been excluded from the computation of diluted weighted average shares outstanding as their effect would be anti-dilutive (in thousands):

	Year Ended December 31,		
	2016	2015	2014
Options to purchase common stock	20,455	20,567	19,958
Shares subject to repurchase	94	74	99
Unvested shares from early option exercises	300	—	—
Restricted stock units	1,299	900	—
Note hedge warrants	20,250	20,250	—
2022 Notes	20,250	20,250	—
	62,648	62,041	20,057

An insignificant number of shares issuable under the Company's employee stock purchase plan were excluded from the calculation of diluted weighted average shares outstanding because their effects would be anti-dilutive.

4. Business Combinations

The Company closed the Lesinurad Transaction on June 2, 2016 (the "Acquisition Date") with AstraZeneca pursuant to which the Company received an exclusive license to develop, manufacture and commercialize in the U.S. products containing lesinurad as an active ingredient, including ZURAMPIC (the "Products"). Subject to the terms of the Lesinurad License, AstraZeneca is obligated to conduct certain development activities on the Company's behalf for (i) ZURAMPIC, including the post-marketing activities currently required by the FDA, for which the Company is obligated to reimburse AstraZeneca up to $100.0 million over up to ten years, and (ii) DUZALLO, for which the Company will also reimburse AstraZeneca. In connection with the Lesinurad License, the Company and AstraZeneca entered into the Lesinurad CSA, pursuant to which the Company relies exclusively on AstraZeneca for the commercial manufacture and supply of ZURAMPIC and, if approved, DUZALLO, and the Lesinurad TSA, pursuant to which AstraZeneca is providing certain support services, including development, regulatory and commercial services, to the Company for ZURAMPIC until such activities under the Lesinurad TSA are transferred to the Company. The Company may obtain production techniques from AstraZeneca via a manufacturing technology transfer available under the Lesinurad CSA upon provision of six-months' notice. The Company is responsible for commercialization of the Products in the U.S., and any additional development of the Products for commercialization in the U.S. In addition, under the terms of the Lesinurad License, the Company will have the right of first negotiation and right of last refusal with AstraZeneca for the right to commercialize, develop and manufacture for commercialization in the U.S., products for the prevention or treatment of gout that include verinurad as at least one of its active ingredients.

The Company concluded that the Lesinurad Transaction included inputs and processes that have the ability to create outputs and accordingly accounted for the transaction as a business combination in accordance with ASC 805. As such, the assets acquired and liabilities assumed were recorded at fair value, with the remaining purchase price recorded as goodwill.

The purchase price consists of the up-front payment to AstraZeneca of $100.0 million, which was made in June 2016, and the fair value of contingent consideration of approximately $67.9 million. In addition to the up-front payment, the Company will also pay a tiered royalty to AstraZeneca in the single-digits as a percentage of net sales of the Products in the U.S., as well as commercial and other milestones of up to $165.0 million over the duration of the Lesinurad License. As of the Acquisition Date, the contingent consideration fair value of approximately $67.9 million was calculated using a discounted cash flow estimate of expected future milestone and royalty payments to AstraZeneca based on the Company's internally forecasted net product revenue of ZURAMPIC and, if approved, DUZALLO. The fair value of contingent consideration in the purchase price includes initial measurement period adjustments further described below, as of the Acquisition Date. The Company also paid approximately $1.6 million in transaction-related costs, including external consulting fees, which were expensed as incurred as selling, general and administrative expenses.

The Company preliminarily valued the acquired assets and liabilities based on their estimated fair value as of the Acquisition Date upon closing the Lesinurad Transaction. The preliminary fair values included in the Company's consolidated balance sheets as of December 31, 2016 are based on the Company's best estimates. Certain of these estimates have been adjusted as additional information has become available related to conditions that existed as of the Acquisition Date. During the three months ended December 31, 2016, the Company recorded approximately $19.8 million in adjustments to the preliminary Acquisition Date valuation of the acquired assets and liabilities. These adjustments primarily related to changes in estimated cash flows associated with the commercialization of ZURAMPIC and if approved, DUZALLO. As a result of the adjustments to the Acquisition Date valuation of the acquired assets and liabilities recorded during the three months ended December 31, 2016, the fair value of the IPR&D - DUZALLO increased by approximately $126.0 million, the fair value of the developed technology – ZURAMPIC decreased by approximately $145.9 million, goodwill increased by an insignificant amount and contingent consideration decreased by approximately $19.8 million. The Company will continue to evaluate all information available, including the results of multiple ongoing market research projects, and further adjustments to the respective fair values of these items may be made if additional information becomes available regarding conditions that existed at the time of the acquisition, but such adjustments may be made no later than June 1, 2017. The completion of the valuation of the acquired assets and liabilities may result in additional adjustments to the carrying value of assets and liabilities, revision to the useful life of the finite intangible asset, the determination of any residual amount that will be allocated to goodwill and the related tax effects. The related amortization of acquired finite-lived intangible asset is also subject to revision based on the final valuation.

The following table presents the allocation of the purchase consideration for the Lesinurad Transaction as of the Acquisition Date, including the contingent consideration (in thousands) and approximately $19.8 million in measurement period adjustments recorded during the three months ended December 31, 2016:

As of the Acquisition Date:	
Cash portion of consideration	$ 100,000
Contingent consideration	67,885
Total purchase consideration	$ 167,885

As of the Acquisition Date:	
Developed technology — ZURAMPIC	$ 22,000
IPR&D - DUZALLO	145,100
Goodwill	785
Net assets acquired	$ 167,885

The fair value of the IPR&D - DUZALLO was determined using a probability adjusted discounted cash flow approach, including assumptions of projected revenues, operating expenses and a discount rate of 14.0% applied to the projected cash flows. The remaining cost of development for this asset was approximately $13.9 million as of the Acquisition Date, with an expected completion date of no later than December 31, 2017. Through December 31, 2016, the Company continued to incur costs related to DUZALLO.

The fair value of the developed technology - ZURAMPIC intangible asset was determined using a probability adjusted discounted cash flow approach, including assumptions of projected revenues, operating expenses and a discount rate of 12.5% applied to the projected cash flows. The Company considers the developed technology - ZURAMPIC intangible asset acquired to be developed technology, as it was approved by the FDA for commercialization as of the Acquisition Date. The Company believes the assumptions are representative of those a market participant would use in estimating fair value. The developed technology - ZURAMPIC intangible asset is finite lived. The amount allocated to the developed technology - ZURAMPIC intangible asset is being amortized on a straight-line basis to amortization of acquired intangible assets within the Company's consolidated statements of operations over its estimated useful life of approximately 13 years, the period of estimated future cash flows from the Acquisition Date. The Company believes that the straight-line method of amortization represents the pattern in which the economic benefits of the intangible asset are consumed. As of December 31, 2016, the Company recognized accumulated amortization of approximately $1.0 million with respect to the developed technology - ZURAMPIC intangible asset. The estimated future amortization of developed technology – ZURAMPIC intangible asset is expected to be as follows (in thousands):

	As of December 31, 2016
2017	$ 1,682
2018	1,682
2019	1,682
2020	1,682
2021 and thereafter	14,291
Total	$ 21,019

The amount allocated to the IPR&D- DUZALLO is considered to be indefinite-lived until the completion or abandonment of the associated research and development efforts. As of December 31, 2016, there was no impairment related to the IPR&D- DUZALLO or the developed technology - ZURAMPIC intangible asset.

The Company allocated the excess of the purchase price over the identifiable intangible assets to goodwill. Such goodwill is not deductible for tax purposes and represents the value placed on entering new markets, expanding market share and operating synergies. As of December 31, 2016, there was no impairment of goodwill. All goodwill has been assigned to the Company's single reporting unit, which is the single operating segment human therapeutics.

These fair value measurements were based on significant inputs not observable in the market and thus represent Level 3 fair value measurements (Note 6).

As of December 31, 2016, the estimated fair value of the Company's contingent consideration liability increased by approximately $9.8 million to approximately $77.7 million, compared to the Acquisition Date estimated

fair value primarily due to the passage of time and changes in the yield curve equivalent to the Company's credit risk, which was the estimated cost of debt financing for similar market participants used in the valuation.

5. Collaboration, License, Co-Promotion and Other Commercial Agreements

For the year ended December 31, 2016, the Company had linaclotide collaboration agreements with Allergan for North America and AstraZeneca for China, Hong Kong and Macau, as well as linaclotide license agreements with Allergan for the European territory (formerly with Almirall) and Astellas for Japan. The Company also had a co-promotion agreement with Exact Sciences to co-promote Cologuard in the U.S., which was terminated in August 2016, and a co-promotion agreement with Allergan to co-promote VIBERZI in the U.S. Additionally, the Company had the Lesinurad License with AstraZeneca for the development, manufacture and commercialization in the U.S. of products containing lesinurad. The following table provides amounts included in the Company's consolidated statements of operations as collaborative arrangements revenue attributable to transactions from these arrangements (in thousands):

	Collaborative Arrangements Revenue Year Ended December 31,		
	2016	2015	2014
Linaclotide Agreements:			
Allergan (North America)	$223,362	$134,335	$47,682
Allergan (Europe)[1]	406	—	—
AstraZeneca (China, Hong Kong and Macau)	370	2,370	3,417
Almirall (Europe)[1]	3	540	7,587
Astellas (Japan)	44,430	7,696	17,750
Co-Promotion Agreements:			
Exact Sciences (Cologuard)[2]	3,513	4,437	—
Allergan (VIBERZI)	1,764	177	—
Product Revenue - ZURAMPIC	109	—	—
Total collaborative arrangements revenue	$273,957	$149,555	$76,436

(1) In October 2015, Almirall transferred its exclusive license to develop and commercialize linaclotide in Europe to Allergan.

(2) In August 2016, the Company terminated the Cologuard Co-Promotion Agreement.

Linaclotide Agreements

Collaboration Agreement for North America with Allergan

In September 2007, the Company entered into a collaboration agreement with Allergan to develop and commercialize linaclotide for the treatment of IBS-C, CIC and other GI conditions in North America. Under the terms of this collaboration agreement, the Company shares equally with Allergan all development costs as well as net profits or losses from the development and sale of linaclotide in the U.S. The Company receives royalties in the mid-teens percent based on net sales in Canada and Mexico. Allergan is solely responsible for the further development, regulatory approval and commercialization of linaclotide in those countries and funding any costs. The collaboration agreement for North America also includes contingent milestone payments, as well as a contingent equity investment, based on the achievement of specific development and commercial milestones. At December 31, 2016, $205.0 million in license fees and all six development milestone payments had been received by the Company, as well as a $25.0 million equity investment in the Company's capital stock (Note 17). The Company can also achieve up to $100.0 million in a sales related milestone if certain conditions are met, which will be recognized as collaborative arrangements revenue as earned.

As a result of the research and development cost-sharing provisions of the linaclotide collaboration for North America, the Company offset approximately $7.3 million, approximately $16.9 million, and approximately $4.3 million against research and development costs during the years ended December 31, 2016, 2015 and 2014, respectively, to reflect the obligations of each party under the collaboration to bear half of the development costs incurred. In addition, in March 2015, the Company and Allergan agreed to share certain costs relating to the manufacturing of linaclotide API and certain other manufacturing activities for the North American territory. This arrangement resulted in net amounts

received from Allergan of approximately $4.3 million for costs incurred in prior periods, which were recorded by the Company as a reduction in research and development expenses during the year ended December 31, 2015.

The Company and Allergan began commercializing LINZESS in the U.S. in December 2012. The Company receives 50% of the net profits and bears 50% of the net losses from the commercial sale of LINZESS in the U.S.; provided, however, that if either party provides fewer calls on physicians in a particular year than it is contractually required to provide, such party's share of the net profits will be adjusted as set forth in the collaboration agreement for North America. During the years ended December 31, 2016 and 2015, certain of these adjustments to the share of the net profits were reduced or eliminated in connection with the co-promotion activities under the Company's agreement with Allergan to co-promote VIBERZI in the U.S., as described below in *Co-Promotion Agreement with Allergan for VIBERZI*. Additionally, certain of these adjustments to the share of the net profits are eliminated, in full, in 2018 and all subsequent years under the terms of the Company's commercial agreement with Allergan entered into in January 2017 under which the Company will promote Allergan's DELZICOL and CANASA products (Note 20). Net profits or net losses consist of net sales of LINZESS to third-party customers and sublicense income in the U.S. less the cost of goods sold as well as selling, general and administrative expenses. LINZESS net sales are calculated and recorded by Allergan and may include gross sales net of discounts, rebates, allowances, sales taxes, freight and insurance charges, and other applicable deductions. The Company records its share of the net profits or net losses from the sale of LINZESS on a net basis and presents the settlement payments to and from Allergan as collaboration expense or collaborative arrangements revenue, as applicable.

The Company recognized collaborative arrangements revenue from the Allergan collaboration agreement for North America during the years ended December 31, 2016, 2015 and 2014 as follows (in thousands):

	Year Ended December 31,		
	2016	2015	2014
Collaborative arrangements revenue related to sales of LINZESS in the U.S.	$ 217,726	$ 133,425	$ 47,618
Sale of API	4,482	—	—
Royalty revenue	1,154	910	64
Total collaborative arrangements revenue	$ 223,362	$ 134,335	$ 47,682

The collaborative arrangements revenue recognized in the years ended December 31, 2016, 2015 and 2014 primarily represents the Company's share of the net profits and net losses on the sale of LINZESS in the U.S. In addition, during the year ended December 31, 2016, the Company recorded collaboration revenue of approximately $4.5 million related to the sale of API to Allergan under the terms of the linaclotide collaboration for North America. The Company recorded no collaboration revenue related to the sale of API to Allergan during the years ended December 31, 2015, and 2014.

The following table presents the amounts recorded by the Company for commercial efforts related to LINZESS in the U.S. in the years ended December 31, 2016, 2015 and 2014 (in thousands):

	Year Ended December 31,		
	2016	2015	2014
Collaborative arrangements revenue related to sales of LINZESS in the U.S.[1][2]	$217,726	$133,425	$ 47,618
Selling, general and administrative costs incurred by the Company[1]	(35,197)	(32,028)	(31,646)
The Company's share of net profit	$182,529	$101,397	$ 15,972

(1) Includes only collaborative arrangement revenue or selling, general and administrative costs attributable to the cost-sharing arrangement with Allergan.

(2) Certain of the unfavorable adjustments to the Company's share of the LINZESS net profits were reduced or eliminated in connection with the co-promotion activities under the Company's agreement with Allergan to co-promote VIBERZI in the U.S., as described below in *Co-Promotion Agreement with Allergan for VIBERZI*.

In May 2014, CONSTELLA became commercially available in Canada and in June 2014, LINZESS became commercially available in Mexico. In October 2015, Almirall and Allergan terminated the sublicense arrangement with respect to Mexico, returning the exclusive rights to commercialize CONSTELLA in Mexico to Allergan. CONSTELLA

continues to be available to adult IBS-C patients in Mexico. The Company records royalties on sales of CONSTELLA in Canada and LINZESS in Mexico one quarter in arrears as it does not have access to the royalty reports from its partner or the ability to estimate the royalty revenue in the period earned. The Company recognized approximately $1.2 million, approximately $0.9 million, and an insignificant amount of royalty revenues from Canada and Mexico during the years ended December 31, 2016, 2015 and 2014, respectively.

License Agreement for the European Territory with Allergan (formerly with Almirall through October 2015)

In April 2009, the Company entered into a license agreement with Almirall (the "European License Agreement") to develop and commercialize linaclotide in Europe (including the Commonwealth of Independent States and Turkey) for the treatment of IBS-C, CIC and other GI conditions. Under the terms of the European License Agreement, Almirall was responsible for the expenses associated with the development and commercialization of linaclotide in the European territory and the Company was required to participate on a joint development committee over linaclotide's development period and a joint commercialization committee while the product was being commercialized.

Pursuant to the terms of the European License Agreement, in May 2009 the Company received approximately $38.0 million, net of foreign tax withholdings, as a non-refundable up-front payment from Almirall. In November 2009, the Company achieved a development milestone triggering an equity investment and received $15.0 million from Almirall for the purchase of 681,819 shares of convertible preferred stock (Note 17).

In addition, the European License Agreement with Almirall included contingent milestone payments that could total up to $40.0 million upon achievement of specific development and commercial launch milestones. In November 2010, the Company achieved a development milestone, which resulted in an approximately $19.0 million payment, representing a $20.0 million milestone, net of foreign withholding taxes. This development milestone was recognized as collaborative arrangements revenue through September 2012, the period over which linaclotide was developed under the European License Agreement with Almirall. Commercial milestone payments under the European License Agreement with Almirall, as modified, consisted of approximately $4.0 million which became due upon the first commercial launch in four of the five major European Union ("E.U.") countries set forth in the agreement, which includes approximately $2.0 million during the second quarter of 2013 and approximately $1.0 million during each of the first and second quarters of 2014. In connection with the achievement of these milestones, the Company received approximately $3.9 million, net of foreign tax withholdings, which includes approximately $1.9 million during the second quarter of 2013 and approximately $1.0 million during each of the first and second quarters of 2014. The European License Agreement with Almirall also included escalating royalties based on sales of linaclotide in the low twenties percent reduced by the transfer price paid for the API included in the product actually sold in the Almirall territory and other contractual deductions.

