AERIE PHARMACEUTICALS INC
Form 10-K
February 27, 2015
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UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, DC 20549

FORM 10-K

(Mark One)
ý ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the fiscal year ended December 31, 2014
or
o TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
Commission File Number: 001-36152

Aerie Pharmaceuticals, Inc.
(Exact name of registrant as specified in its charter)

Delaware	20-3109565
(State or other jurisdiction of incorporation or organization)	(IRS Employer Identification No.)

2030 Main Street, Suite 1500
Irvine, California 92614
(949) 526-8700
(Address, including zip code, and telephone number, including area code, of registrant's principal executive offices)

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

Title of Each Class	Name of Each Exchange on Which Registered
Common Stock, $0.001 par value per share	NASDAQ Global Market

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

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes o No ý
Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or 15(d) of the Act. Yes o No ý
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 ý No o

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files): Yes ý No o

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 the 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. o

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

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

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

The aggregate market value of the voting stock held by non-affiliates of the registrant on June 30, 2014, based upon the closing price of $24.77 of the registrant's common stock as reported on the NASDAQ Global Market, was $172,438,000. Shares of the registrant's common stock held by each officer and director and each person known to the registrant to own 10% or more of the outstanding voting power of the registrant have been excluded because such persons may be deemed affiliates. This determination of affiliate status is not a determination for other purposes.

As of February 20, 2015, the registrant had 24,046,939 shares of common stock, $0.001 par value, issued and outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's definitive proxy statement (the "Proxy Statement") for the 2015 Annual Meeting of Stockholders are incorporated by reference into Part III of this Annual Report on Form 10-K. The Proxy Statement will be filed with the Securities and Exchange Commission (the "SEC") within 120 days of the registrant's fiscal year ended December 31, 2014.

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SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This report contains forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended (the "Securities Act"), and Section 21E of the Securities Exchange Act of 1934, as amended (the "Exchange Act"). We may, in some cases, use terms such as "predicts," "believes," "potential," "proposed," "continue," "estimates," "anticipates," "expects," "plans," "intends," "may," "would," "could," "might," "will," "should," "exploring," "pursuing" or ot convey uncertainty of future events or outcomes to identify these forward-looking statements.

Forward-looking statements appear in a number of places throughout this report and include statements regarding our intentions, beliefs, projections, outlook, analyses or current expectations concerning, among other things:

- the success, timing and cost of our ongoing and anticipated preclinical studies and clinical trials for our current and potential future product candidates, including statements regarding the timing of initiation and completion of the studies and trials;
- our expectations regarding the clinical effectiveness of our product candidates and results of our clinical trials;
- the timing of and our ability to obtain and maintain U.S. Food and Drug Administration ("FDA") or other regulatory authority approval of, or other action with respect, to our product candidates;
- our expectations related to the use of proceeds from our initial public offering ("IPO") in October 2013 and the issuance and sale of the 2014 Convertible Notes (as defined herein) in September 2014;
- our estimates regarding anticipated capital requirements and our needs for additional financing;
- the commercial launch and potential future sales of our current or any other future product candidates;
- our commercialization, marketing and manufacturing capabilities and strategy;
- third-party payor reimbursement for our product candidates;
- the glaucoma patient market size and the rate and degree of market adoption of our product candidates by eye-care professionals and patients;
- the timing, cost or other aspects of the commercial launch of our product candidates;
- our plans to pursue development of our product candidates for additional indications and other therapeutic opportunities;
- the potential advantages of our product candidates;
- our plans to explore possible uses of our existing proprietary compounds beyond glaucoma;
- our ability to protect our proprietary technology and enforce our intellectual property rights;
- our expectations regarding collaborations, licensing, acquisitions and strategic operations, including our ability to in-license or acquire additional ophthalmic products or product candidates; and
- our mission to build a major ophthalmic pharmaceutical company.

By their nature, forward-looking statements involve risks and uncertainties because they relate to events, competitive dynamics and industry change, and depend on regulatory approvals and economic and other environmental circumstances that may or may not occur in the future or may occur on longer or shorter timelines than anticipated. We discuss many of these risks in greater detail under the heading "Risk Factors" in Part I, Item 1A of this report and elsewhere in this report. You should not rely upon forward-looking statements as predictions of future events.

Although we believe that we have a reasonable basis for each forward-looking statement contained in this report, we caution you that forward-looking statements are not guarantees of future performance and that our actual results of operations, financial condition and liquidity, and the development of the industry in which we operate may differ materially from the forward-looking statements contained in this report. In addition, even if our results of operations, financial condition and liquidity, and events in the industry in which we operate are consistent with the forward-looking statements contained in this report, they may not be predictive of results or developments in future periods.

Any forward-looking statements that we make in this report speak only as of the date of this report. Except as required by law, we are under no duty to update or revise any of the forward-looking statements, whether as a result of new information, future events or otherwise, after the date of this report.

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PART I

ITEM 1. BUSINESS

Overview

We are a clinical-stage pharmaceutical company focused on the discovery, development and commercialization of first-in-class therapies for the treatment of patients with glaucoma and other diseases of the eye. Our strategy is to advance our product candidates, including triple-action Rhopressa™ and quadruple-action Roclatan™, to regulatory approval, and commercialize these products ourselves in North American markets and possibly Europe. We plan to build a commercial team of approximately 100 sales representatives to target approximately 10,000 high prescribing eye-care professionals throughout North America. For certain key markets outside North America, including Japan, emerging markets and possibly Europe, we intend to explore partnership opportunities through collaboration and licensing arrangements. We plan to further maximize our commercial potential by identifying and advancing additional product candidates, both through our internal discovery efforts and through possible in-licensing or acquisitions of additional ophthalmic products or product candidates that would complement our current product portfolio. We completed our IPO in October 2013 and raised net proceeds of approximately $68.3 million. In September 2014, we raised additional net proceeds of approximately $124.1 million through the sale and issuance of privately placed senior secured convertible notes.

Our senior leadership team has extensive experience in the ophthalmology market and has overseen the development and commercialization at major pharmaceutical companies of several successful ophthalmic products. If our products are approved and we are commercially successful, we believe Aerie could become a market-leading ophthalmic pharmaceutical company.

Our lead product candidate, once-daily, triple-action Rhopressa™, successfully completed a Phase 2b clinical trial in patients with open-angle glaucoma and ocular hypertension in May 2013. Phase 3 registration trials commenced in July 2014. Our Phase 3 registration trial (“Rocket 1”) and a second Phase 3 registration trial (“Rocket 2”) will measure efficacy over three months. The primary efficacy endpoint of the trials is to demonstrate non-inferiority of Rhopressa™ compared to timolol for the lowering of IOP. Timolol is the most widely used comparator in registration trials for lowering of intraocular pressure, or IOP. Rocket 2 is also designed to assess safety over 12 months. In addition, we are conducting a one year, safety-only study in Canada, named “Rocket 3.” Pending successful advancement of the Phase 3 registration trials, three-month efficacy results are expected in the middle of the second quarter 2015 for Rocket 1 and in mid-2015 for Rocket 2.

We are developing Rhopressa™ as the first of a new class of compounds that is designed to lower IOP in patients through novel mechanisms of action, or MOAs. We believe that, if approved, Rhopressa™ will represent the first new MOAs for lowering IOP in patients with glaucoma in over 20 years. Based on clinical data to date, we expect Rhopressa™ to compete within the prostaglandin analogue, or PGA, market segment due to its equivalent or potentially better efficacy for patients with IOP of 26 millimeters of mercury, or mmHg, or below at the time of diagnosis, which we refer to as “low to moderately elevated” IOP, while also targeting the diseased tissue responsible for elevated IOP. Approximately 80% of glaucoma patients have low to moderately elevated IOP at the time of diagnosis. Furthermore, if approved, we expect Rhopressa™ to compete against non-PGA products as a preferred add-on therapy to PGAs, due to its strong and consistent IOP-lowering effect with once-daily dosing relative to currently marketed non-PGA products. In addition, we expect Rhopressa™ to become a preferred therapy where PGAs are contraindicated, for patients who do not respond to PGAs, for patients who have IOPs below 21 mmHg but nevertheless present with glaucomatous damage to the optic nerve, which is commonly referred to as “low-tension” glaucoma, as well as for patients who choose to avoid the cosmetic issues associated with PGAs.