In October 2015, Almirall transferred its exclusive license to develop and commercialize linaclotide in Europe to Allergan. Additionally, in October 2015, the Company and Allergan separately entered into an amendment to the European License Agreement relating to the development and commercialization of linaclotide in Europe. Pursuant to the terms of the amendment, (i) the remaining sales-based milestones payable to the Company under the European License Agreement were modified to increase the total milestone payments such that, when aggregated with the remaining commercial launch milestones, they could total up to $42.5 million, (ii) the royalties payable to the Company during the term of the European License Agreement were modified such that the royalties based on sales volume in Europe begin in the mid-single digit percent and escalate to the upper-teens percent by calendar year 2019, and (iii) Allergan assumed responsibility for the manufacturing of linaclotide API for Europe from the Company, as well as the associated costs. Furthermore, with the Company no longer responsible for the manufacturing of linaclotide API for Europe, the royalties under the European License Agreement are no longer reduced by the transfer price paid for the API included in the product actually sold by Allergan in Europe in any given period. The Company concluded that the 2015 amendment to the European License Agreement was not a modification to the linaclotide collaboration agreement with Allergan for North America.

The commercial launch and sales based milestones under the European License Agreement are recognized as revenue as earned. The Company recognized approximately $0.4 million and approximately $0.5 million in royalty revenue during the years ended December 31, 2016 and 2015, respectively. The Company recognized approximately $7.6 million in total collaborative arrangements revenue from the European License Agreement during the year ended December 31, 2014, including approximately $5.1 million from the sale of API to Almirall, approximately $1.9 million in commercial launch milestones, and approximately $0.6 million in royalty revenue. The Company records royalties on

sales of CONSTELLA one quarter in arrears as it does not have access to the royalty reports from Allergan or the ability to estimate the royalty revenue in the period earned.

In January 2017, the Company and Allergan entered into an amendment to the European License Agreement (Note 20).

License Agreement for Japan with Astellas

In November 2009, the Company entered into a license agreement with Astellas, as amended, to develop and commercialize linaclotide for the treatment of IBS-C, CIC and other GI conditions in Japan. Astellas is responsible for all activities relating to development, regulatory approval and commercialization in Japan as well as funding the associated costs and the Company is required to participate on a joint development committee over linaclotide's development period.

In 2009, Astellas paid the Company a non-refundable, up-front licensing fee of $30.0 million, which was recognized as collaborative arrangements revenue on a straight-line basis over the Company's estimate of the period over which linaclotide was developed under the license agreement. In March 2013 and September 2016, the Company revised its estimate of the development period from 115 months to 85 months and from 85 months to 82 months, respectively, based on the Company's assessment of regulatory approval timelines for Japan. During the year ended December 31, 2016, the Company recognized approximately $6.3 million of revenue related to the up-front licensing fee. The revenue recognized during the year ended December 31, 2016 includes approximately $1.9 million of revenue attributable to a revision to the estimated development period in March 2013 and an additional approximately $1.3 million of revenue attributable to a revision to the estimated development period in September 2016. During the years ended December 31, 2015 and 2014, the Company recognized approximately $5.1 million of revenue in each period related to the up-front licensing fee, including approximately $1.9 million of revenue in each period attributable to the March 2013 revision to the estimated development period.

The agreement also includes three development milestone payments that totaled up to $45.0 million, none of which the Company considers substantive. The first milestone payment, consisting of $15.0 million upon enrollment of the first study subject in a Phase III study for linaclotide in Japan, was achieved in November 2014 and was recognized as revenue through December 31, 2016, including approximately $2.7 million, approximately $2.1 million and approximately $10.2 million during the years ended December 31, 2016, 2015 and 2014, respectively. In February 2016, Astellas filed an NDA with the Japanese Ministry of Health, Labor and Welfare seeking approval of linaclotide for the treatment of adults with IBS-C in Japan. In connection with this filing, a second milestone payment, consisting of $15.0 million, was achieved and was recognized as revenue during the year ended December 31, 2016. The third development milestone payment consisting of $15.0 million upon approval of an NDA by the Japanese Ministry of Health, Labor and Welfare to market linaclotide in Japan was also earned and recognized as revenue during the year ended December 31, 2016. In addition, the Company will receive royalties which escalate based on sales volume, beginning in the low twenties percent, less the transfer price paid for the API included in the product actually sold and other contractual deductions.

During the years ended December 31, 2016, 2015 and 2014, the Company recognized approximately $44.4 million, approximately $7.7 million, and approximately $17.7 million, respectively, in collaborative arrangements revenue from the Astellas license agreement, including approximately $5.4 million, approximately $0.5 million, and approximately $2.4 million, respectively, from the sale of API to Astellas.

Collaboration Agreement for China, Hong Kong and Macau with AstraZeneca

In October 2012, the Company entered into a collaboration agreement with AstraZeneca (the "AstraZeneca Collaboration Agreement") to co-develop and co-commercialize linaclotide in China, Hong Kong and Macau (the "License Territory"). The collaboration provides AstraZeneca with an exclusive nontransferable license to exploit the underlying technology in the License Territory. The parties share responsibility for continued development and commercialization of linaclotide under a joint development plan and a joint commercialization plan, respectively, with AstraZeneca having primary responsibility for the local operational execution.

The parties agreed to an Initial Development Plan ("IDP") which includes the planned development of linaclotide in China, including the lead responsibility for each activity and the related internal and external costs. The

IDP indicates that AstraZeneca is responsible for a multinational Phase III clinical trial (the "Phase III Trial"), the Company is responsible for nonclinical development and supplying clinical trial material and both parties are responsible for the regulatory submission process. The IDP indicates that the party specifically designated as being responsible for a particular development activity under the IDP shall implement and conduct such activities. The activities are governed by a Joint Development Committee ("JDC"), with equal representation from each party. The JDC is responsible for approving, by unanimous consent, the joint development plan and development budget, as well as approving protocols for clinical studies, reviewing and commenting on regulatory submissions, and providing an exchange of data and information.

The AstraZeneca Collaboration Agreement will continue until there is no longer a development plan or commercialization plan in place, however, it can be terminated by AstraZeneca at any time upon 180 days' prior written notice. Under certain circumstances, either party may terminate the AstraZeneca Collaboration Agreement in the event of bankruptcy or an uncured material breach of the other party. Upon certain change in control scenarios of AstraZeneca, the Company may elect to terminate the AstraZeneca Collaboration Agreement and may re-acquire its product rights in a lump sum payment equal to the fair market value of such product rights.

In connection with the AstraZeneca Collaboration Agreement, the Company and AstraZeneca also executed a co-promotion agreement (the "Co-Promotion Agreement"), pursuant to which the Company utilized its existing sales force to co-promote NEXIUM® (esomeprazole magnesium), one of AstraZeneca's products, in the U.S. The Co-Promotion Agreement expired in May 2014.

There are no refund provisions in the AstraZeneca Collaboration Agreement and the Co-Promotion Agreement (together, the "AstraZeneca Agreements").

Under the terms of the AstraZeneca Collaboration Agreement, the Company received a $25.0 million non-refundable up-front payment upon execution. The Company is also eligible for $125.0 million in additional commercial milestone payments contingent on the achievement of certain sales targets. The parties will also share in the net profits and losses associated with the development and commercialization of linaclotide in the License Territory, with AstraZeneca receiving 55% of the net profits or incurring 55% of the net losses until a certain specified commercial milestone is achieved, at which time profits and losses will be shared equally thereafter.

Activities under the AstraZeneca Agreements were evaluated in accordance with ASC Topic 605-25, *Revenue Recognition—Multiple-Element Arrangements,* or ASC 605-25, to determine if they represented a multiple element revenue arrangement. The Company identified the following deliverables in the AstraZeneca Agreements:

- an exclusive license to develop and commercialize linaclotide in the License Territory (the "License Deliverable"),
- research, development and regulatory services pursuant to the IDP, as modified from time to time (the "R&D Services"),
- JDC services,
- obligation to supply clinical trial material, and
- co-promotion services for AstraZeneca's product (the "Co-Promotion Deliverable").

The License Deliverable is nontransferable and has certain sublicense restrictions. The Company determined that the License Deliverable had standalone value as a result of AstraZeneca's internal product development and commercialization capabilities, which would enable it to use the License Deliverable for its intended purposes without the involvement of the Company. The remaining deliverables were deemed to have standalone value based on their nature and all deliverables met the criteria to be accounted for as separate units of accounting under ASC 605-25. Factors considered in this determination included, among other things, whether any other vendors sell the items separately and if the customer could use the delivered item for its intended purpose without the receipt of the remaining deliverables.

The Company identified the supply of linaclotide drug product for commercial requirements and commercialization services as contingent deliverables because these services are contingent upon the receipt of regulatory approval to commercialize linaclotide in the License Territory, and there were no binding commitments or firm purchase orders pending for commercial supply at the inception of the AstraZeneca Collaboration Agreement. As these deliverables are contingent, and are not at an incremental discount, they are not evaluated as deliverables at the inception of the arrangement. These contingent deliverables will be evaluated and accounted for separately as each related contingency is resolved. As of December 31, 2016, no contingent deliverables were provided by the Company under the AstraZeneca Agreements.

In August 2014, the Company and AstraZeneca, through the JDC, modified the IDP and development budget to include approximately $14.0 million in additional activities over the remaining development period, to be shared by the Company and AstraZeneca under the terms of the AstraZeneca Collaboration Agreement. These additional activities serve to support the continued development of linaclotide in the License Territory, including the Phase III Trial. Pursuant to the terms of the modified IDP and development budget, certain of the Company's deliverables were modified, specifically the R&D Services and the obligation to supply clinical trial material. The modification did not, however, have a material impact on the Company's consolidated financial statements.

The total amount of the non-contingent consideration allocable to the AstraZeneca Agreements was approximately $34.0 million ("Arrangement Consideration") which includes the $25.0 million non-refundable up-front payment and approximately $9.0 million representing 55% of the costs for clinical trial material supply services and research, development and regulatory activities allocated to the Company in the IDP or as approved by the JDC in subsequent periods.

The Company allocated the Arrangement Consideration to the non-contingent deliverables based on management's best estimated selling price ("BESP") of each deliverable using the relative selling price method, as the Company did not have vendor-specific objective evidence or third-party evidence of selling price for such deliverables. Of the total Arrangement Consideration, approximately $29.7 million was allocated to the License Deliverable, approximately $1.8 million to the R&D Services, approximately $0.1 million to the JDC services, approximately $0.3 million to the clinical trial material supply services, and approximately $2.1 million to the Co-Promotion Deliverable in the relative selling price model, at the time of the material modification.

Because the Company shares development costs with AstraZeneca, payments from AstraZeneca with respect to both research and development and selling, general and administrative costs incurred by the Company prior to the commercialization of linaclotide in the License Territory are recorded as a reduction in expense, in accordance with the Company's policy, which is consistent with the nature of the cost reimbursement. Development costs incurred by the Company that pertain to the joint development plan and subsequent amendments to the joint development plan, as approved by the JDC, are recorded as research and development expense as incurred. Payments to AstraZeneca are recorded as incremental research and development expense.

The Company completed its obligations related to the License Deliverable upon execution of the AstraZeneca Agreements; however, the revenue recognized in the statement of operations was limited to the non-contingent portion of the License Deliverable consideration in accordance with ASC 605-25. During the years ended December 31, 2016, 2015 and 2014, the Company recognized approximately $0.4 million, approximately $2.2 million and approximately $2.5 million, respectively, in collaborative arrangements revenue related to the License Deliverable in connection with the modification to the IDP and development budget in August 2014, as such this portion of the Arrangement Consideration was no longer contingent.

The Company also performs R&D Services and JDC services, and supplies clinical trial materials during the estimated development period. All Arrangement Consideration allocated to such services is being recognized as a reduction of research and development costs, using the proportional performance method, by which the amounts are recognized in proportion to the costs incurred. As a result of the cost-sharing arrangements under the collaboration, the Company recognized an insignificant reduction in research and development costs during the year ended December 31, 2016. During the years ended December 31, 2015 and 2014, the Company recognized approximately $0.7 million and approximately $2.4 million in incremental research and development costs, respectively. The amount allocated to the Co-Promotion Deliverable was recognized as collaborative arrangements revenue using the proportional performance method, which approximates recognition on a straight-line basis beginning on the date that the Company began to co-promote AstraZeneca's product through December 31, 2013 (the earliest cancellation date). As of December 31, 2013,

the Company completed its obligation related to the Co-Promotion Deliverable; however, the revenue recognized in the statement of operations was limited to the non-contingent consideration in accordance with ASC 605-25. During the years ended December 31, 2016, 2015 and 2014, the Company recognized an insignificant amount, approximately $0.2 million and approximately $0.9 million, respectively, as collaborative arrangements revenue related to this deliverable, as this portion of the Arrangement Consideration was no longer contingent.

The Company reassesses the periods of performance for each deliverable at the end of each reporting period.

Milestone payments received from AstraZeneca upon the achievement of sales targets will be recognized as earned.

Co-Promotion Agreements

Co-Promotion Agreement with Exact Sciences Corp. for Cologuard

In March 2015, the Company and Exact Sciences entered into an agreement to co-promote Exact Sciences' Cologuard, the first and only FDA-approved noninvasive stool DNA screening test for colorectal cancer (the "Exact Sciences Co-Promotion Agreement"). The Exact Sciences Co-Promotion Agreement was terminated by the parties in August 2016. Under the terms of the non-exclusive Exact Sciences Co-Promotion Agreement, the Company's sales team promoted and educated health care practitioners regarding Cologuard through July 2016, with LINZESS remaining the Company's first-position product. Exact Sciences maintained responsibility for all other aspects of the commercialization of Cologuard outside of the co-promotion. Under the terms of the Exact Sciences Co-Promotion Agreement, the Company is compensated primarily via royalties earned on the net sales of Cologuard generated from the healthcare practitioners on whom the Company called with such royalties being payable through July 2017. There are no refund provisions in the Exact Sciences Co-Promotion Agreement. Through December 31, 2016, the Company received approximately $3.4 million in connection with the Exact Sciences Co-Promotion Agreement.

Activities under the Exact Sciences Co-Promotion Agreement were evaluated in accordance with ASC 605-25, to determine if they represented a multiple element revenue arrangement. The Company identified the following deliverables in the Exact Sciences Co-Promotion Agreement through July 31, 2016: (i) second position sales detailing, (ii) promotional support services, and (iii) medical education services. Each of the deliverables was deemed to have standalone value based on their nature and all deliverables met the criteria to be accounted for as separate units of accounting under ASC 605-25. The Company determined that the BESP for each of the three deliverables approximated the value allocated to the deliverables under the agreement. The revenue related to each deliverable is recognized as collaborative arrangements revenue in the Company's consolidated statement of operations, in accordance with ASC 605-25, during the period earned. During the years ended December 31, 2016 and 2015, the Company recognized approximately $3.5 million and approximately $4.4 million as collaborative arrangements revenue related to this arrangement.

Co-Promotion Agreement with Allergan for VIBERZI

In August 2015, the Company and Allergan entered into an agreement for the co-promotion of VIBERZI in the U.S., Allergan's treatment for adults suffering from IBS-D (the "VIBERZI Co-Promotion Agreement"). Under the terms of the VIBERZI Co-Promotion Agreement, the Company's clinical sales specialists are detailing VIBERZI to the approximately 25,000 health care practitioners to whom they detail LINZESS. Allergan is responsible for all costs and activities relating to the commercialization of VIBERZI outside of the co-promotion.

Under the terms of the VIBERZI Co-Promotion Agreement, the Company's promotional efforts are compensated based on the volume of calls delivered by the Company's sales force, with the terms of the agreement reducing or eliminating certain of the unfavorable adjustments to the Company's share of net profits stipulated by the linaclotide collaboration agreement with Allergan for North America, provided that the Company provides a minimum number of VIBERZI calls on physicians. The Company has the potential to achieve milestone payment of up to $10.0 million based on the net sales of VIBERZI in each of 2017 and 2018, and is also compensated via reimbursements for medical education initiatives.

The Company's promotional efforts under the non-exclusive co-promotion began when VIBERZI became commercially available in December 2015, and will continue until December 31, 2017, unless earlier terminated by

either party pursuant to the provisions of the VIBERZI Co-Promotion Agreement. Either party may also terminate the VIBERZI Co-Promotion Agreement in the event of an uncured material breach by the other party, withdrawal of necessary approvals by the FDA, for convenience, or bankruptcy or insolvency of the other party. Allergan may terminate the VIBERZI Co-Promotion Agreement if the Company does not provide the minimum number of calls on physicians for VIBERZI.

Activities under the VIBERZI Co-Promotion Agreement were evaluated in accordance with ASC 605-25 to determine if they represented a multiple element revenue arrangement. The Company concluded that the VIBERZI Co-Promotion Agreement does not represent a material modification to the linaclotide collaboration agreement with Allergan for North America, as it is not material to the total arrangement consideration under the collaboration agreement, does not significantly modify the existing deliverables, and does not significantly change the term of the agreement. The Company identified the following deliverables in the VIBERZI Co-Promotion Agreement: (i) second position sales detailing of VIBERZI, and (ii) medical education services. Each of the deliverables was deemed to have standalone value based on their nature and both deliverables met the criteria to be accounted for as separate units of accounting under ASC 605-25. The Company determined the BESP for each of the deliverables approximated the value allocated to the deliverables under the agreement. As consideration is earned over the term of the agreement, the revenue will be allocated to each deliverable based on the relative selling price, using management's BESP, and recognized as collaborative arrangements revenue in the Company's consolidated statement of operations, in accordance with ASC 605-25, during the quarter earned.