Our second product candidate, once-daily, quadruple-action Roclatan™, is a single drop fixed-dose combination of Rhopressa™ and latanoprost, the most commonly prescribed drug for the treatment of patients with glaucoma. Roclatan™ successfully completed a Phase 2b clinical trial in patients with open-angle glaucoma and ocular hypertension in June 2014 and achieved its primary efficacy endpoint on day 29 and statistical superiority over individual components at all timepoints. We believe Roclatan™ has the potential to provide a greater IOP-lowering effect than any currently

approved glaucoma product. Therefore, we believe Roclatan™ could compete with both PGA and non-PGA therapies and become the product of choice for patients requiring maximal IOP lowering. We expect Phase 3 registration trials to commence in mid-2015. Preparatory steps for such trials are well underway.

Our mission is to build a major ophthalmic pharmaceutical company. In addition to our primary product candidates, Rhopressa™ and Roclatan™, we are also exploring the longer-term impact of Rhopressa™ and Roclatan™ on the diseased trabecular meshwork, as well as potential neuroprotective benefits, and evaluating possible uses of our existing proprietary portfolio of Rho Kinase inhibitors beyond glaucoma. We recently issued a research update on preclinical results demonstrating the potential for Rhopressa™ to have disease-modifying activity in glaucoma by stopping fibrosis in the trabecular meshwork,

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and also increasing perfusion in the trabecular outflow pathway thus increasing the delivery of nutrients to the diseased tissue. Additionally, an early-stage molecule, AR-13154, has shown the preclinical potential to decrease lesions in wet age-related macular degeneration at numerically higher levels than current market leading products. Our strategy includes developing our business outside of North America, including potentially obtaining clinical approval on our own for our lead compounds in Europe and possibly Japan. Regarding commercialization strategy, if our products are successful, we may potentially commercialize ourselves or with a partner in Europe, and potentially with a partner in Japan. As we prepare for foreign-based activities, we are evaluating optimized supply chain configurations and domicile alternatives for our non-U.S. intellectual property.

We may license, acquire or develop additional product candidates to broaden our presence in ophthalmology. We are continuing to explore collaboration opportunities for new ophthalmic products, delivery alternatives and new therapeutic areas, including gene therapy. However, we have no present plans, agreements or commitments with respect to any potential acquisition, investment or license related to any such additional product candidates.

Glaucoma is one of the largest segments in the global ophthalmic market. In 2013, branded and generic glaucoma product sales exceeded $4.5 billion in the United States, Europe and Japan in aggregate, according to IMS. Prescription volume for glaucoma products in the United States alone exceeded 31 million in 2013 and is expected to grow, driven in large part by the aging population. The PGA and non-PGA market segments each represent approximately half of the prescription volume in the glaucoma market, as shown in the following pie chart, which is based on IMS data.

According to the National Eye Institute, it is estimated that over 2.7 million people in the United States suffer from glaucoma, a number that is expected to reach 4.3 million by 2030. Furthermore, The Eye Diseases Prevalence Research Group has estimated that only half of the nation’s glaucoma sufferers know that they have the disease. Glaucoma is a progressive and highly individualized disease, in which elevated levels of IOP are associated with damage to the optic nerve, resulting in irreversible vision loss and potentially blindness. Patients may suffer the adverse effects of glaucoma across a wide range of IOP levels, including within the “normotensive” range of 10 to 21 millimeters of mercury, or mmHg, which is generally accepted as the level of IOP in healthy individuals. There are multiple factors that can contribute to an individual getting glaucoma, including age, family history and ethnicity. For example, there generally is a higher incidence and severity of the disease in African-American and Hispanic populations. Based on data from the Baltimore Eye Survey, approximately 80% of glaucoma patients have low to moderately elevated IOP at the time of diagnosis and approximately 60% of glaucoma patients have IOP of 21 mmHg or below at the time of diagnosis. Additionally, in Japan, the Tajimi Study found that approximately 90% of glaucoma patients had IOP of 21 mmHg or below at the time of diagnosis. In clinical trials to date, Rhopressa™ has demonstrated the ability to provide consistent IOP lowering across all tested baseline IOP levels, which we believe differentiates it from currently marketed drugs that have shown reduced efficacy at lower baseline IOPs.

Glaucoma is treated by the reduction of IOP, which has been shown to slow the progression of vision loss. In a healthy eye, fluid is continuously produced and drained in order to maintain pressure equilibrium and provide nutrients to the eye tissue. The FDA recognizes sustained lowering of IOP as the primary clinical endpoint for the approval of drugs to treat patients with

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glaucoma and ocular hypertension. The primary drainage mechanism of the eye is the trabecular meshwork, or TM, which accounts for approximately 80% of fluid drainage, while the secondary drainage mechanism, the uveoscleral pathway, is responsible for the remaining drainage. In glaucoma patients, damage to the TM results in insufficient drainage of fluid from the eye, which causes increased IOP and damage to the optic nerve. In addition to eye fluid production and drainage through the TM and uveoscleral pathway, episcleral venous pressure, or EVP, makes a significant contribution to IOP. EVP represents the pressure of the blood in the episcleral veins of the eye where the eye fluid drains into the bloodstream. Historical studies have shown that EVP accounts for approximately half of IOP in normotensive subjects and approximately one-third of IOP in patients with pressures of 24 to 30 mmHg. When EVP is lowered, fluid is able to flow more freely from the eye. Drugs that lower IOP without lowering EVP are most effective at high IOPs, where EVP is believed to contribute less to IOP, and are less effective at lower IOPs, where EVP is seen to account for a larger portion of IOP.

Once glaucoma develops, it is a chronic condition that requires life-long treatment. The initial treatment for glaucoma patients is typically the use of prescription eye drops. PGAs have become the most widely prescribed glaucoma drug class. The most frequently prescribed PGA is once-daily latanoprost. The most commonly prescribed non-PGA drugs belong to the beta blocker class. The most frequently prescribed beta blocker is twice-daily timolol. Other non-PGA drug classes include the alpha agonists and carbonic anhydrase inhibitors. When PGA monotherapy is insufficient to control IOP or contraindicated due to concerns about side effects, non-PGA products are used either as add-on therapy to the PGA or as an alternative monotherapy. It is estimated that up to 50% of glaucoma patients receiving PGA monotherapy require add-on therapy within two years of initial prescription of the drug, in order to maintain adequate control of IOP.

Our product candidates represent a new class of drugs utilizing novel MOAs that are applied topically as once-daily eye drops. Currently approved drugs mainly reduce IOP by increasing fluid outflow through the eye's secondary drain with once-daily dosing or reducing fluid inflow by decreasing fluid production with multiple doses per day. Rhopressa™ lowers IOP through a triple MOA that (i) relaxes the contracted tissue of the TM to improve fluid outflow through the eye's primary drain, (ii) decreases fluid production in the eye and (iii) lowers EVP, an MOA that we believe further differentiates Rhopressa™ from currently marketed glaucoma products. Roclatan™, our quadruple-action fixed-combination product candidate, combines the triple MOA of Rhopressa™ with latanoprost, a PGA that increases fluid drainage through the uveoscleral pathway.

We believe there are significant unmet needs in the glaucoma market and that eye-care professionals are eager for new therapy choices. None of the commonly prescribed PGAs or non-PGAs target the TM, the diseased tissue responsible for elevated IOP in glaucoma and the eye's primary drain. Moreover, PGAs have side effects, contraindications and reduced efficacy in patients with low to moderately elevated IOPs relative to patients with higher IOPs. Non-PGAs are less efficacious than PGAs, have more serious and a greater number of side effects and contraindications, and require multiple daily dosings. As a result, we believe there is a significant unmet need in both the PGA and non-PGA market segments, each of which represents approximately half of the U.S. and European glaucoma market based on prescription volumes. Despite the limitations of existing glaucoma drugs, Xalatan (latanoprost), the best-selling PGA, together with Xalacom, its fixed-combination with a beta blocker, which is not available in the United States, generated peak annual global revenues of approximately $1.7 billion prior to the introduction of its generic equivalents, and the most commonly prescribed non-PGA drugs each generated peak annual global revenues of over $400 million prior to the introduction of their generic equivalents.