Under the linaclotide collaboration agreement for North America with Allergan, if either party provides fewer calls on physicians in a particular year than it is contractually required to provide, such party's share of the net profits will be adjusted as set forth in the agreement; however, certain of these adjustments to the share of the net profits may be reduced or eliminated in connection with the co-promotion activities under the VIBERZI Co-Promotion Agreement through December 31, 2017. In connection with these co-promotion activities, the net profit share adjustments payable to Allergan under the linaclotide collaboration agreement for North America were reduced by approximately $5.3 million during the year ended December 31, 2016 and approximately $2.9 million during the year ended December 31, 2015. During the three months ended September 30, 2016, the Company also met the requirement for the minimum number of VIBERZI calls on physicians for 2016, which resulted in the Company's reversal of an approximately $2.4 million unfavorable adjustment previously recorded to collaborative arrangements revenue related to the linaclotide collaboration agreement with Allergan for North America. This approximately $2.4 million adjustment was originally recorded as an unfavorable adjustment to collaborative arrangements revenue during the six months ended June 30, 2015. During the years ended December 31, 2016 and 2015, the Company also recognized approximately $1.8 million and approximately $0.2 million in revenue related to the VIBERZI Co-Promotion Agreement for the performance of medical education services.

Other Collaboration and License Agreements

The Company has other collaboration and license agreements that are not individually significant to its business. Pursuant to the terms of one agreement, the Company may be required to pay $7.5 million for development milestones, of which, approximately $2.5 million had been paid as of December 31, 2016, and $18.0 million for regulatory milestones, none of which had been paid as of December 31, 2016. In addition, pursuant to the terms of another agreement, the contingent milestones could total up to $114.5 million per product to one of the Company's collaboration partners, including $21.5 million for development milestones, $58.0 million for regulatory milestones and $35.0 million for sales-based milestones. Further, under such agreements, the Company is also required to fund certain research activities and, if any product related to these collaborations is approved for marketing, to pay significant royalties on future sales. The Company did not record any research and development expense associated with the Company's other collaboration and license agreements during the year ended December 31, 2016. During the year ended December 31, 2015, the Company incurred an insignificant amount in research and development expense associated with the Company's other collaboration and license agreements. During the year ended December 31, 2014, the Company incurred approximately $1.0 million in research and development expense associated with the Company's other collaboration and license agreements.

Product Revenue

In October 2016, ZURAMPIC became commercially available in the U.S. During the year ended December 31, 2016, the Company recognized an insignificant amount of revenue related to product sales of ZURAMPIC in the U.S.

This revenue is included as part of collaborative arrangements revenue on the Company's consolidated statements of operations.

6. Fair Value of Financial Instruments

The tables below present information about the Company's assets that are measured at fair value on a recurring basis as of December 31, 2016 and 2015 and indicate the fair value hierarchy of the valuation techniques the Company utilized to determine such fair value. In general, fair values determined by Level 1 inputs utilize observable inputs such as quoted prices in active markets for identical assets or liabilities. Fair values determined by Level 2 inputs utilize data points that are either directly or indirectly observable, such as quoted prices for similar instruments in active markets, interest rates and yield curves. Fair values determined by Level 3 inputs utilize unobservable data points in which there is little or no market data, which require the Company to develop its own assumptions for the asset or liability.

The Company's investment portfolio includes mainly fixed income securities that do not always trade on a daily basis. As a result, the pricing services used by the Company apply other available information as applicable through processes such as benchmark yields, benchmarking of like securities, sector groupings and matrix pricing to prepare valuations. In addition, model processes are used to assess interest rate impact and develop prepayment scenarios. These models take into consideration relevant credit information, perceived market movements, sector news and economic events. The inputs into these models may include benchmark yields, reported trades, broker-dealer quotes, issuer spreads and other relevant data. The Company validates the prices provided by its third party pricing services by obtaining market values from other pricing sources and analyzing pricing data in certain instances.

The following tables present the assets and liabilities the Company has measured at fair value on a recurring basis (in thousands):

		Fair Value Measurements at Reporting Date Using		
	December 31, 2016	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Assets:				
Cash and cash equivalents:				
Money market funds	$ 32,486	$ 32,486	$ —	$ —
Available-for-sale securities:				
U.S. Treasury securities	115,021	115,021	—	—
U.S. government-sponsored securities	136,191	—	136,191	—
Convertible Note Hedges	132,521	—	—	132,521
Total assets measured at fair value	$ 416,219	$ 147,507	$ 136,191	$ 132,521
Liabilities:				
Note Hedge Warrants	$ 113,237	$ —	$ —	$ 113,237
Contingent Consideration	77,660	—	—	77,660
Total liabilities measured at fair value	$ 190,897	$ —	$ —	$ 190,897

	December 31, 2015	Fair Value Measurements at Reporting Date Using: Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Assets:				
Cash and cash equivalents:				
Money market funds	$ 254,903	$ 254,903	$ —	$ —
U.S. government-sponsored securities	3,340	—	3,340	—
Available-for-sale securities:				
U.S. Treasury securities	50,091	50,091	—	—
U.S. government-sponsored securities	128,016	—	128,016	—
Convertible Note Hedges	86,466	—	—	86,466
Total assets measured at fair value	$ 522,816	$ 304,994	$ 131,356	$ 86,466
Liabilities:				
Note Hedge Warrants	$ 75,328	$ —	$ —	$ 75,328
Total liabilities measured at fair value	$ 75,328	$ —	$ —	$ 75,328

There were no transfers between fair value measurement levels during the years ended December 31, 2016 or 2015.

Cash equivalents, accounts receivable, related party accounts receivable, prepaid expenses and other current assets, accounts payable, related party accounts payable, accrued expenses and the current portion of capital lease obligations at December 31, 2016 and 2015 are carried at amounts that approximate fair value due to their short-term maturities.

The non-current portion of the capital lease obligations at December 31, 2016 and 2015 approximates fair value as it bears interest at a rate approximating a market interest rate.

Convertible Note Hedges and Note Hedge Warrants

The Company's Convertible Note Hedges and the Note Hedge Warrants are recorded as derivative assets and liabilities, and are classified as Level 3 under the fair value hierarchy. These derivatives are not actively traded and are valued using the Black-Scholes option-pricing model which requires the use of subjective assumptions. Significant inputs used to determine the fair value as of December 31, 2016 included the price per share of the Company's Class A common stock, time to maturity of the derivative instruments, the strike prices of the derivative instruments, the risk-free interest rate, and the volatility of the Company's Class A common stock. The Company has not paid and does not anticipate paying cash dividends on its shares of common stock in the foreseeable future; therefore, the expected dividend yield is assumed to be zero. Changes to these inputs could materially affect the valuation of the Convertible Note Hedges and Note Hedge Warrants.

The following inputs were used in the fair market valuation of the Convertible Note Hedges and Note Hedge Warrants as of December 31, 2016 and 2015:

	2016		2015	
	Convertible Note Hedges	Note Hedge Warrants	Convertible Note Hedges	Note Hedge Warrants
Risk-free interest rate [1]	2.0 %	2.1 %	2.0 %	2.1 %
Time to maturity	5.5	6.0	6.5	7.0
Stock price [2]	$ 15.29	$ 15.29	$ 11.59	$ 11.59
Strike price [3]	$ 16.58	$ 21.50	$ 16.58	$ 21.50
Common stock volatility [4]	47.4 %	45.8 %	45.0 %	45.0 %
Dividend yield	— %	— %	— %	— %

(1) Based on U.S. Treasury yield curve, with terms commensurate with the terms of the Convertible Note Hedges and the Note Hedge Warrants

(2) The closing price of the Company's Class A common stock on the last trading day of the year ended December 31, 2016 and December 31, 2015, respectively.
(3) As per the respective agreements for the Convertible Note Hedges and Note Hedge Warrants.
(4) Selected volatility based on historical volatility and implied volatility of the Company's Class A common stock.

The Convertible Note Hedges and the Note Hedge Warrants are recorded at fair value at each reporting period and changes in fair value are recorded in other expense, net within the Company's consolidated statements of operations. Gains and losses for these derivative financial instruments are presented separately in the Company's consolidated statements of cash flows.

The following table reflects the change in the Company's Level 3 convertible note derivatives from their initial value at issuance through December 31, 2016 (in thousands):

	Convertible Note Hedges	Note Hedge Warrants
Balance at December 31, 2014	$ —	$ —
Issuance of Note Hedge Warrants	—	(70,849)
Purchase of Convertible Note Hedges	91,915	—
Change in fair value, recorded as a component of gain (loss) on derivatives	(5,449)	(4,479)
Balance at December 31, 2015	$ 86,466	$ (75,328)
Change in fair value, recorded as a component of gain (loss) on derivatives	46,055	(37,909)
Balance at December 31, 2016	$ 132,521	$ (113,237)

Contingent Consideration

In connection with the Lesinurad Transaction, the Company recorded a liability of $87.6 million as of the Acquisition Date, representing the initial fair value of the contingent consideration. Subsequently, the Company recorded a decrease of approximately $19.8 million as part of a measurement period adjustment to the Acquisition Date fair value. This valuation was based on a Monte-Carlo simulation, which includes significant estimates related to probability weighted net cash outflow projections, discounted using a yield curve equivalent to the Company's credit risk, which was the estimated cost of debt financing for market participants. This estimate represents the probability weighted analysis of expected future milestone and royalty payments based on net sales to be made to AstraZeneca. Changes to these inputs are re-evaluated each reporting period and could materially affect the valuation of the contingent consideration. The estimated fair value of contingent consideration was approximately $77.7 million as of December 31, 2016.

The following table reflects the change in the Company's Level 3 contingent consideration payable from December 31, 2015 through December 31, 2016 (in thousands):

	Contingent Consideration
Fair value at December 31, 2015	$ —
Additions [1]	67,885
Changes in fair value	9,831
Payments/transfers to accrued expenses and other current liabilities	(56)
Fair value at December 31, 2016	$ 77,660

(1) Includes approximately $19.8 million in measurement period adjustments to the Acquisition Date fair value recorded during the year ended December 31, 2016.

11% PhaRMA Notes

In January 2013, the Company closed a private placement of $175.0 million in aggregate principal amount of the PhaRMA Notes due on or before June 15, 2024. The estimated fair value of the PhaRMA Notes was approximately $134.9 million and approximately $166.8 million as of December 31, 2016 and 2015, respectively, and was determined using Level 3 inputs, including a quoted rate.

2.25% Convertible Senior Notes

In June 2015, the Company issued approximately $335.7 million of its 2022 Notes. The Company separately accounted for the liability and equity components of the 2022 Notes by allocating the proceeds between the liability component and equity component (Note 11). The fair value of the 2022 Notes, which differs from their carrying value, is influenced by interest rates, the price of the Company's Class A common stock and the volatility thereof, and the prices for the 2022 Notes observed in market trading, which are Level 2 inputs. The estimated fair value of the 2022 Notes as of December 31, 2016 and 2015 was approximately $384.2 million and approximately $311.6 million, respectively.

7. Available-for-Sale Securities

The following tables summarize the available-for-sale securities held at December 31, 2016 and 2015 (in thousands):

	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value
December 31, 2016				
U.S. Treasury securities	$ 115,026	$ 6	$ (11)	$ 115,021
U.S. government-sponsored securities	136,193	10	(12)	136,191
Total	$ 251,219	$ 16	$ (23)	$ 251,212

	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value
December 31, 2015				
U.S. Treasury securities	$ 50,124	$ —	$ (33)	$ 50,091
U.S. government-sponsored securities	128,069	2	(55)	128,016
Total	$ 178,193	$ 2	$ (88)	$ 178,107

The contractual maturities of all securities held at December 31, 2016 are one year or less. There were 34 and 32 available-for-sale securities in an unrealized loss position at December 31, 2016 and 2015, respectively, none of which had been in an unrealized loss position for more than twelve months. The aggregate fair value of these securities at December 31, 2016 and 2015 was approximately $111.3 million and approximately $167.6 million, respectively. The Company reviews its investments for other-than-temporary impairment whenever the fair value of an investment is less than amortized cost and evidence indicates that an investment's carrying amount is not recoverable within a reasonable period of time. To determine whether an impairment is other-than-temporary, the Company considers whether it has the ability and intent to hold the investment until a market price recovery and considers whether evidence indicating the cost of the investment is recoverable outweighs evidence to the contrary. The Company does not intend to sell the investments and it is not more likely than not that the Company will be required to sell the investments before recovery of their amortized cost bases, which may be maturity. The Company did not hold any securities with other-than-temporary impairment at December 31, 2016.

There were no sales of available-for-sale securities during the years ended December 31, 2016, 2015 and 2014. Net unrealized holding gains or losses for the period that have been included in accumulated other comprehensive income were not material to the Company's consolidated results of operations.

8. Inventory

Inventory consisted of the following (in thousands):

	December 31,	
	2016	2015
Raw Materials	$ 1,010	$ —
Work in Progress	71	—
	$ 1,081	$ —

The Company's inventory represents linaclotide API and drug product that is available for commercial sale. The Company evaluates inventory levels quarterly and any inventory that has a cost basis in excess of its expected net realizable value, inventory that becomes obsolete, inventory in excess of expected sales requirements, inventory that fails to meet commercial sale specifications or is otherwise impaired is written down with a corresponding charge to the statement of operations in the period that the impairment is first identified.

The Company has entered into multiple commercial supply agreements for the purchase of linaclotide API. Two of the Company's linaclotide API supply agreements for supplying API to its collaboration partners outside of North America contain minimum purchase commitments (Note 12). Prior to October 2015, the Company was also responsible for the manufacturing of linaclotide API for Europe. As part of the Company's net realizable value assessment of its inventory, the Company assesses whether it has any excess non-cancelable purchase commitments resulting from its minimum supply agreements with its suppliers of linaclotide API.

The determination of the net realizable value of inventory and non-cancelable purchase commitments is based on demand forecasts from the Company's partners, that are received quarterly, to project the next 24 months of demand and the Company's internal forecast for projected demand in subsequent years. During the three months ended June 30, 2015, Almirall, the Company's former European partner, reduced its forecasted purchases of linaclotide API for its territory for the subsequent 18 months. In addition, regulatory changes made by the CFDA to the marketing approval process in China resulted in a potentially lengthened approval timeline for the commercialization of linaclotide. The reduced demand from Almirall and the potential extended timeline for commercialization of linaclotide in China resulted in lower projected sales of linaclotide API to the Company's partners in Europe and China. As a result, during the three months ended June 30, 2015, the Company wrote-down the balance of its inventory of approximately $5.0 million to zero and accrued approximately $3.2 million for excess non-cancelable inventory purchase commitments.

In October 2015, Almirall transferred its exclusive license to develop and commercialize linaclotide in Europe to Allergan, and the Company separately entered into an amendment to the license agreement with Allergan relating to the development and commercialization of linaclotide in Europe. Pursuant to the terms of the amendment, Allergan assumed responsibility for the manufacturing of linaclotide API for Europe, as well as the associated costs (Note 5). Upon the execution of the amendment to the license agreement, the Company recorded an incremental loss on non-cancelable API purchase commitments of approximately $6.9 million related to one of the Company's API supply agreements covering the commercial supply of linaclotide API for the European market. During the three months ended September 30, 2015, the Company also recorded an incremental loss on non-cancelable API purchase commitments related to in-process API batches. As of December 31, 2016, the Company has evaluated all remaining minimum purchase commitments under its linaclotide API supply agreements through 2023 (Note 12) and concluded that the approximately $20.1 million of purchase commitments from the second API supply agreement covering the Japan, China, Hong Kong and Macau markets are realizable based on the current forecasts received from the Company's partners in these territories and the Company's internal forecasts.

During the year ended December 31, 2014, the Company wrote-down approximately $20.3 million in inventory to an estimated net realizable value of approximately $5.0 million. This write-down was primarily attributable to Almirall's reduced inventory demand forecasts for the European territory, mainly due to the suspension of commercialization of CONSTELLA in Germany and a challenging commercial environment throughout Europe.

The write-downs of inventory to net realizable value and the loss on non-cancelable inventory purchase commitments are recorded as a separate line item in the Company's consolidated statement of operations. As of December 31, 2016, the accrual for excess purchase commitments is recorded as approximately $2.5 million in accrued

expenses and other current liabilities and approximately $7.6 million in other liabilities in the Company's consolidated balance sheet.

9. Property and Equipment

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

	December 31,	
	2016	2015
Manufacturing equipment	$ 3,748	$ 3,748
Laboratory equipment	15,021	13,681
Computer and office equipment	2,553	3,596
Furniture and fixtures	2,078	2,062
Software	12,945	12,715
Construction in process	814	375
Leased vehicles	7,058	3,039
Leasehold improvements	38,513	38,465
	82,730	77,681
Less accumulated depreciation and amortization	(62,218)	(56,606)
	$ 20,512	$ 21,075

As of December 31, 2016 and 2015, substantially all of the Company's manufacturing equipment was located in the United Kingdom at one of the Company's contract manufacturers. All other property and equipment were located in the U.S. for the periods presented.

The Company has entered into capital leases for certain computers, vehicles and office equipment (Note 12). As of December 31, 2016 and 2015, the Company had approximately $7.8 million and approximately $3.8 million of assets under capital leases with accumulated amortization balances of approximately $1.6 million and approximately $1.3 million, respectively.

Depreciation and amortization expense of property and equipment, including amounts recorded under capital leases, was approximately $10.3 million, approximately $11.6 million, and approximately $12.3 million for the years ended December 31, 2016, 2015 and 2014, respectively. In addition, the Company wrote-down approximately $0.5 million of leasehold improvement assets not utilized by the Company under the terms of its subleases during the year ended December 31, 2014.