We believe Rhopressa™ may be prescribed by eye-care professionals as an initial therapy for patients with low to moderately elevated baseline IOPs of 26 mmHg or below at the time of diagnosis, representing approximately 80% of glaucoma patients. At these IOP levels, we believe the amount of IOP reduction achieved by Rhopressa™ would be equal to or exceed that of all currently marketed PGA and non-PGA products.

In addition to the expected primary use of Rhopressa™ as an initial therapy for patients with low to moderately elevated baseline IOPs described above, we also believe Rhopressa™ may be prescribed by eye-care professionals in the following circumstances:

•

As an add-on drug of choice for patients taking PGAs, due to the MOAs of Rhopressa™ being complementary to the MOA of PGAs, and due to the strong efficacy, more convenient dosing and better tolerability profile of Rhopressa™ compared to currently marketed non-PGA add-on products. It is estimated that up to 50% of glaucoma patients receiving PGA monotherapy require add-on therapy within two years of initial prescription of the PGA in order to maintain control of IOP.

- As a preferred alternative therapy for patients who do not respond to PGAs.
- As a preferred initial therapy for patients with low-tension glaucoma.

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- As a preferred initial therapy where PGAs are contraindicated and for patients who choose to avoid the cosmetic issues associated with PGAs, including iris color change in light-eyed patients, discoloration of tissue surrounding the eyes and eyelid droopiness and sunken eyes caused by loss of orbital fat.

In addition, based on our preclinical data to date, we believe that quadruple-action Roclatan™ would be the only glaucoma product that covers the full spectrum of currently known IOP-lowering MOAs, giving it the potential to provide a greater IOP-lowering effect than any currently approved glaucoma product. Therefore, we believe Roclatan™ could compete with both PGA and non-PGA therapies for patients requiring maximal IOP lowering, including those with IOPs above 26 mmHg and those who present with significant disease progression despite currently available therapies.

We own the worldwide rights to all indications for our current product candidates. We currently plan to commercialize our products ourselves in North America and possibly Europe and explore partnership opportunities through collaboration and licensing arrangements in certain key markets outside of North America, including Japan, emerging markets and possibly Europe. In Japan specifically, the Tajimi study found that 90% of glaucoma patients had IOP of 21 mmHg or below at the time of diagnosis. We believe this creates a significant market opportunity in Japan for Rhopressa™ due to its ability to reduce IOP at consistent levels across all tested baseline IOPs, as demonstrated in our Phase 2b clinical trial, which we believe differentiates it from currently marketed drugs that have shown reduced efficacy at lower baseline IOPs.

Our intellectual property portfolio contains patents and pending patent applications related to composition of matter, pharmaceutical compositions and methods of use for our product candidates. We have patent protection for our primary product candidates, Rhopressa™ and Roclatan™, in the United States through at least 2030.

Our Product Pipeline

Our primary product candidates, triple-action Rhopressa™ and quadruple-action Roclatan™, are once-daily eye drops. Rhopressa™ inhibits Rho Kinase, or ROCK, and the norepinephrine transporter, or NET, which are both novel biochemical targets for lowering IOP. By inhibiting these targets, we believe Rhopressa™ reduces IOP via three separate MOAs: (i) through ROCK inhibition, it increases fluid outflow through the TM, which accounts for approximately 80% of fluid drainage from the eye; (ii) also through ROCK inhibition, as demonstrated in a preclinical study, it reduces EVP, which represents the pressure of the blood in the episcleral veins of the eye where eye fluid drains into the bloodstream; and (iii) through NET inhibition, it reduces the production of eye fluid. Roclatan™, a single-drop fixed-dose combination of Rhopressa™ and latanoprost, lowers IOP through the same three MOAs as Rhopressa™ and, as a fourth MOA, through the ability of latanoprost to increase fluid outflow through the uveoscleral pathway, the eye's secondary drain.