10. Accrued Expenses

Accrued expenses consisted of the following (in thousands):

	December 31,	
	2016	2015
Salaries and benefits	$ 25,884	$ 19,582
Professional fees	1,213	507
Accrued interest	971	1,103
Repurchasable Stock	882	—
Other	9,351	2,109
	$ 38,301	$ 23,301

As of December 31, 2016, other accrued expenses of approximately $9.4 million includes approximately $2.8 million related to expenses incurred under the Lesinurad TSA.

11. Notes Payable

8.375% Notes due 2026

On September 23, 2016, the Company closed a direct private placement, pursuant to which the Company subsequently issued $150.0 million in aggregate principal amount of 8.375% notes due 2026 on the Funding Date, January 5, 2017. The proceeds from the issuance of the 2026 Notes were used to redeem the outstanding principal balance of the PhaRMA Notes on the Funding Date. As of December 31, 2016, the Company capitalized approximately $0.5 million of debt issuance costs, which are included in other assets on the Company's consolidated balance sheet. Upon funding, the issuance costs were netted against the outstanding 2026 Notes.

The 2026 Notes bear an annual interest rate of 8.375%, with interest payable March 15, June 15, September 15 and December 15 of each year (each "8.375% Payment Date") commencing on June 15, 2017. Principal of the 2026 Notes will be payable on the 8.375% Payment Dates beginning March 15, 2019. From March 15, 2019, the Company will make quarterly payments on the 2026 Notes equal to the greater of (i) 7.5% of net sales of linaclotide in the U.S. for the preceding quarter (the "8.375% Synthetic Royalty Amount") and (ii) accrued and unpaid interest on the 2026 Notes (the "8.375% Required Interest Amount"). Principal on the 2026 Notes will be repaid in an amount equal to the 8.375% Synthetic Royalty Amount minus the 8.375% Required Interest Amount, when this is a positive number, until the principal has been paid in full. Given the principal payments on the 2026 Notes are based on the 8.375% Synthetic Royalty Amount, which will vary from quarter to quarter, the 2026 Notes may be repaid prior to September 15, 2026, the final legal maturity date.

The 2026 Notes are secured by a security interest in a segregated bank account established to receive the required quarterly payments as well as certain limited accounts receivables, payment intangibles or other rights to payment or proceeds, in each case, up to the 8.375% Synthetic Royalty Amount or estimated equivalent thereto, as applicable. Up to the amount of the required quarterly payments under the 2026 Notes, Allergan will deposit its quarterly profit (loss) sharing payments due to the Company related to net sales of linaclotide in the U.S. pursuant to the collaboration agreement for North America, if any, into the segregated bank account. If the funds deposited by Allergan into the segregated bank account are insufficient to make a required payment of interest or principal on a particular 8.375% Payment Date, the Company is obligated to deposit such shortfall out of the Company's general funds into the segregated bank account.

The 2026 Notes may be redeemed at any time prior to maturity, in whole or in part, at the option of the Company. If the applicable redemption of the 2026 Notes occurs prior to March 15, 2018, the Company will pay a redemption price equal to the outstanding principal balance of the 2026 Notes being redeemed, plus (i) the difference between (A) the required interest amount that would have otherwise been payable from the date of redemption through March 15, 2018 on the outstanding principal balance of the 2026 Notes being redeemed, minus (B) the aggregate amount of interest the purchasers would earn if the outstanding principal balance of the 2026 Notes being redeemed were reinvested for the period from the date of redemption through March 15, 2018 at a rate per annum equal to the yield expressed as a rate listed in The Wall Street Journal for United States Treasury securities having a term of not greater than 12 months on the date three business days prior to the date of redemption, plus (ii) an amount equal to the redemption premium that would otherwise be payable as if such redemption had occurred at March 15, 2018. If the applicable redemption of the 2026 Notes occurs on or after March 15, 2018, the Company will pay a redemption price equal to the percentage of outstanding principal balance of the 2026 Notes being redeemed specified below for the period in which the redemption occurs (plus the accrued and unpaid interest to the redemption date on the 2026 Notes being redeemed):

Payment Dates	Redemption Percentage
From and including March 15, 2018 to and including March 14, 2019	108.00 %
From and including March 15, 2019 to and including March 14, 2020	105.50 %
From and including March 15, 2020 to and including March 14, 2021	102.75 %
From and including March 15, 2021 and thereafter	100.00 %

The 2026 Notes contain certain covenants related to the Company's obligations with respect to the commercialization of linaclotide and the related collaboration agreement with Allergan for North America, as well as certain customary covenants, including covenants that limit or restrict the Company's ability to incur certain liens, merge or consolidate or make dispositions of assets. The 2026 Notes also specify a number of events of default (some of which

are subject to applicable cure periods), including, among other things, covenant defaults, other non-payment defaults, and bankruptcy and insolvency defaults. Upon the occurrence of an event of default, subject to cure periods in certain circumstances, all amounts outstanding may become immediately due and payable.

The accounting for the 2026 Notes will require the Company to make certain estimates and assumptions about the future net sales of linaclotide in the U.S. Linaclotide has been marketed as LINZESS in the U.S. since December 2012 and the estimates of the magnitude and timing of linaclotide net sales are subject to significant variability and uncertainty. These estimates and assumptions are likely to change, which may result in future adjustments to the portion of the 2026 Notes that will be classified as a current liability, the amortization of debt issuance costs and discounts as well as the accretion of the interest expense. Any such adjustments could be material to the Company's consolidated financial statements.

2.25% Convertible Senior Notes due 2022

In June 2015, the Company issued approximately $335.7 million aggregate principal amount of the 2022 Notes. The Company received net proceeds of approximately $324.0 million from the sale of the 2022 Notes, after deducting fees and expenses of approximately $11.7 million. The Company used approximately $21.1 million of the net proceeds from the sale of the 2022 Notes to pay the net cost of the Convertible Note Hedges (after such cost was partially offset by the proceeds to the Company from the sale of the Note Hedge Warrants), as described below.

The 2022 Notes are governed by an indenture (the "Indenture") between the Company and U.S. Bank National Association, as the trustee. The 2022 Notes are senior unsecured obligations and bear cash interest at the annual rate of 2.25%, payable on June 15 and December 15 of each year, which began on December 15, 2015. The 2022 Notes will mature on June 15, 2022, unless earlier converted or repurchased. The Company may settle conversions of the 2022 Notes through payment or delivery, as the case may be, of cash, shares of Class A common stock of the Company or a combination of cash and shares of Class A common stock, at the Company's option (subject to, and in accordance with, the settlement provisions of the Indenture). The initial conversion rate for the 2022 Notes is 60.3209 shares of Class A common stock (subject to adjustment as provided for in the Indenture) per $1,000 principal amount of the 2022 Notes, which is equal to an initial conversion price of approximately $16.58 per share and 20,249,665 shares. Holders of the 2022 Notes may convert their 2022 Notes at their option at any time prior to the close of business on the business day immediately preceding December 15, 2021 in multiples of $1,000 principal amount, only under the following circumstances:

- during any calendar quarter commencing after the calendar quarter ending on September 30, 2015 (and only during such calendar quarter), if the last reported sale price of the Company's Class A common stock for at least 20 trading days (whether or not consecutive) during a period of 30 consecutive trading days ending on the last trading day of the immediately preceding calendar quarter is greater than or equal to 130% of the conversion price for the 2022 Notes on each applicable trading day;

- during the five business day period after any five consecutive trading day period (the "measurement period") in which the "trading price" (as defined in the Indenture) per $1,000 principal amount of the 2022 Notes for each trading day of the measurement period was less than 98% of the product of the last reported sale price of the Company's Class A common stock and the conversion rate for the 2022 Notes on each such trading day; or

- upon the occurrence of specified corporate events described in the Indenture.

On or after December 15, 2021, until the close of business on the second scheduled trading day immediately preceding June 15, 2022, holders may convert their 2022 Notes, in multiples of $1,000 principal amount, at the option of the holder regardless of the foregoing circumstances.

If a make-whole fundamental change, as described in the Indenture, occurs and a holder elects to convert its 2022 Notes in connection with such make-whole fundamental change, such holder may be entitled to an increase in the conversion rate as described in the Indenture. The Company may not redeem the 2022 Notes prior to the maturity date and no "sinking fund" is provided for by the 2022 Notes, which means that the Company is not required to periodically redeem or retire the 2022 Notes. Upon the occurrence of certain fundamental changes involving the Company, holders of

the 2022 Notes may require the Company to repurchase for cash all or part of their 2022 Notes at a repurchase price equal to 100% of the principal amount of the 2022 Notes to be repurchased, plus accrued and unpaid interest.

The Indenture does not contain any financial covenants or restrict the Company's ability to repurchase the Company's securities, pay dividends or make restricted payments in the event of a transaction that substantially increases the Company's level of indebtedness. The Indenture provides for customary events of default. In the case of an event of default with respect to the 2022 Notes arising from specified events of bankruptcy or insolvency, all outstanding 2022 Notes will become due and payable immediately without further action or notice. If any other event of default with respect to the 2022 Notes under the Indenture occurs or is continuing, the trustee or holders of at least 25% in aggregate principal amount of the then outstanding 2022 Notes may declare the principal amount of the 2022 Notes to be immediately due and payable. Notwithstanding the foregoing, the Indenture provides that, upon the Company's election, and for up to 180 days, the sole remedy for an event of default relating to certain failures by the Company to comply with certain reporting covenants in the Indenture consists exclusively of the right to receive additional interest on the 2022 Notes.

In accordance with accounting guidance for debt with conversion and other options, the Company separately accounted for the liability and equity components of the 2022 Notes by allocating the proceeds between the liability component and the embedded conversion option, or equity component, due to the Company's ability to settle the 2022 Notes in cash, its Class A common stock, or a combination of cash and Class A common stock at the option of the Company. The carrying amount of the liability component was calculated by measuring the fair value of a similar liability that does not have an associated convertible feature. The allocation was performed in a manner that reflected the Company's non-convertible debt borrowing rate for similar debt. The equity component of the 2022 Notes was recognized as a debt discount and represents the difference between the gross proceeds from the issuance of the 2022 Notes and the fair value of the liability of the 2022 Notes on their respective dates of issuance. The excess of the principal amount of the liability component over its carrying amount, or debt discount, is amortized to interest expense using the effective interest method over seven years, or the life of the 2022 Notes. The equity component is not remeasured as long as it continues to meet the conditions for equity classification.

The Company's outstanding Convertible Note balances as of December 31, 2016 and 2015 consisted of the following (in thousands):

	December 31,	
Liability component:	2016	2015
Principal	$ 335,699	$ 335,699
Less: unamortized debt discount	(94,675)	(107,636)
Less: unamortized debt issuance costs	(6,781)	(7,443)
Net carrying amount	$ 234,243	$ 220,620
Equity component	$ 114,199	$ 114,199

In connection with the issuance of the 2022 Notes, the Company incurred approximately $11.7 million of debt issuance costs, which primarily consisted of initial purchasers' discounts and legal and other professional fees. The Company allocated these costs to the liability and equity components based on the allocation of the proceeds. The portion of these costs allocated to the equity components totaling approximately $4.0 million were recorded as a reduction to additional paid-in capital. The portion of these costs allocated to the liability components totaling approximately $7.7 million were recorded as a reduction in the carrying value of the debt on the balance sheet and are amortized to interest expense using the effective interest method over the expected life of the 2022 Notes.

The Company determined the expected life of the 2022 Notes was equal to their seven-year term. The effective interest rate on the liability components of the 2022 Notes for the period from the date of issuance through December 31,

2016 was 9.34%. The following table sets forth total interest expense recognized related to the 2022 Notes during the years ended December 31, 2016 and 2015 (in thousands):

	Year Ended December 31,	
	2016	2015
Contractual interest expense	$ 7,553	$ 4,069
Amortization of debt issuance costs	661	305
Amortization of debt discount	12,961	6,563
Total interest expense	$ 21,175	$ 10,937

Future minimum payments under the 2022 Notes as of December 31, 2016, are as follows (in thousands):

2017	$ 7,553
2018	7,553
2019	7,553
2020	7,553
2021	7,553
Thereafter	339,477
Total future minimum payments under the 2022 Notes	377,242
Less: amounts representing interest	(41,543)
Less: unamortized debt discount	(94,675)
Less: unamortized debt issuance costs	(6,781)
Convertible senior notes balance	$ 234,243

Convertible Note Hedge and Warrant Transactions with Respect to 2022 Notes

To minimize the impact of potential dilution to the Company's Class A common stockholders upon conversion of the 2022 Notes, the Company entered into the Convertible Note Hedges covering 20,249,665 shares of the Company's Class A common stock in connection with the issuance of the 2022 Notes. The Convertible Note Hedges have an exercise price of approximately $16.58 per share and are exercisable when and if the 2022 Notes are converted. If upon conversion of the 2022 Notes, the price of the Company's Class A common stock is above the exercise price of the Convertible Note Hedges, the counterparties are obligated to deliver shares of the Company's Class A common stock and/or cash with an aggregate value approximately equal to the difference between the price of the Company's Class A common stock at the conversion date and the exercise price, multiplied by the number of shares of the Company's Class A common stock related to the Convertible Note Hedge being exercised.

Concurrently with entering into the Convertible Note Hedges, the Company also sold Note Hedge Warrants to the Convertible Note Hedge counterparties to acquire 20,249,665 shares of the Company's Class A common stock, subject to customary anti-dilution adjustments. The strike price of the Note Hedge Warrants is initially $21.50 per share, subject to adjustment, and such warrants are exercisable over the 150 trading day period beginning on September 15, 2022. The Note Hedge Warrants could have a dilutive effect on the Class A common stock to the extent that the market price per share of the Company's Class A common stock exceeds the applicable strike price of such warrants.

The Convertible Note Hedges and the Note Hedge Warrants are separate transactions entered into by the Company and are not part of the terms of the 2022 Notes. Holders of the 2022 Notes and the Note Hedge Warrants do not have any rights with respect to the Convertible Note Hedges. The Company paid approximately $91.9 million for the Convertible Note Hedges and recorded this amount as a long-term asset on the consolidated balance sheet. The Company received approximately $70.8 million for the Note Hedge Warrants and recorded this amount as a long-term liability, resulting in a net cost to the Company of approximately $21.1 million. The Convertible Note Hedges and Note Hedge Warrants are accounted for as derivative assets and liabilities, respectively, in accordance with ASC 815 (Note 6).

11% PhaRMA Notes due 2024

In January 2013, the Company closed a private placement of $175.0 million in aggregate principal amount of notes due on or before June 15, 2024. The PhaRMA Notes were redeemed on the 2026 Notes' Funding Date, January 5, 2017. The redemption is more fully described in Note 20, *Subsequent Events.* The PhaRMA Notes bore an annual

interest rate of 11%, with interest payable March 15, June 15, September 15 and December 15 of each year (each "11% Payment Date") which began on June 15, 2013. On March 15, 2014, the Company began making quarterly payments on the PhaRMA Notes equal to the greater of (i) 7.5% of net sales of LINZESS in the U.S. for the preceding quarter (the "11% Synthetic Royalty Amount") and (ii) accrued and unpaid interest on the PhaRMA Notes (the "11% Required Interest Amount"). Principal on the PhaRMA Notes was repaid in an amount equal to the 11% Synthetic Royalty Amount minus the 11% Required Interest Amount, when this was a positive number, until the notes were fully redeemed. The Company made principal payments of approximately $40.7 million through December 31, 2016.

As of December 31, 2016, the PhaRMA Notes were secured solely by a security interest in a segregated bank account established to receive the required quarterly payments. Up to the amount of the required quarterly payments under the PhaRMA Notes, Allergan deposited its quarterly profit (loss) sharing payments due to the Company under the collaboration agreement for North America, if any, into the segregated bank account. If the funds deposited by Allergan into the segregated bank account were insufficient to make a required payment of interest or principal on a particular 11% Payment Date, the Company was obligated to deposit such shortfall out of the Company's general funds into the segregated bank account.

The PhaRMA Notes could be redeemed at any time prior to maturity, in whole or in part, at the option of the Company. The Company was required to pay a redemption price equal to the percentage of outstanding principal balance of the PhaRMA Notes being redeemed specified below for the period in which the redemption was to occur (plus the accrued and unpaid interest to the redemption date on the PhaRMA Notes being redeemed):

Payment Dates	Redemption Percentage
From and including January 1, 2016 to and including December 31, 2016	102.75 %
From and including January 1, 2017 and thereafter	100.00 %

The PhaRMA Notes contained certain covenants related to the Company's obligations with respect to the commercialization of LINZESS and the related collaboration agreement with Allergan for North America, as well as certain customary covenants, including covenants that limited or restricted the Company's ability to incur certain liens, merge or consolidate or make dispositions of assets. The PhaRMA Notes also specified a number of events of default (some of which are subject to applicable cure periods), including, among other things, covenant defaults, other non-payment defaults, and bankruptcy and insolvency defaults.

The up-front cash proceeds of $175.0 million, less a discount of approximately $0.4 million for payment of legal fees incurred on behalf of the noteholders, were recorded as notes payable at issuance. The Company also capitalized approximately $7.3 million of debt issuance costs in connection with the PhaRMA Notes. The PhaRMA Notes issuance costs and discount were amortized over the estimated term of the obligation using the effective interest method. The repayment provisions represent embedded derivatives that are clearly and closely related to the PhaRMA Notes and as such did not require separate accounting treatment.