We discovered and developed our product candidates internally through a rational drug design approach that coupled medicinal chemistry with high content screening of compounds in proprietary cell-based assays. We selected and formulated our product candidates for preclinical in vivo testing following a detailed characterization of over 1,500 synthesized ROCK-selective and ROCK/NET inhibitors. We continue to seek to discover and develop new compounds in our research laboratories and employ a scientific staff with expertise in medicinal chemistry, analytical chemistry, biochemistry, cell biology, pharmacology and pharmaceutical science.

The following table summarizes each of our existing product candidates, their MOAs and their development status, as well as our intellectual property rights for these product candidates.

Product Candidate and Mechanism		Phase of Development	Intellectual Property Rights
Rhopressa™	Triple-action—ROCK/NET inhibitor	Phase 3	Wholly-Owned
Roclatan™	Quadruple-action—ROCK/NET inhibitor and latanoprost, a PGA	Phase 3	Wholly-Owned

AR-13533	Second-generation ROCK/NET inhibitor	Preclinical	Wholly-Owned

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Triple-Action Rhopressa™

Rhopressa™ is the first of a new class of glaucoma drug products that was discovered by our scientists. It is a once-daily eye drop designed to reduce IOP in patients with glaucoma or ocular hypertension. It increases fluid outflow through the primary drain of the eye while also reducing eye fluid production. In addition, a preclinical study demonstrated reduction of EVP as an additional MOA of Rhopressa™, as further described below. The active ingredient in Rhopressa™, AR-13324, acts through the inhibition of both ROCK and NET.

ROCK is a protein kinase, which is an enzyme that modifies other proteins by chemically adding phosphate groups to them. Specifically, ROCK regulates actin and myosin, which are proteins that are responsible for cellular contraction. ROCK activity also promotes the production of extracellular matrix proteins. ROCK inhibitors block TM cell contraction and reduce the production of extracellular matrix, thereby improving fluid outflow and consequently decreasing IOP. In addition, we believe ROCK inhibition may also be responsible for reduction of EVP. EVP represents the pressure of the blood in the episcleral veins of the eye, where eye fluid drains into the bloodstream. When EVP is lowered, the fluid is able to flow more freely from the eye.

NET is a protein that transports norepinephrine across neuronal cell membranes. Norepinephrine is a chemical released by neurons to communicate with targeted cells. NET returns excess norepinephrine back into the neuron, which helps end the signaling between the neuron and the neuron's target cells. We believe the inhibition of NET prolongs the activation of target cells in the ciliary body of the eye, which reduces the production of eye fluid and thereby lowers IOP.

In addition to its triple MOA, Rhopressa™ has a number of characteristics that distinguish it from our previously developed product candidates, including ROCK-selective drug AR-12286 and its fixed-dose combination product PG286, and other clinical-stage ROCK inhibitors, which together we refer to as "comparator ROCK inhibitors." The active ingredient in Rhopressa™, AR-13324, has a unique chemical composition that was specifically designed to allow maximal efficacy of the drug in the eye. Enzymatic conversion of AR-13324 produces two separate molecules, one of which is approximately ten to 160 times more potent at inhibiting ROCK than comparator ROCK inhibitors. This contributes to greater efficacy and longer duration of effect of AR-13324 relative to comparator ROCK inhibitors that we observed in preclinical models. In addition, AR-13324 has inhibitory activity against a secondary kinase target, Protein Kinase C, or PKC, which is known to act in parallel with ROCK to promote cell contraction. Compounds that inhibit ROCK without inhibiting PKC may allow PKC activity to increase in TM cells over time, resulting in a loss of IOP-lowering efficacy. We believe the ability of AR-13324 to inhibit both the primary, ROCK, and secondary, PKC, signaling pathways that lead to TM cell contraction contributes to the ability of Rhopressa™ to maintain its efficacy over time.