The accounting for the PhaRMA Notes required the Company to make certain estimates and assumptions about the future net sales of LINZESS in the U.S. prior to December 31, 2016. As of December 31, 2016, the Company did not make estimates and assumptions about the future net sales of LINZESS in the U.S. to record the classification of the PhaRMA Notes on the consolidated balance sheets. In accordance with ASC Topic 470, *Debt*, the Company recorded the outstanding PhaRMA Notes balance as a long-term obligation, as the balance was subsequently redeemed on the Funding Date, January 5, 2017, with proceeds from the 2026 Notes. Principal of the 2026 Notes will be payable on the 8.375% Payment Dates beginning March 15, 2019.

12. Commitments and Contingencies

Lease Commitments

The Company leases its facility, offsite data storage location, vehicles and various equipment under leases that expire at varying dates through 2018. Certain of these leases contain renewal options, and require the Company to pay operating costs, including property taxes, insurance, maintenance and other operating expenses.

As of December 31, 2016, the Company rents office and laboratory space at its corporate headquarters in Cambridge, Massachusetts under a non-cancelable operating lease, entered into in January 2007, as amended ("2007 Lease Agreement"). The 2007 Lease Agreement contains various provisions for renewal at the Company's option and, in certain cases, free rent periods and rent escalation tied to the Consumer Price Index and fair market rent. The rent expense, inclusive of the escalating rent payments and free rent periods, is recognized on a straight-line basis over the lease term through January 2018. The Company maintains a letter of credit securing its obligations under the lease agreement of approximately $7.6 million, which is recorded as restricted cash. In addition to rents due under this lease, the Company is obligated to pay facilities charges, including utilities and taxes. In connection with the 2007 Lease Agreement, the Company was provided allowances totaling approximately $22.9 million as reimbursement for financing capital improvements to the facility. The reimbursement amount is recorded as deferred rent on the consolidated balance sheets and is being amortized as a reduction to rent expense over the lease term, as applicable.

In 2014, the Company entered into arrangements, with the landlord's consent, to sublease a portion of its Cambridge, Massachusetts corporate headquarters as it did not intend to use the space for its operations. Under the first sublease, the Company's operating lease obligations through 2018 are partially offset by future sublease payments to it of approximately $16.1 million (of which approximately $9.9 million has been received through December 31, 2016) and under the second sublease, the Company's operating lease obligations through 2016 were partially offset by sublease payments to it of approximately $1.9 million received through December 31, 2016. During the year ended December 31, 2014, the Company recorded aggregate charges of approximately $2.6 million, which represent its obligations to the landlord associated with the sublet space, net of sublease income due to the Company under the subleases, and a partial write-down of leasehold improvement assets not utilized by the Company under the terms of the subleases.

Effective in February 2016, the Company's obligations due to the landlord of its corporate headquarters increased in connection with a rent escalation tied to the Consumer Price Index and fair market rent, pursuant to the terms of the 2007 Lease Agreement, which resulted in a change in the accounting estimate of rent expense. This change in accounting estimate is recognized on a prospective, straight-line basis. Rent expenses related to the 2007 Lease Agreement, net of sublease income, recorded during the years ended December 31, 2016, 2015 and 2014 were approximately $11.6 million, approximately $6.3 million and approximately $10.2 million, respectively. Sublease income was approximately $5.2 million, approximately $5.3 million and approximately $2.6 million under the operating leases for the years ended December 31, 2016, 2015 and 2014, respectively. In accordance with ASC Topic 420, *Exit or Disposal Cost Obligations*, the Company recorded all obligations to the landlord associated with sublet space, net of sublease income due to the Company under the subleases in the period in which the change occurred. As a result, the rent expense associated with the 2007 Lease Agreement for the year ended December 31, 2016 includes charges of approximately $3.5 million of estimated obligations to the landlord associated with the sublet space, net of sublease income due to the Company under the subleases.

In 2013, the Company entered into 36-month capital leases (the "2013 Vehicle Leases") for the vehicle fleet for its field-based sales force and medical science liaisons. The 2013 Vehicle Leases expired at various times through September 2016.

In November 2015, the Company entered into 12-month capital leases (the "2015 Vehicle Leases") for certain vehicles within its vehicle fleet for its field-based sales force and medical science liaisons. The 2015 Vehicle Leases expire at varying times through December 2017. In accordance with the terms of the 2015 Vehicle Leases, the Company maintains a letter of credit securing its obligations under the lease agreements of $0.6 million, which is recorded as restricted cash. In connection with entering into the 2015 Vehicle Leases, all of the 2013 Vehicle Leases were terminated as of December 31, 2016. At December 31, 2016, the weighted average interest rate on the outstanding 2015 Vehicle Lease obligations was approximately 3.3%.

The Company has also entered into capital leases for certain computer and office equipment. These capital leases expire in April 2018. At December 31, 2016, the weighted average interest rate on the outstanding capital lease obligations was approximately 14.5%.

At December 31, 2016, future minimum lease payments under all non-cancelable lease arrangements were as follows (in thousands):

	Operating Lease Payments	Lease Payments to be Received from Subleases	Net Operating Lease Payments	Capital Lease Payments
2017	20,498	$ (5,649)	$ 14,849	$ 6,370
2018	831	$ (475)	$ 356	$ 85
Total future minimum lease payments	$21,329	$ (6,124)	$ 15,205	$ 6,455
Less: amounts representing interest				(146)
Capital lease obligations at December 31, 2016				6,309
Less: current portion of capital lease obligations				(6,227)
Capital lease obligations, net of current portion				$ 82

Commercial Supply Commitments

The Company has entered into multiple commercial supply agreements for the purchase of linaclotide finished drug product and API. Two of the Company's API supply agreements for supplying API to its collaboration partners outside of North America contain minimum purchase commitments. In July 2015 and August 2015, the Company entered into amendments to its agreements with two of its suppliers of linaclotide API. One amendment reduced the Company's non-cancelable purchase commitments and the other increased the Company's non-cancelable purchase commitments, but extended the timeframe over which the Company must purchase the API. The amended contracts include remaining total non-cancelable commercial supply purchase obligations of approximately $30.2 million through 2023.

During the year ended December 31, 2015, the Company recognized approximately $10.1 million as an accrual for excess purchases commitments (Note 8). The first payment of approximately $2.5 million related to these accrued excess purchase commitments is in 2017, and is reflected as an other current liability in the Company's consolidated balance sheet. The remaining payments under these accrued excess purchase commitments begin in 2018, and are approximately $2.5 million in each of the years 2018, 2019 and 2020. Such payments are recorded as other liabilities in the Company's consolidated balance sheet. As of December 31, 2016, the Company's unrecognized minimum purchase requirements and other firm commitments related to the supply contracts associated with the territories not covered by the partnerships with Allergan for North America were as follows (in thousands):

2017	$ 2,259
2018	2,322
2019	3,096
2020	3,096
2021	3,096
Thereafter	6,192
Total unrecognized minimum purchase requirements	$ 20,061

In addition, the Company and Allergan are jointly obligated to make minimum purchases of linaclotide API for the territories covered by the Company's collaboration with Allergan for North America. Currently, Allergan fulfills all such minimum purchase commitments and, as a result, they are excluded from the amounts above. As of December 31, 2016, the Company has evaluated all remaining minimum purchase commitments under its linaclotide API supply agreements and has concluded that the remaining purchase commitments are realizable based on the current forecasts received from certain of the Company's partners and the Company's internal forecasts.

The Lesinurad CSA with AstraZeneca provides for commercial supply and samples of ZURAMPIC, and, if approved by the FDA, DUZALLO. The Lesinurad CSA includes certain purchase obligations based on the Company's forecasted demand for commercial product and samples. As of December 31, 2016, the Company had approximately $6.6 million of such commitments related to lesinurad commercial supply and samples for 2017 and none thereafter. During the TSA period, the Company records purchases of ZURAMPIC commercial supply and samples in prepaid assets as title does not pass to the Company. During the year ended December 31, 2016, the Company wrote-down approximately $0.4 million of prepaid ZURAMPIC commercial supply as result of revised demand forecasts. This

write-down was recorded in write-downs of inventory to net realizable value and the loss on non-cancelable inventory purchase commitments in the Company's consolidated statement of operations.

As of December 31, 2016, the Company has evaluated all remaining non-cancelable purchase commitments under the Lesinurad CSA and concluded that its non-cancelable purchase commitments are realizable based on the Company's forecasted demand.

Commitments Related to the Collaboration and License Agreements

Under the collaborative agreements with Allergan for North America and AstraZeneca for China, Hong Kong and Macau, respectively, the Company shares with Allergan and AstraZeneca all development and commercialization costs related to linaclotide in the U.S. and for China, Hong Kong and Macau, respectively. The actual amounts that the Company pays its partners or that partners pay to the Company will depend on numerous factors outside of the Company's control, including the success of certain clinical development efforts with respect to linaclotide, the content and timing of decisions made by the regulators, the reimbursement and competitive landscape around linaclotide and the Company's other product candidates, and other factors.

Under the Lesinurad License, the Company is undertaking the development and commercialization of lesinurad in the U.S. Pursuant to the terms of the Lesinurad License, the Company will pay a tiered royalty to AstraZeneca in the single-digits as a percentage of net sales of ZURAMPIC, and if approved DUZALLO, in the U.S., as well as commercial and other milestones of up to $165.0 million over the duration of the agreement. Additionally, AstraZeneca is obligated to conduct certain development activities on the Company's behalf for (i) ZURAMPIC, including the post-marketing requirement activities currently required by the FDA, for which the Company is obligated to reimburse AstraZeneca up to $100.0 million over up to ten years, and (ii) DUZALLO, for which the Company will also reimburse AstraZeneca.

In addition, the Company has commitments to make potential future milestone payments to third parties under certain of its license and collaboration arrangements. These milestones primarily include the commencement and results of clinical trials, obtaining regulatory approval in various jurisdictions and the future commercial success of development programs, the outcome and timing of which are difficult to predict and subject to significant uncertainty. In addition to the milestones discussed above, the Company is obligated to pay royalties on future sales, which are contingent on generating levels of sales of future products that have not been achieved and may never be achieved.

These agreements are more fully described in Note 4, *Business Combinations* and Note 5, *Collaboration, License, Co-promotion and Other Commercial Agreements*, to these consolidated financial statements.

Other Funding Commitments

As of December 31, 2016, the Company has several on-going studies in various clinical trial stages. The Company's most significant clinical trial expenditures are to contract research organizations ("CRO"). The contracts with CROs generally are cancellable, with notice, at the Company's option and do not have any significant cancellation penalties.

Guarantees

As permitted under Delaware law, the Company indemnifies its officers and directors for certain events or occurrences while the officer or director is, or was, serving at the Company's request in such capacity. The maximum potential amount of future payments the Company could be required to make is unlimited; however, the Company has directors' and officers' insurance coverage that is intended to limit its exposure and enable it to recover a portion of any future amounts paid.

The Company enters into certain agreements with other parties in the ordinary course of business that contain indemnification provisions. These typically include agreements with directors and officers, business partners, contractors, landlords, clinical sites and customers. Under these provisions, the Company generally indemnifies and holds harmless the indemnified party for losses suffered or incurred by the indemnified party as a result of the Company's activities. These indemnification provisions generally survive termination of the underlying agreements. The maximum potential amount of future payments the Company could be required to make under these indemnification provisions is unlimited. However, to date the Company has not incurred material costs to defend lawsuits or settle claims

related to these indemnification provisions. As a result, the estimated fair value of these obligations is minimal. Accordingly, the Company had no liabilities recorded for these obligations as of December 31, 2016 and 2015.

Litigation

From time to time, the Company is involved in various legal proceedings and claims, either asserted or unasserted, which arise in the ordinary course of business. While the outcome of these other claims cannot be predicted with certainty, management does not believe that the outcome of any of these ongoing legal matters, individually and in aggregate, will have a material adverse effect on the Company's consolidated financial statements.

In 2016, the Company and Allergan received Paragraph IV certification notice letters ("Notice Letters") regarding abbreviated new drug applications ("ANDAs") submitted to the FDA by generic drug manufacturers requesting approval to engage in commercial manufacture, use, sale and offer for sale of linaclotide capsules (145 mcg and 290 mcg), proposed generic versions of our FDA-approved drug LINZESS. In response to the four ANDAs received in 2016, the Company and Allergan filed a lawsuit against these generic drug manufacturers in Delaware District Court in November 2016. In accordance with the Hatch-Waxman Act, the timely filing of the lawsuit against the generic drug manufacturers triggered an automatic stay of the FDA's approval of the four ANDAs until February 29, 2020, unless there is a final court decision sooner and absent any adjustments by the court adverse to the Company and Allergan. The Company is unable to estimate the outcome of this lawsuit at this time.

13. Stockholders' Equity

Preferred Stock

The Company's preferred stock may be issued from time to time in one or more series, with each such series to consist of such number of shares and to have such terms as adopted by the board of directors. Authority is given to the board of directors to determine and fix such voting powers, full or limited, or no voting powers, and such designations, preferences and relative participating, optional or other special rights, and qualifications, limitation or restrictions thereof, including without limitation, dividend rights, conversion rights, redemption privileges and liquidation preferences.

Common Stock

The Company has designated two series of common stock, Series A common stock ("Class A Common Stock") and Series B common stock ("Class B Common Stock"). All shares of common stock that were outstanding immediately prior to August 2008 were converted into shares of Class B Common Stock. The holders of Class A Common Stock and Class B Common Stock vote together as a single class. Class A Common Stock is entitled to one vote per share. Class B Common Stock is also entitled to one vote per share with the following exceptions: (1) after the completion of an initial public offering ("IPO") of the Company's stock, the holders of the Class B Common Stock are entitled to ten votes per share if the matter is an adoption of an agreement of merger or consolidation, an adoption of a resolution with respect to the sale, lease, or exchange of the Company's assets or an adoption of dissolution or liquidation of the Company, and (2) Class B common stockholders are entitled to ten votes per share on any matter if any individual, entity, or group seeks to obtain or has obtained beneficial ownership of 30% or more of the Company's outstanding shares of common stock. Class B Common Stock can be sold at any time and irrevocably converts to Class A Common Stock, on a one-for-one basis, upon sale or transfer. The Class B Common Stock is also entitled to a separate class vote for the issuance of additional shares of Class B Common Stock (except pursuant to dividends, splits or convertible securities), or any amendment, alteration or repeal of any provision of the Company's charter. All Class B Common Stock will automatically convert into Class A Common Stock upon the earliest of:

- the later of (1) the first date on which the number of shares of Class B Common Stock then outstanding is less than 19,561,556 which represents 25% of the number of shares of Class B Common Stock outstanding immediately following the completion of the Company's IPO or (2) December 31, 2018;
- December 31, 2038; or
- a date agreed to in writing by a majority of the holders of the Class B Common Stock.

The Company has reserved such number of shares of Class A Common Stock as there are outstanding shares of Class B Common Stock solely for the purpose of effecting the conversion of the Class B Common Stock.

The holders of shares of Class A Common Stock and Class B Common Stock are entitled to dividends if and when declared by the board of directors. In the event that dividends are paid in the form of common stock or rights to acquire common stock, the holders of shares of Class A Common Stock shall receive Class A Common Stock or rights to acquire Class A Common Stock and the holders of shares of Class B Common Stock shall receive Class B Common Stock or rights to acquire Class B Common Stock, as applicable.

In the event of a voluntary or involuntary liquidation, dissolution, distribution of assets, or winding up of the Company, the holders of shares of Class A Common Stock and the holders of shares of Class B Common Stock are entitled to share equally, on a per share basis, in all assets of the Company of whatever kind available for distribution to the holders of common stock.

The Company has reserved, out of its authorized but unissued shares of Class A Common Stock, sufficient shares to affect the conversion of the 2022 Notes and the Note Hedge Warrants, pursuant to the terms thereof (Note 11).

In the first quarter of 2014, the Company sold 15,784,325 shares of its Class A Common Stock through a firm commitment, underwritten public offering at a price to the public of $12.75 per share. As a result of this offering, the Company received aggregate net proceeds, after underwriting discounts and commissions and other offering expenses, of approximately $190.4 million.

14. Stock Benefit Plans

The following table summarizes the expense recognized for share-based compensation arrangements in the consolidated statements of operations (in thousands):

	Year Ended December 31,		
	2016	2015	2014
Employee stock options	$ 21,412	$ 20,668	$ 19,373
Restricted stock units	4,023	1,536	—
Restricted stock awards	2,325	2,408	2,671
Non-employee stock options	529	—	2,618
Employee stock purchase plan	910	833	941
Workforce reduction	—	—	551
Stock award	20	24	30
	$ 29,219	$ 25,469	$ 26,184

Share-based compensation is reflected in the consolidated statements of operations as follows for the years ended December 31, 2016, 2015 and 2014 (in thousands):

	Years Ended December 31,		
	2016	2015	2014
Research and development	$11,344	$10,065	$ 9,482
Selling, general and administrative	17,875	15,404	16,702
	$29,219	$25,469	$26,184

On November 4, 2014, the Company agreed to accelerate the vesting of a former executive officer's outstanding unvested stock options on the executive officer's departure date of December 31, 2014, and to allow the exercise of vested stock options for up to two years subsequent to the departure date, or until their expiration, whichever is earlier. These equity modifications resulted in an incremental charge of approximately $2.3 million, which was recorded within selling, general and administrative expenses during the year ended December 31, 2014.