Rhopressa™ is expected to compete against all products in the glaucoma market, the significant majority of which have been in the market for over 20 years. The PGA and non-PGA market segments each represent approximately half of the U.S. and European glaucoma market based on prescription volumes. Despite the limitations of existing glaucoma drugs, Xalatan (latanoprost), the best-selling PGA, together with Xalacom, its fixed-combination with a beta blocker, which is not available in the United States, generated peak annual global revenues of approximately $1.7 billion prior to the introduction of its generic equivalents, and the most commonly prescribed non-PGA drugs each generated peak annual global revenues of over $400 million prior to the introduction of their generic equivalents. We believe there is a significant unmet need across the glaucoma market due to many drugs requiring multiple daily dosings, side effects and contraindications of other products, and the fact that none of the commonly prescribed drugs target the diseased TM tissue.

We believe that triple-action Rhopressa™ has several significant differentiating characteristics that would make it a strong competitor in both the PGA and non-PGA market segments, if approved, including:

- Strong IOP-Lowering Effect-In our Phase 2b clinical trial, once-daily Rhopressa™ demonstrated mean IOP reductions of 5.7 and 6.2 mmHg on days 28 and 14, respectively. Studies have shown that a sustained 5 mmHg reduction in IOP reduces risk of disease progression by approximately 50%. In the Roclatan™ Phase 2b trial completed in June 2014, Rhopressa™ performed with similar results as it had in its Phase 2b trial completed in June 2013. Therefore, we believe

the level of IOP reduction achieved by Rhopressa™ would be equal to or exceed that of all currently marketed non-PGA products and, in addition, for patients with low to moderately elevated IOPs at the time of diagnosis, representing approximately 80% of glaucoma patients, would be equal to or potentially exceed that of all currently marketed PGA products.

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- Consistent IOP-Lowering Effect Across Various Baseline IOPs-Published studies have indicated that currently marketed PGA and non-PGA products do not lower IOP as effectively in patients with low to moderately elevated baseline IOPs relative to patients with higher baseline IOPs. In our Phase 2b clinical trial, Rhopressa™ demonstrated a differentiated ability to reduce IOP at consistent levels across all baseline IOPs tested in the trial. The results of a preclinical in vivo study sponsored by Aerie and reported in February 2014 suggest that this differentiated effect may be attributable to the ability of Rhopressa™ to lower EVP.

- Novel Triple-Action MOA-We believe Rhopressa™ works through three MOAs: increasing outflow through the TM, decreasing fluid production in the eye and reducing EVP. If approved, we believe Rhopressa™ would be the only once-daily drug available that works through these three MOAs. In addition, we believe the three MOAs of Rhopressa™ are highly complementary to the MOA of market-leading PGAs, which increase fluid outflow through the uveoscleral pathway.

- Once-Daily Dosing Advantage-The most commonly prescribed non-PGA drugs are dosed two to three times daily, which places a considerable daily burden on patients, who are generally required to use these drugs for the remainder of their lives. Rhopressa™ is being developed as a once-daily dosed glaucoma therapy. This more convenient dosing regimen is expected to result in higher patient compliance, which may lead to improved outcomes.

- Favorable Tolerability Profile-Currently marketed glaucoma drugs have several tolerability issues indicated on their product labels, including ocular allergic reaction, itching of the eye, iris color change, orbital tissue discoloration, unusual taste and hyperemia. In our Phase 2a and Phase 2b clinical trials for Rhopressa™, a total of 209 patients were exposed to Rhopressa™. The main tolerability finding for Rhopressa™ was transient, or temporary, hyperemia, which is a cosmetic asymptomatic redness of the eye. Most of the hyperemia was scored as “mild” as evaluated by the eye-care professionals in the morning following instillation of the drop the previous night. Hyperemia is a common tolerability finding also associated with PGAs. In the Roclatan™ Phase 2b trial completed in June 2014, Rhopressa™ tolerability findings were similar to those of the Phase 2b trial completed in June 2013.

- Lack of Systemic Side Effects-Rhopressa™ has demonstrated a lack of systemic side effects in clinical trials to date, including our Phase 1 pharmacokinetic, or PK, study, the results of which were reported in January 2014. Currently marketed non-PGA drugs have systemic side effect issues indicated on their product labels, including among others, lethargy, reduced heart rate, Stevens Johnson syndrome and blood dyscrasias. Furthermore, the most widely prescribed non-PGA drug, timolol, has contraindications that include bronchospasm, arrhythmia and heart failure. In addition, Rhopressa™ targets the TM, the diseased tissue responsible for elevated IOP in glaucoma and the eye’s primary drain, whereas commonly prescribed PGAs and non-PGAs target the secondary drain and the fluid production in the eye, respectively.