Stock Benefit Plans

The Company has two share-based compensation plans pursuant to which awards are currently being made: the Amended and Restated 2010 Employee, Director and Consultant Equity Incentive Plan ("2010 Equity Plan") and the

Amended and Restated 2010 Employee Stock Purchase Plan ("2010 Purchase Plan"). The Company also has two share-based compensation plans under which there are outstanding awards, but from which no further awards will be made: the Amended and Restated 2005 Stock Incentive Plan ("2005 Equity Plan") and the Amended and Restated 2002 Stock Incentive Plan ("2002 Equity Plan"). At December 31, 2016, there were 15,751,858 shares available for future grant under all such plans.

2010 Equity Plan

During 2010, the Company's stockholders approved the 2010 Equity Plan under which stock options, restricted stock awards, RSUs, and other stock-based awards may be granted to employees, officers, directors, or consultants of the Company. There were 6,000,000 shares of common stock initially reserved for issuance under the 2010 Equity Plan. The number of shares available for future grant may be increased on the first day of each fiscal year by an amount equal to the lesser of: (i) 6,600,000; (ii) 4% of the number of outstanding shares of common stock on the first day of each fiscal year; and (iii) an amount determined by the board of directors. Awards that are returned to the Company's other equity plans as a result of their expiration, cancellation, termination or repurchase are automatically made available for issuance under the 2010 Equity Plan. At December 31, 2016, there were 12,959,613 shares available for future grant under the 2010 Equity Plan.

2010 Purchase Plan

During 2010, the Company's stockholders approved the 2010 Purchase Plan, which gives eligible employees the right to purchase shares of common stock at the lower of 85% of the fair market value on the first or last day of an offering period. Each offering period is six months. There were 400,000 shares of common stock initially reserved for issuance pursuant to the 2010 Purchase Plan. The number of shares available for future grant under the 2010 Purchase Plan may be increased on the first day of each fiscal year by an amount equal to the lesser of: (i) 1,000,000 shares, (ii) 1% of the Class A shares of common stock outstanding on the last day of the immediately preceding fiscal year, or (iii) such lesser number of shares as is determined by the board of directors. At December 31, 2016, there were 2,792,245 shares available for future grant under the 2010 Purchase Plan.

2005 Equity Plan and 2002 Equity Plan

The 2005 Equity Plan and 2002 Equity Plan provided for the granting of stock options, restricted stock awards, RSUs, and other share-based awards to employees, officers, directors, consultants, or advisors of the Company. At December 31, 2016, there were no shares available for future grant under the 2005 Equity Plan or the 2002 Equity Plan.

Restricted Stock Awards

In 2016, the Company granted an aggregate of 191,977 shares of Class A Common Stock to independent members of the board of directors under restricted stock agreements in accordance with the terms of the 2010 Equity Plan and the Company's director compensation plan, effective in January 2014. These shares of restricted stock vest ratably over the period of service from the Company's 2016 annual meeting of stockholders through the Company's 2017 annual meeting of stockholders, provided the individual continues to serve on the Company's board of directors through each vest date.

In 2015, the Company granted an aggregate of 151,604 shares of Class A Common Stock to independent members of the board of directors under restricted stock agreements in accordance with the terms of the 2010 Equity Plan and the Company's director compensation plan, effective in January 2014. These shares of restricted stock vested ratably over the period of service from the Company's 2015 annual meeting of stockholders through the Company's 2016 annual meeting of stockholders, provided the individual continued to serve on the Company's board of directors through each vest date. The fair value of all RSAs is based on the market value of the Company's Class A Common Stock on the date of grant. Compensation expense, including the effect of estimated forfeitures, is recognized over the applicable service period.

A summary of the unvested shares of restricted stock as of December 31, 2016 is presented below:

	Number of Shares	Weighted-Average Grant Date Fair Value
Unvested as of December 31, 2015	74,502	$ 14.14
Granted	191,977	$ 12.68
Vested	(171,783)	$ 13.30
Forfeited	—	$ —
Unvested as of December 31, 2016	94,696	$ 12.69

Restricted Stock Units

In 2015, the Company began utilizing RSUs, in addition to stock options as part of the equity compensation it provides to its employees, each RSU representing the right to receive one share of the Company's Class A Common Stock pursuant to the terms of the applicable award agreement and granted pursuant to the terms of the Company's 2010 Equity Plan. The RSUs generally vest 25% per year on the approximate anniversary of the date of grant until fully vested, provided the employee remains continuously employed with the Company through each vesting date. Shares of the Company's Class A Common Stock are delivered to the employee upon vesting, subject to payment of applicable withholding taxes. The fair value of all RSUs is based on the market value of the Company's Class A Common Stock on the date of grant. Compensation expense, including the effect of estimated forfeitures, is recognized over the applicable service period.

A summary of RSU activity for the year ended December 31, 2016 is as follows:

	Number of Shares	Weighted-Average Grant Date Fair Value
Unvested as of December 31, 2015	900,051	$ 13.36
Granted	716,357	$ 11.74
Vested	(230,065)	$ 13.34
Forfeited	(86,886)	$ 12.42
Unvested as of December 31, 2016	1,299,457	$ 12.53

Stock Options

Stock options granted under the Company's equity plans generally have a ten-year term and vest over a period of four years, provided the individual continues to serve at the Company through the vesting dates. Options granted under all equity plans are exercisable at a price per share not less than the fair market value of the underlying common stock on the date of grant. The estimated fair value of options, including the effect of estimated forfeitures, is recognized over the requisite service period, which is typically the vesting period of each option.

The weighted average assumptions used to estimate the fair value of the stock options using the Black-Scholes option-pricing model were as follows for the years ended December 31, 2016, 2015 and 2014:

	Year Ended December 31,		
	2016	2015	2014
Expected volatility	45.9 %	46.1 %	46.8 %
Expected term (in years)	6.06	6.04	6.10
Risk-free interest rate	1.5 %	1.7 %	1.8 %
Expected dividend yield	— %	— %	— %

Expected volatility is based on the historic volatility of the Company's Class A common stock. The Company estimates the expected term using historical data. The risk-free interest rate used for each grant is based on a zero-coupon U.S. Treasury instrument with a remaining term similar to the expected term of the share-based award. The

Company has not paid and does not anticipate paying cash dividends on its shares of common stock in the foreseeable future; therefore, the expected dividend yield is assumed to be zero.

The weighted-average grant date fair value per share of options granted during the years ended December 31, 2016, 2015 and 2014 was $5.08, $6.73 and $6.47, respectively.

The Company's Class B Common Stock is issuable upon exercise of options granted prior to the closing of the Company's IPO under the 2002 Equity Plan and the 2005 Equity Plan, and its Class A Common Stock is issuable upon exercise of all options granted after the closing of the Company's IPO under the Company's equity plans. At December 31, 2016, options exercisable into 2,318,017 shares of Class B Common Stock and 18,136,642 shares of Class A Common Stock were outstanding.

Subject to approval by the board of directors, option grantees under the 2002 Equity Plan and the 2005 Equity Plan may have the right to exercise an option prior to vesting. The exercise of these shares is not substantive and as a result, the cash paid for the exercise prices is considered a deposit or prepayment of the exercise price and is recorded as a liability. The Company recorded a liability of approximately $0.9 million as of December 31, 2016 for cash received related to the exercise of such options. Amounts received upon the exercise of these shares were not material to the consolidated financial statements as of December 31, 2015.

The Company, from time to time, issues certain time-accelerated stock options to certain employees. The vesting of these options accelerates upon the achievement of certain performance-based milestones. If these criteria are not met, such options will vest between six and ten years after the date of grant. During the year ended December 31, 2016, 100,000 shares vested as a result of milestone or service period achievements. At December 31, 2016 and 2015, there were 300,000 shares and 400,000 shares issuable under unvested time-accelerated options, respectively. When achievement of the milestone is not deemed probable, the Company recognizes compensation expense associated with time-accelerated stock options initially over the vesting period of the respective stock option. When deemed probable of achievement, the Company expenses the remaining unrecognized compensation over the implicit service period. The Company recorded an insignificant amount in share-based compensation related to these time-accelerated options during each of the years ended December 31, 2016 and 2015. The Company recorded approximately $1.2 million in share-based compensation related to these time-accelerated options during the year ended December 31, 2014.

The Company also grants to certain employees performance-based options to purchase shares of common stock. These options are subject to performance-based milestone vesting. During the year ended December 31, 2016, 35,000 shares vested as a result of performance milestone achievements. The Company recorded share-based compensation related to these performance-based options of approximately $1.4 million, approximately $0.2 million and approximately $0.5 million, respectively, during the years ended December 31, 2016, 2015 and 2014.

The following table summarizes stock option activity under the Company's share-based compensation plans, including performance-based options:

	Shares of Common Stock Attributable to Options	Weighted-Average Exercise Price	Weighted-Average Contractual Life	Aggregate Intrinsic Value
			(in years)	(in thousands)
Outstanding at December 31, 2015	20,566,860	$ 11.18	5.90	$ 38,279
Granted	4,484,086	$ 11.22		
Exercised	(3,467,252)	$ 6.36		
Cancelled	(1,129,035)	$ 12.75		
Outstanding at December 31, 2016	20,454,659	$ 11.92	6.35	$ 70,247
Vested or expected to vest at December 31, 2016	19,048,936	$ 11.94	6.23	$ 64,923
Exercisable at December 31, 2016 [1]	13,116,064	$ 11.82	5.38	$ 46,007

(1) All stock options granted under the 2002 Equity Plan and the 2005 Equity Plan contain provisions allowing for the early exercise of such options into restricted stock. The exercisable shares disclosed above represent those that were vested as of December 31, 2016.

The total intrinsic value of options exercised during the years ended December 31, 2016, 2015 and 2014 was approximately $23.9 million, approximately $17.7 million and approximately $26.9 million, respectively. The intrinsic value was calculated as the difference between the fair value of the Company's common stock and the exercise price of the option issued.

The following table sets forth the Company's unrecognized share-based compensation expense, net of estimated forfeitures, as of December 31, 2016, by type of award and the weighted-average period over which that expense is expected to be recognized:

	Unrecognized Expense, Net of Estimated Forfeitures (in thousands)	Weighted-Average Remaining Recognition Period (in years)
Type of award:		
Stock options with time-based vesting	$ 30,066	2.67
Restricted stock awards	1,001	0.42
Restricted stock units	10,300	2.91
Time-accelerated stock options (1)	3	—
Performance-based options (1)	1,670	—

(1) The weighted-average remaining recognition period cannot be determined for performance-based or time-accelerated options due to the nature of such awards, as detailed above.

The total unrecognized share-based compensation cost will be adjusted for future changes in estimated forfeitures.

15. Income Taxes

In general, the Company has not recorded a provision for federal or state income taxes as it has had cumulative net operating losses since inception.

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

	Year Ended December 31,		
	2016	2015	2014
Income tax benefit using U.S. federal statutory rate	$ (27,780)	$ (48,507)	$ (64,470)
Permanent differences	1,140	688	1,916
State income taxes, net of federal benefit	(4,606)	(4,826)	(5,632)
Non-deductible share-based compensation	3,528	3,824	3,584
Excess tax benefits	(5,453)	—	—
Fair market valuation of Note Hedge Warrants and Convertible Note Hedges	(3,160)	3,711	—
Tax credits	(3,014)	(1,987)	(2,652)
Expiring net operating losses and tax credits	39	194	3,590
Effect of change in state tax rate on deferred tax assets and deferred tax liabilities	(3,564)	(627)	5,490
Change in the valuation allowance	42,975	47,587	58,185
Other	(105)	(57)	(11)
	$ —	$ —	$ —

Components of the Company's deferred tax assets and liabilities are as follows (in thousands):

	Year Ended December 31,	
	2016	2015
Deferred tax assets:		
Net operating loss carryforwards	$ 333,442	$ 280,191
Tax credit carryforwards	36,963	33,996
Capitalized research and development	25,030	30,064
Contingent consideration	30,131	—
Deferred revenue	—	3,360
Share-based compensation	19,364	15,275
Basis difference on North America collaboration agreement	24,813	16,830
Accruals and reserves	17,144	19,034
Other	15,867	15,311
Total deferred tax assets	502,754	414,061
Deferred tax liabilities:		
Basis difference on 2022 Notes	(1,071)	(5,877)
Intangibles	(27,162)	—
Total deferred tax liabilities	(28,233)	(5,877)
Net deferred tax asset	474,521	408,184
Valuation allowance	(474,521)	(408,184)
Net deferred tax asset	$ —	$ —

Management of the Company has evaluated the positive and negative evidence bearing upon the realizability of its deferred tax assets. Management has considered the Company's history of operating losses and concluded, in accordance with the applicable accounting standards, that it is more likely than not that the Company will not realize the benefit of its deferred tax assets. Accordingly, the deferred tax assets have been fully reserved at December 31, 2016 and 2015. Management reevaluates the positive and negative evidence on a quarterly basis.

The valuation allowance increased approximately $66.3 million during the year ended December 31, 2016, primarily due to an increase in net operating losses, tax credit carryforwards, basis difference on the North America collaboration agreement and share-based compensation expense. During the year ended December 31, 2016, the Company closed the Lesinurad Transaction which resulted in an approximately $0.3 million deferred tax impact. Additionally, the 2016 change in valuation allowance noted in the table above reflects the impact of the Company's early adoption of ASC 2016-09 of an approximately $23.1 million increase in net operating losses recorded through retained earnings. The valuation allowance increased approximately $40.7 million during the year ended December 31, 2015, due primarily to an increase in the Company's tax credit carryforwards, capitalized research and development expenses and share-based compensation expense.

Subject to the limitations described below, at December 31, 2016 and 2015, the Company has net operating loss carryforwards of approximately $952.7 million and approximately $857.9 million, respectively, to offset future federal taxable income, which expire beginning in 2018 continuing through 2036. As of December 31, 2016 and 2015, the Company had state net operating loss carryforwards of approximately $686.2 million and approximately $566.7 million, respectively, to offset future state taxable income, which will begin to expire in 2027 and will continue to expire through 2036. The Company also had tax credit carryforwards of approximately $40.4 million and approximately $37.1 million as of December 31, 2016 and 2015, respectively, to offset future federal and state income taxes, which expire at various times through 2036.

Utilization of net operating loss carryforwards and research and development credit carryforwards may be subject to a substantial annual limitation due to ownership change limitations that could occur in the future in accordance with Section 382 of the Internal Revenue Code of 1986 ("IRC Section 382") and with Section 383 of the Internal Revenue Code of 1986, as well as similar state provisions. These ownership changes may limit the amount of net operating loss carryforwards and research and development credit carryforwards that can be utilized annually to offset future taxable income and taxes, respectively. In general, an ownership change, as defined by IRC Section 382, results from transactions increasing the ownership of certain stockholders or public groups in the stock of a corporation by more than 50 percentage points over a three-year period. The Company has completed several financings since its inception

which may result in a change in control as defined by IRC Section 382, or could result in a change in control in the future.

The following table summarizes the changes in the Company's unrecognized income tax benefits for the years ended December 31, 2016 and 2015 (in thousands):

	Year Ended December 31,	
	2016	2015
Balance at the beginning of the period	$ 17,614	$ —
Increases based on tax positions related to the current period	26,393	17,614
Increases for tax positions related to prior periods	—	10,174
Decreases for tax positions in prior periods	(17,614)	(10,174)
Decreases for statute of limitation expiration	—	—
Decreases for settlement of tax audits	—	—
Balance at the end of the period	$ 26,393	$ 17,614

The Company had gross unrecognized tax benefits of approximately $26.4 million and approximately $17.6 million as of December 31, 2016 and 2015, respectively. The Company did not have any unrecognized tax benefits as of December 31, 2014. Of the approximately $26.4 million of total unrecognized tax benefits at December 31, 2016, none of the unrecognized tax positions would, if recognized, affect the Company's effective tax rate, as this item only impacts the Company's deferred tax accounting.

The Company will recognize interest and penalties, if any, related to uncertain tax positions in income tax expense. As of December 31, 2016, 2015 and 2014, the Company had no accrued interest or penalties related to uncertain tax positions and no amounts have been recognized in the Company's consolidated statements of operations.

The statute of limitations for assessment by the Internal Revenue Service ("IRS") and state tax authorities is open for tax years ended December 31, 2015, 2014, and 2013, although carryforward attributes that were generated prior to tax year 2013 may still be adjusted upon examination by the IRS or state tax authorities if they either have been, or will be, used in a future period. There are currently no federal or state income tax audits in progress.

16. Defined Contribution Plan

The Ironwood Pharmaceuticals, Inc. 401(k) Savings Plan is a defined contribution plan in the form of a qualified 401(k) plan in which substantially all employees are eligible to participate upon employment. Subject to certain IRS limits, eligible employees may elect to contribute from 1% to 100% of their compensation. Company contributions to the plan are at the sole discretion of the Company's board of directors. Currently, the Company provides a matching contribution of 75% of the employee's contributions, up to $6,000 annually. During the years ended December 31, 2016, 2015 and 2014, the Company recorded approximately $3.2 million, approximately $2.5 million and approximately $2.6 million of expense related to its 401(k) company match, respectively.

17. Related Party Transactions

In September 2009, Allergan became a related party when the Company sold to Allergan 2,083,333 shares of the Company's convertible preferred stock. In November 2009, Almirall became a related party when the Company sold to Almirall 681,819 shares of the Company's convertible preferred stock (Note 5). These shares of preferred stock converted to the Company's Class B common stock on a 1:1 basis upon the completion of the Company's initial public offering in February 2010. At December 31, 2016, Almirall was no longer a related party because it converted and sold all such shares during the three months ended September 30, 2016. Amounts due to and due from Allergan are reflected as related party accounts payable and related party accounts receivable, respectively. These balances are reported net of any balances due to or from the related party. As of December 31, 2016 and 2015, the Company had approximately $63.9 million and approximately $51.6 million, respectively, in related party accounts receivable, net of related party accounts payable, associated with Allergan.

The Company has and currently obtains health insurance services for its employees from an insurance provider whose President and Chief Executive Officer became a member of the Company's Board of Directors in April 2016. The Company paid approximately $8.5 million and approximately $7.0 million in insurance premiums to this insurance

provider during the years ended December 31, 2016 and 2015, respectively. At December 31, 2016 and 2015, the Company had an insignificant amount and no accounts payable, respectively, due to this related party.

The Company entered into a research and collaboration agreement with a biotechnology company during 2016. The co-founder and Chief Executive Officer of this biotechnology company subsequently became a member of the Company's Board of Directors in January 2017. The Company paid an insignificant amount to this biotechnology company during the year ended December 31, 2016. At December 31, 2016, the Company had no accounts payable due to this related party.

18. Workforce Reduction

On January 8, 2014, the Company announced a headcount reduction of approximately 10% to align its workforce with its strategy. The field-based sales force and medical science liaison team were excluded from the workforce reduction.

During the three months ended March 31, 2014, the Company substantially completed the implementation of this reduction in workforce and, in accordance with ASC 420, *Exit or Disposal Cost Obligations*, recorded approximately $4.3 million of costs, including employee severance, benefits and related costs. These costs were reflected in the consolidated statement of operations as approximately $3.0 million in research and development expenses and approximately $1.2 million in selling, general and administrative expenses. The Company did not record any additional charges associated with this workforce reduction during the years ended December 31, 2016 and 2015. All payments related to this reduction in workforce were made by the end of 2014.

19. Selected Quarterly Financial Data (Unaudited)

The following table contains quarterly financial information for the years ended December 31, 2016 and 2015. The Company believes that the following information reflects all normal recurring adjustments necessary for a fair presentation of the information for the periods presented. The operating results for any quarter are not necessarily indicative of results for any future period.

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Total Year
	(in thousands, except per share data)				
2016					
Collaborative arrangements revenue [1]	$ 66,042	$ 54,350	$ 66,106	$ 87,459	$ 273,957
Total cost and expenses [2]	68,010	69,665	94,393	93,759	325,827
Other (expense) income, net [3]	(11,329)	(6,387)	(4,917)	(7,205)	(29,838)
Net loss	(13,297)	(21,702)	(33,204)	(13,505)	(81,708)
Net loss per share--basic and diluted	$ (0.09)	$ (0.15)	$ (0.23)	$ (0.09)	$ (0.56)

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Total Year
	(in thousands, except per share data)				
2015					
Collaborative arrangements revenue	$ 28,932	$ 27,744	$ 39,572	$ 53,307	$ 149,555
Total cost and expenses [4]	56,999	69,753	65,757	59,134	251,643
Other (expense) income, net [5]	(5,155)	(6,011)	(21,205)	(8,210)	(40,581)
Net loss	(33,222)	(48,020)	(47,390)	(14,037)	(142,669)
Net loss per share--basic and diluted	$ (0.24)	$ (0.34)	$ (0.33)	$ (0.09)	$ (1.00)

(1) Collaborative arrangements revenue includes the achievement of $30.0 million related to the receipt of milestone payments under the license agreement with Astellas, consisting of $15.0 million for the filing of an NDA for LINZESS with the Japanese Ministry of Health, Labor and Welfare during the first quarter of the year ended December 31, 2016, and $15.0 million for the subsequent approval of the NDA during the fourth quarter of the year ended December 31, 2016.

(2) Total costs and expenses for the third and fourth quarters of the year ended December 31, 2016 includes approximately $3.2 million and a subsequent reduction of approximately $3.3 million, respectively, related to the

amortization of acquired intangible asset, as well as approximately $8.7 million and approximately $1.1 million during the third and fourth quarters, respectively, as a loss on fair value remeasurement of contingent consideration

(3) Other (expense) income, net for the year ended December 31, 2016 includes a loss of approximately $1.6 million for the first quarter, and gains of approximately $3.1 million, approximately $4.5 million, and approximately $2.1 million in the second, third and fourth quarters of 2016, respectively, related to gain on derivatives. The gain on derivatives for the year ended December 31, 2016 consists of the change in fair value of the Company's Convertible Note Hedges and Note Hedge Warrants, which are recorded as derivative assets and liabilities. The Convertible Note Hedges and the Note Hedge Warrants are recorded at fair value at each reporting period and changes in fair value are recorded in the Company's consolidated statements of operations (Note 6).

(4) Total costs and expenses for the second and third quarter of the year ended December 31, 2015 includes approximately $8.2 million and $9.4 million, respectively, related to a write down of inventory to net realizable value and accruals for excess non-cancelable inventory purchase commitments (Note 8).

(5) Other (expense) income, net for the second and third quarters of the year ended December 31, 2015 includes approximately $0.2 million and $11.4 million, respectively, as a loss on derivatives. Other (expense) income, net for the fourth quarter of the year ended December 31, 2015 includes approximately $1.6 million, as a gain on derivatives. The gain (loss) on derivatives consists of the change in fair value of the Company's Convertible Note Hedges and Note Hedge Warrants, which are recorded as derivative assets and liabilities. The Convertible Note Hedges and the Note Hedge Warrants are recorded at fair value at each reporting period and changes in fair value are recorded in the Company's consolidated statements of operations (Note 6).

20. Subsequent Events

On the Funding Date, January 5, 2017, the Company issued $150.0 million in aggregate principal amount for the 2026 Notes. The proceeds from the issuance of the 2026 Notes were primarily used to redeem the outstanding principal balance of the PhaRMA Notes.

In January 2017, the Company and Allergan entered into an amendment to the European License Agreement pursuant to which the license granted to Allergan was extended to a territory consisting of all countries worldwide not previously covered by the European License Agreement, other than China, Hong Kong, Macau, Japan, and the countries and territories of North America. On a country-by-country and product-by-product basis in such additional territory, Allergan will pay the Company an annual royalty as a percentage of net sales of products containing linaclotide as an active ingredient in the upper-single digits for five years following the first commercial sale of a linaclotide product in a country, and in the low-double digits thereafter. The royalty rate for products in expanded territory will decrease, on a country-by-country basis, to the lower-single digits, or cease entirely, following the occurrence of certain events. Allergan will also assume certain purchase commitments for quantities of linaclotide API under the Company's agreements with third-party API suppliers. Concurrently with entering into the amendment to the European License Agreement, the Company and Allergan entered into a commercial agreement under which the adjustments to the Company's or Allergan's share of the net profits under the share adjustment provision of the collaboration agreement for linaclotide in North America are eliminated, in full, in 2018 and all subsequent years. In addition, Allergan appointed the Company, on a non-exclusive basis, to promote CANASA, approved for the treatment of ulcerative proctitis, and DELZICOL, approved for the treatment of ulcerative colitis, in the U.S. for approximately two years. The Company will perform certain third position details and offer samples of such products to gastroenterology prescribers who are on the then-current call panel for LINZESS to which the Company provides first or second position details, and will purchase samples of CANASA and DELZICOL from Allergan at the actual manufacturing cost. On a product-by-product basis, Allergan will pay the Company a royalty in the mid-teens on incremental sales of CANASA and DELZICOL above a mutually agreed upon sales baseline. The Company expects to commence these promotion activities on or about February 27, 2017 and, subject to the Company's or Allergan's rights of early termination, the commercial agreement will expire on February 26, 2019. The share adjustment relief will, in the case of Allergan's termination for convenience and certain other specified circumstances, survive termination of the commercial agreement.

Exhibit Index

Number	Description	Incorporated by reference herein	
		Form	Date
3.1	Eleventh Amended and Restated Certificate of Incorporation	Annual Report on Form 10-K (File No. 001-34620)	March 30, 2010
3.2	Fifth Amended and Restated Bylaws	Annual Report on Form 10-K (File No. 001-34620)	March 30, 2010
4.1	Specimen Class A common stock certificate	Registration Statement on Form S-1, as amended (File No. 333-163275)	January 20, 2010
4.2	Eighth Amended and Restated Investors' Rights Agreement, dated as of September 1, 2009, by and among Ironwood Pharmaceuticals, Inc., the Founders and the Investors named therein	Registration Statement on Form S-1, as amended (File No. 333-163275)	November 20, 2009
4.3	Indenture, dated as of June 15, 2015, by and between Ironwood Pharmaceuticals, Inc. and U. S. Bank National Association (including the form of the 2.25% Convertible Senior Note due 2022)	Form 8-K (File No. 001-34620)	June 15, 2015
4.4	Indenture, dated as of September 23, 2016, by and between Ironwood Pharmaceuticals, Inc. and U.S. Bank National Association (including the form of the 8.375% Notes due 2026)	Form 8-K (File No. 001-34620)	September 26, 2016
10.1#	Amended and Restated 2002 Stock Incentive Plan and form agreements thereunder	Registration Statement on Form S-1, as amended (File No. 333-163275)	December 23, 2009
10.2#	Amended and Restated 2005 Stock Incentive Plan and form agreements thereunder	Registration Statement on Form S-1, as amended (File No. 333-163275)	January 29, 2010
10.3#	Amended and Restated 2010 Employee, Director and Consultant Equity Incentive Plan	Registration Statement on Form S-8, as amended (File No. 333-184396)	October 12, 2012
10.3.1#	Form of Stock Option Agreement under the Amended and Restated 2010 Employee, Director and Consultant Equity Incentive Plan	Annual Report on Form 10-K (File No. 001-34620)	February 18, 2015
10.3.2#	Form of Non-employee Director Restricted Stock Agreement under the Amended and Restated 2010 Employee, Director and Consultant Equity Incentive Plan	Annual Report on Form 10-K (File No. 001-34620)	February 18, 2015
10.3.3#	Form of Restricted Stock Unit Agreement under the Amended and Restated 2010 Employee, Director and Consultant Equity Incentive Plan	Annual Report on Form 10-K (File No. 001-34620)	February 18, 2015
10.4#	Amended and Restated 2010 Employee Stock Purchase Plan	Annual Report on Form 10-K (File No. 001-34620)	February 21, 2013

Number	Description	Incorporated by reference herein	
		Form	Date
10.5#	Change of Control Severance Benefit Plan, as amended and restated	Quarterly Report on Form 10-Q (File No. 001-34620)	April 29, 2014
10.6#	Form of Executive Severance Agreement	Annual Report on Form 10-K (File No. 001-34620)	February 18, 2015
10.7#	Director Compensation Plan effective January 1, 2014	Annual Report on Form 10-K (File No. 001-34620)	February 7, 2014
10.8#	Form of Indemnification Agreement with Directors and Officers	Registration Statement on Form S-1, as amended (File No. 333-163275)	December 23, 2009
10.9#	Consulting Agreement, dated as of December 16, 2014, by and between Christopher Walsh and Ironwood Pharmaceuticals, Inc.	Annual Report on Form 10-K (File No. 001-34620)	February 18, 2015
10.10#	Consulting Agreement, dated December 3, 2014, by and between Lawrence S. Olanoff and Ironwood Pharmaceuticals, Inc.	Quarterly Report on Form 10-Q (File No. 001-34620)	May 6, 2015
10.11+	Collaboration Agreement, dated as of September 12, 2007, as amended on November 3, 2009, by and between Forest Laboratories, Inc. and Ironwood Pharmaceuticals, Inc.	Registration Statement on Form S-1, as amended (File No. 333-163275)	February 2, 2010
10.11.1	Amendment No. 2 to the Collaboration Agreement, dated as of January 8, 2013, by and between Forest Laboratories, Inc. and Ironwood Pharmaceuticals, Inc.	Annual Report on Form 10-K (File No. 001-34620)	February 21, 2013
10.12+	License Agreement, dated as of April 30, 2009, by and between Allergan Pharmaceuticals International Ltd. (formerly with Almirall, S.A.) and Ironwood Pharmaceuticals, Inc.	Registration Statement on Form S-1, as amended (File No. 333-163275)	February 2, 2010
10.12.1+	Amendment No. 1 to License Agreement, dated as of June 11, 2013, by and between Allergan Pharmaceuticals International Ltd. (formerly with Almirall, S.A.) and Ironwood Pharmaceuticals, Inc.	Quarterly Report on Form 10-Q (File No. 001-34620)	August 8, 2013
10.12.2+	Amendment to the License Agreement, dated as of October 26, 2015, by and between Allergan Pharmaceuticals International Ltd. and Ironwood Pharmaceuticals, Inc.	Annual Report on Form 10-K (File No. 001-34620)	February 19, 2016
10.13+	Novation Agreement, dated as of October 26, 2015, by and among Almirall, S.A., Allergan Pharmaceuticals International Ltd. and Ironwood Pharmaceuticals, Inc.	Annual Report on Form 10-K (File No. 001-34620)	February 19, 2016

Number	Description	Incorporated by reference herein	
		Form	Date
10.14+	License Agreement, dated as of November 10, 2009, by and among Astellas Pharma Inc. and Ironwood Pharmaceuticals, Inc.	Registration Statement on Form S-1, as amended (File No. 333-163275)	February 2, 2010
10.15+	Collaboration Agreement, dated as of October 23, 2012, by and between AstraZeneca AB and Ironwood Pharmaceuticals, Inc.	Annual Report on Form 10-K (File No. 001-34620)	February 21, 2013
10.16+	License Agreement, dated as of April 26, 2016, by and between Ardea Biosciences, Inc. and Ironwood Pharmaceuticals, Inc.	Quarterly Report on Form 10-Q (File No. 001-34620)	August 8, 2016
10.17+	Commercial Supply Agreement, dated as of June 23, 2010, by and among PolyPeptide Laboratories, Inc. and Polypeptide Laboratories (SWEDEN) AB, Forest Laboratories, Inc. and Ironwood Pharmaceuticals, Inc.	Quarterly Report on Form 10-Q (File No. 001-34620)	August 10, 2010
10.18+	Commercial Supply Agreement, dated as of March 28, 2011, by and among Corden Pharma Colorado, Inc. (f/k/a Roche Colorado Corporation), Ironwood Pharmaceuticals, Inc. and Forest Laboratories, Inc.	Quarterly Report on Form 10-Q (File No. 001-34620)	May 13, 2011
10.18.1+	Amendment No. 3 to Commercial Supply Agreement, dated as of November 26, 2013, by and between Corden Pharma Colorado, Inc. (f/k/a Roche Colorado Corporation), Ironwood Pharmaceuticals, Inc. and Forest Laboratories, Inc.	Annual Report on Form 10-K (File No. 001-34620)	February 7, 2014
10.19+	Commercial Supply Agreement, dated as of April 26, 2016, by and between AstraZeneca Pharmaceuticals LP and Ironwood Pharmaceuticals, Inc.	Quarterly Report on Form 10-Q (File No. 001-34620)	August 8, 2016
10.20	Lease for facilities at 301 Binney St., Cambridge, MA, dated as of January 12, 2007, as amended on April 9, 2009, by and between Ironwood Pharmaceuticals, Inc. and BMR-Rogers Street LLC	Registration Statement on Form S-1, as amended (File No. 333-163275)	December 23, 2009
10.20.1	Second Amendment to Lease for facilities at 301 Binney St., Cambridge, MA, dated as of February 9, 2010, by and between Ironwood Pharmaceuticals, Inc. and BMR-Rogers Street LLC	Annual Report on Form 10-K (File No. 001-34620)	March 30, 2010

Number	Description	Incorporated by reference herein	
		Form	Date
10.20.2	Third Amendment to Lease for facilities at 301 Binney St., Cambridge, MA, dated as of July 1, 2010, by and between Ironwood Pharmaceuticals, Inc. and BMR-Rogers Street LLC	Annual Report on Form 10-K (File No. 001-34620)	March 30, 2011
10.20.3	Fourth Amendment to Lease for facilities at 301 Binney St., Cambridge, MA, dated as of February 3, 2011, by and between Ironwood Pharmaceuticals, Inc. and BMR-Rogers Street LLC	Annual Report on Form 10-K (File No. 001-34620)	March 30, 2011
10.20.4	Fifth Amendment to Lease for facilities at 301 Binney St., Cambridge, MA, dated as of October 18, 2011, by and between Ironwood Pharmaceuticals, Inc. and BMR-Rogers Street LLC	Annual Report on Form 10-K (File No. 001-34620)	February 29, 2012
10.20.5	Sixth Amendment to Lease for facilities at 301 Binney St., Cambridge, MA, dated as of July 19, 2012, by and between Ironwood Pharmaceuticals, Inc. and BMR-Rogers Street LLC	Annual Report on Form 10-K (File No. 001-34620)	February 21, 2013
10.20.6	Seventh Amendment to Lease for facilities at 301 Binney St., Cambridge, MA, dated as of October 30, 2012, by and between Ironwood Pharmaceuticals, Inc. and BMR-Rogers Street LLC	Annual Report on Form 10-K (File No. 001-34620)	February 21, 2013
10.20.7	Eighth Amendment to Lease for facilities at 301 Binney St., Cambridge, MA, dated as of July 8, 2014, by and between Ironwood Pharmaceuticals, Inc. and BMR-Rogers Street LLC	Annual Report on Form 10-K (File No. 001-34620)	February 18, 2015
10.20.8	Ninth Amendment to Lease for facilities at 301 Binney St., Cambridge, MA, dated as of October 27, 2014, by and between Ironwood Pharmaceuticals, Inc. and BMR-Rogers Street LLC	Annual Report on Form 10-K (File No. 001-34620)	February 18, 2015
10.20.9	Tenth Amendment to Lease for facilities at 301 Binney St., Cambridge, MA, dated as of January 21, 2015, by and between Ironwood Pharmaceuticals, Inc. and BMR-Rogers Street LLC	Annual Report on Form 10-K (File No. 001-34620)	February 18, 2015
10.20.10*	Eleventh Amendment to Lease for facilities at 301 Binney St., Cambridge, MA, dated as of June 30, 2016, by and between Ironwood Pharmaceuticals, Inc. and BMR-Rogers Street LLC		

Number	Description	Incorporated by reference herein	
		Form	Date
10.20.11	Sublease, dated as of July 1, 2014, by and between Biogen Idec MA Inc. and Ironwood Pharmaceuticals, Inc. to Lease for facilities at 301 Binney St., Cambridge, MA, as amended, by and between Ironwood Pharmaceuticals, Inc. and BMR-Rogers Street LLC	Annual Report on Form 10-K (File No. 001-34620)	February 18, 2015
10.21	Base Call Option Transaction Confirmation, dated as of June 10, 2015, between Ironwood Pharmaceuticals, Inc. and JPMorgan Chase Bank, National Association, London Branch	Quarterly Report on Form 10-Q (File No. 001-34620)	August 7, 2015
10.22	Base Call Option Transaction Confirmation, dated as of June 10, 2015, between Ironwood Pharmaceuticals, Inc. and Credit Suisse Capital LLC, through its agent Credit Suisse Securities (USA) LLC	Quarterly Report on Form 10-Q (File No. 001-34620)	August 7, 2015
10.23	Base Warrants Confirmation, dated as of June 10, 2015, between Ironwood Pharmaceuticals, Inc. and JPMorgan Chase Bank, National Association, London Branch	Quarterly Report on Form 10-Q (File No. 001-34620)	August 7, 2015
10.24	Base Warrants Confirmation, dated as of June 10, 2015, between Ironwood Pharmaceuticals, Inc. and Credit Suisse Capital LLC, through its agent Credit Suisse Securities (USA) LLC	Quarterly Report on Form 10-Q (File No. 001-34620)	August 7, 2015
10.25	Additional Call Option Transaction Confirmation, dated as of June 22, 2015, between Ironwood Pharmaceuticals, Inc. and JPMorgan Chase Bank, National Association, London Branch	Quarterly Report on Form 10-Q (File No. 001-34620)	August 7, 2015
10.26	Additional Call Option Transaction Confirmation, dated as of June 22, 2015, between Ironwood Pharmaceuticals, Inc. and Credit Suisse Capital LLC, through its agent Credit Suisse Securities (USA) LLC	Quarterly Report on Form 10-Q (File No. 001-34620)	August 7, 2015
10.27	Additional Warrants Confirmation, dated as of June 22, 2015, between Ironwood Pharmaceuticals, Inc. and JPMorgan Chase Bank, National Association, London Branch	Quarterly Report on Form 10-Q (File No. 001-34620)	August 7, 2015

Number	Description	Incorporated by reference herein	
		Form	Date
10.28	Additional Warrants Confirmation, dated as of June 22, 2015, between Ironwood Pharmaceuticals, Inc. and Credit Suisse Capital LLC, through its agent Credit Suisse Securities (USA) LLC	Quarterly Report on Form 10-Q (File No. 001-34620)	August 7, 2015
21.1*	Subsidiaries of Ironwood Pharmaceuticals, Inc.		
23.1*	Consent of Independent Registered Public Accounting Firm		
31.1*	Certification of Chief Executive Officer pursuant to Rules 13a-14 or 15d-14 of the Exchange Act		
31.2*	Certification of Chief Financial Officer pursuant to Rules 13a-14 or 15d-14 of the Exchange Act		
32.1‡	Certification of Chief Executive Officer pursuant to Rules 13a-14(b) or 15d-14(b) of the Exchange Act and 18 U.S.C. Section 1350		
32.2‡	Certification of Chief Financial Officer pursuant to Rules 13a-14(b) or 15d-14(b) of the Exchange Act and 18 U.S.C. Section 1350		
101.INS*	XBRL Instance Document		
101.SCH*	XBRL Taxonomy Extension Schema Document		
101.CAL*	XBRL Taxonomy Extension Calculation Linkbase Document		
101.LAB*	XBRL Taxonomy Extension Label Linkbase Database		
101.PRE*	XBRL Taxonomy Extension Presentation Linkbase Document		
101.DEF*	XBRL Taxonomy Extension Definition Linkbase Document		

* Filed herewith.

‡ Furnished herewith.

\+ Confidential treatment granted under 17 C.F.R. §§200.80(b)(4) and 230.406. The confidential portions of this exhibit have been omitted and are marked accordingly. The confidential portions have been provided separately to the SEC pursuant to the confidential treatment request.

\# Management contract or compensatory plan, contract, or arrangement.

Item 16. ***10-K Summary***

None.

Exhibit 10.20.10

ELEVENTH AMENDMENT TO LEASE

THIS ELEVENTH AMENDMENT TO LEASE (this "Amendment") is entered into as of this 30th day of June, 2016 (the "Execution Date"), by and between BMR-ROGERS STREET LLC, a Delaware limited liability company ("Landlord," as successor-in-interest to Rogers Street, LLC ("Original Landlord")), and IRONWOOD PHARMACEUTICALS, INC., a Delaware corporation ("Tenant," formerly known as Microbia, Inc.).

RECITALS

A. WHEREAS, Original Landlord and Tenant entered into that certain Lease dated as of January 12, 2007, as amended by that certain First Amendment to Lease dated as of April 9, 2009, that certain Second Amendment to Lease dated as of February 9, 2010, that certain Third Amendment to Lease dated as of July 1, 2010, that certain Fourth Amendment to Lease dated as of February 3, 2011, that certain Fifth Amendment to Lease dated as of October 18, 2011, that certain Sixth Amendment to Lease dated as of July 19, 2012, that certain Seventh Amendment to Lease dated as of October 30, 2012 (the "Seventh Amendment"), that certain Eighth Amendment to Lease dated as of July 8, 2014 (the "Eighth Amendment"), that certain Ninth Amendment to Lease dated as of October 27, 2014, and that certain Tenth Amendment to Lease dated as of January 21, 2015 (the "Tenth Amendment") (collectively, and as the same may have been heretofore further amended, amended and restated, supplemented or modified from time to time, the "Existing Lease"), whereby Tenant leases certain premises (the "Premises") from Landlord at 301 Binney Street in Cambridge, Massachusetts (the "Building"):

B. WHEREAS, pursuant to the Seventh Amendment, Landlord and Tenant agreed to extend the Initial Term of the Lease by twenty-four (24) months, with the period of time from February 1, 2016 through January 31, 2018 defined as the "Extension Term";

C. WHEREAS, the Existing Lease provided a method for determining the Base Rent for the Premises during the Extension Term and the parties conclusively agreed upon such determination pursuant to that certain letter agreement dated April 26, 2016 (the "FMV Rent Letter");

D. WHEREAS, Landlord and Tenant now desire to memorialize in an amendment to the Existing Lease the agreed-upon Base Rent for the Premises during the Extension Term; and

E. WHEREAS, Landlord and Tenant desire to modify and amend the Existing Lease only in the respects and on the conditions hereinafter stated.

AGREEMENT

NOW, THEREFORE, Landlord and Tenant, in consideration of the mutual promises contained herein and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, and intending to be legally bound, agree as follows:

1. Definitions. For purposes of this Amendment, capitalized terms shall have the meanings ascribed to them in the Existing Lease unless otherwise defined herein. The Existing Lease, as amended by this Amendment, is referred to collectively herein as the "Lease."

2. Base Rent during the Extension Term. Effective as of the first day of the Extension Term, Base Rent due to Landlord under the Lease shall be as follows:

Dates	Square Feet of Rentable Area	Base Rent per Square Foot of Rentable Area	Monthly Base Rent	Annual Base Rent
2/1/2016 – 5/31/2016	8,693 (Additional Premises 1st Floor)	$0 annually	$0	-
	23,187 (Additional Premises Fifth Phase Stage 4)	$0 annually	$0	-
	279,822 (Balance of Premises)	$67.00 annually	$1,562,339.50	-
6/1/2016 – 1/31/2018	8,693 (Additional Premises 1st Floor)	$0 annually	$0	$0
	303,009 (Balance of Premises)	$67.00 annually	$1,691,800.25	$20,301,603.00

For clarity, (a) pursuant to the Tenth Amendment, Tenant shall have no obligation to pay Base Rent with respect to the Additional Premises Fifth Phase Stage 4 (as defined in the Tenth Amendment) during the Extension Term until June 1, 2016, (b) pursuant to the Eighth Amendment, Tenant shall have no obligation to pay Base Rent with respect to the Additional Premises 1st Floor (as defined in the Eighth Amendment) during the entire Extension Term; provided, however, such abatement of Base Rent with respect to the Additional Premises 1st Floor shall not apply to any further extension of the Term pursuant to an Option, and (c) notwithstanding anything in the Existing Lease to the contrary, Base Rent shall not increase during the Extension Term except as shown in the above chart.

To the extent Landlord charged Tenant, and Tenant paid, Base Rent for any portion of the Extension Term prior to the Execution Date at a rate lower or higher than the applicable rate set forth in this Section 2, then Landlord shall calculate and either charge or credit Tenant (as applicable) the difference between the amount of Base Rent Tenant actually paid and the amount of Base Rent applicable for such portion of the Extension Term pursuant to this Section 2. Such amount, to the extent undisputed by the parties, shall be paid by Tenant or credited by Landlord (as applicable) within forty-five (45) days of receipt by Tenant of written notice from Landlord showing in detail such calculation and the difference in actual Base Rent paid by Tenant.

3. Broker. Tenant represents and warrants that other than Cassidy Turley Commercial Real Estate Services, Inc., d/b/a Cushman & Wakefield ("Broker"), it has had no

dealings with any real estate broker or agent in connection with the negotiation of this Amendment, and that it knows of no real estate broker or agent that is or might be entitled to a commission in connection with the representation of Tenant in connection with this Amendment. Broker is not entitled to any commission pursuant to this Amendment.

(a) Tenant represents and warrants that no broker or agent has made any representation or warranty relied upon by Tenant in Tenant's decision to enter into this Amendment, other than as contained in this Amendment.

(b) Tenant acknowledges and agrees that the employment of brokers by Landlord is for the purpose of solicitation of offers of leases from prospective tenants and that no authority is granted to any broker to furnish any representation (written or oral) or warranty from Landlord unless expressly contained within this Amendment. Landlord is executing this Amendment in reliance upon Tenant's representations, warranties and agreements contained within Section 3, Section 3(a) and this Section 3(b).

(c) Tenant agrees to indemnify, save, defend and hold Landlord harmless from any and all cost or liability for compensation claimed by Broker, any other broker or agent, employed or engaged by Tenant or claiming to have been employed or engaged by Tenant.

(d) Landlord agrees to indemnify, save, defend and hold Tenant harmless from any and all cost or liability for compensation claimed by any broker or agent employed or engaged by Landlord or claiming to have been employed or engaged by Landlord, including Transwestern RBJ, LLC ("Landlord Broker"). No commission, fee or other compensation is due to Landlord Broker or any other Landlord broker(s) in connection with this Amendment.

4 . Default. Tenant represents, warrants and covenants that, to the best of Tenant's knowledge, Landlord and Tenant are not in default of any of their respective obligations under the Lease and no event has occurred that, with the passage of time or the giving of notice (or both) would constitute a default by either Landlord or Tenant thereunder. Landlord represents, warrants and covenants that, to the best of Landlord's knowledge, Landlord and Tenant are not in default of any of their respective obligations under the Lease and no event has occurred that, with the passage of time or the giving of notice (or both) would constitute a default by either Landlord or Tenant thereunder.

5 . Effect of Amendment. Except as modified by this Amendment, the Existing Lease and all the covenants, agreements, terms, provisions and conditions thereof shall remain in full force and effect and are hereby ratified and affirmed. In the event of any conflict between the terms contained in this Amendment and the Existing Lease or the FMV Rent Letter, the terms herein contained shall supersede and control the obligations and liabilities of the parties. From and after the date hereof, the term "Lease" as used in the Lease shall mean the Existing Lease, as modified by this Amendment.

6 . Successors and Assigns. Each of the covenants, conditions and agreements contained in this Amendment shall inure to the benefit of and shall apply to and be binding upon the parties hereto and their respective heirs, legatees, devisees, executors, administrators and

permitted successors and assigns and sublessees. Nothing in this section shall in any way alter the provisions of the Lease restricting assignment or subletting.

7. Miscellaneous. This Amendment becomes effective only upon execution and delivery hereof by Landlord and Tenant. The captions of the paragraphs and subparagraphs in this Amendment are inserted and included solely for convenience and shall not be considered or given any effect in construing the provisions hereof. All exhibits hereto are incorporated herein by reference. Submission of this instrument for examination or signature by Tenant does not constitute a reservation of or option for a lease, and shall not be effective as a lease, lease amendment or otherwise until execution by and delivery to both Landlord and Tenant.

8. Authority. Landlord and Tenant have all necessary and proper authority, without the need for the consent of any other person or entity, other than any consents that have been obtained, to enter into and perform under this Amendment.

9. Counterparts; Facsimile and PDF Signatures. This Amendment may be executed in one or more counterparts, each of which, when taken together, shall constitute one and the same document. A facsimile or portable document format (PDF) signature on this Amendment shall be equivalent to, and have the same force and effect as, an original signature.

[REMAINDER OF THIS PAGE INTENTIONALLY LEFT BLANK]

IN WITNESS WHEREOF, Landlord and Tenant have executed this Amendment as a sealed Massachusetts instrument as of the date and year first above written.

LANDLORD:

BMR-ROGERS STREET LLC,
a Delaware limited liability company

By: /s/ William Kane
Name: William Kane
Title: Senior Vice President East Coast Leasing

TENANT:

IRONWOOD PHARMACEUTICALS, INC.,
a Delaware corporation

By: /s/ Thomas Graney
Name: Thomas Graney
Title: CFO

Exhibit 21.1

List of Registrant's Subsidiaries

Ironwood Pharmaceuticals Securities Corporation, incorporated in Massachusetts, a wholly owned subsidiary.

Ironwood Pharmaceuticals GmbH, incorporated in Switzerland, a wholly owned subsidiary.

EXHIBIT 23.1

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We consent to the incorporation by reference in the following Registration Statements (Form S-3 Nos. 333-179430 and 333-199885 and Form S-8 Nos. 333-165227, 333-165228, 333-165229, 333-165230, 333-165231, 333-184396, 333-189339, 333-189340, 333-197874, 333-197875, 333-206227, 333-206228, 333-213001, and 333-213002) of Ironwood Pharmaceuticals, Inc. and in the related Prospectuses of our reports dated February 22, 2017, with respect to the consolidated financial statements of Ironwood Pharmaceuticals, Inc., and the effectiveness of internal control over financial reporting of Ironwood Pharmaceuticals, Inc., included in this Annual Report (Form 10-K) for the year ended December 31, 2016.

/s/ Ernst & Young LLP

Boston, Massachusetts
February 22, 2017

EXHIBIT 31.1

CERTIFICATION PURSUANT
TO RULE 13a-14(a) UNDER
THE SECURITIES EXCHANGE ACT OF 1934

I, Peter M. Hecht, certify that:

1. I have reviewed this Annual Report on Form 10-K of Ironwood Pharmaceuticals, Inc. (the "registrant");

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

   a. Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   b. Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   c. Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   d. Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. 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 22, 2017

/s/ Peter M. Hecht
Peter M. Hecht
Chief Executive Officer

EXHIBIT 31.2

CERTIFICATION PURSUANT
TO RULE 13a-14(a) UNDER
THE SECURITIES EXCHANGE ACT OF 1934

I, Thomas Graney, certify that:

1. I have reviewed this Annual Report on Form 10-K of Ironwood Pharmaceuticals, Inc. (the "registrant");

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

   a. Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   b. Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   c. Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   d. Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. 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 22, 2017

/s/ Thomas Graney
Thomas Graney
Chief Financial Officer

EXHIBIT 32.1

CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Annual Report of Ironwood Pharmaceuticals, Inc. (the "Company") on Form 10-K for the period ended December 31, 2016 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Peter M. Hecht, Chief Executive Officer of the Company, certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, to my knowledge that:

(1) The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended; 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/ Peter M. Hecht
Peter M. Hecht
Chief Executive Officer
February 22, 2017

A signed original of this written statement required by Section 906 has been provided to the Company and will be retained by the Company and furnished to the Securities and Exchange Commission or its staff upon request.

EXHIBIT 32.2

CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Annual Report of Ironwood Pharmaceuticals, Inc. (the "Company") on Form 10-K for the period ended December 31, 2016 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Thomas Graney, Chief Financial Officer of the Company, certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, to my knowledge that:

(1) The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended; 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/ Thomas Graney
Thomas Graney
Chief Financial Officer
February 22, 2017

A signed original of this written statement required by Section 906 has been provided to the Company and will be retained by the Company and furnished to the Securities and Exchange Commission or its staff upon request.