Based on the Rhopressa™ Phase 2b clinical trial results, performance of Rhopressa™ in the Roclatan™ Phase 2b clinical trial and the several positive differentiating attributes of Rhopressa™, we believe Rhopressa™ has the potential to be a strong competitor across the glaucoma market. Our Phase 3 registration trials commenced in July 2014 and are designed to use timolol as the comparator, as timolol represents the most widely used comparator in registration trials in glaucoma, and is also the most widely prescribed non-PGA drug.

Rhopressa™ Phase 2b Efficacy Results

In May 2013, we completed a 28-day Rhopressa™ Phase 2b clinical trial. This trial included 221 patients who were treated once daily with Rhopressa™ 0.01%, Rhopressa™ 0.02% or latanoprost. Latanoprost was used as the comparator because it is the most widely prescribed drug of all currently marketed glaucoma products. The primary efficacy endpoint for this Phase 2b clinical trial was mean diurnal IOP across subjects within each treatment group on day 28. We observed statistically significant decreases in mean diurnal IOP in all treatment groups on day 28 as compared to unmedicated baseline.

Baseline IOP was measured prior to treatment. Following treatment, IOP was measured on day seven at 8 a.m. and on days 14 and 28 at 8 a.m., 10 a.m. and 4 p.m. On day 14, mean diurnal IOP (which refers to the average of mean IOPs measured at 8 a.m., 10 a.m. and 4 p.m.) decreased to 19.5 and 18.4 mmHg in the Rhopressa™ 0.02% and latanoprost groups, respectively,

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representing a decrease from unmedicated baseline of 6.2 and 7.1 mmHg. On day 28, mean diurnal IOP was 20.0 and 18.7 mmHg, respectively, representing a decrease from unmedicated baseline of 5.7 and 6.8 mmHg. These decreases from unmedicated baseline were statistically significant with p-values < 0.001. P-value, or probability value, is a statistical measure that helps scientists determine if their hypotheses are correct. It is directly related to the statistical significance level of the results, which is an important component in determining whether the data obtained from scientific research support the hypothesis being tested.

The statistical significance level is determined by the researcher and is customarily set at 0.05, or 5%. Essentially, this means that 5% of the time, the results in the study would be derived by complete chance, but 95% of the time, the variable in the study would be directly related to the results of the study. Efficacy from the Phase 2b clinical trial are described further below.

Efficacy Results of the 28-day Phase 2b Clinical Trial Comparing Rhopressa™ 0.02% to Latanoprost
Showing Mean Diurnal IOP for Days 14 and 28 Compared to Baseline

Rhopressa™ maintained consistent efficacy from day seven to day 28. For Rhopressa™ 0.02%, the concentration being used in our Phase 3 trials, at the 8 a.m. time point, the time of highest baseline IOP, the IOP reductions achieved on day seven and day 28 were 6.0 and 5.9 mmHg, respectively. The level of IOP reduction achieved by Rhopressa™ 0.02% in our Phase 2b study was clinically significant, since previously published long-term studies have demonstrated that a sustained 5 mmHg reduction in IOP reduces the risk of disease progression by approximately 50%.

“Clinical significance” means that the effect is large enough to be important to patients and physicians. An effect that is statistically significant may or may not also be clinically significant. In glaucoma, the Early Manifest Glaucoma Trial, a large long-term study evaluating the effect of IOP lowering in patients with glaucoma, concluded that each 1 mmHg reduction in IOP lowered the risk of progression of optic nerve damage by 10%, indicating that each 1 mmHg reduction in IOP provides a meaningful level of protection to the patient.

IOP-Lowering Effect of Rhopressa™ 0.02% at 8 a.m. on Days 7, 14 and 28

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In the full Phase 2b trial population, which consisted of patients with unmedicated baseline IOPs ranging from 22 to 36 mmHg, the IOP-lowering effect of our once-daily Rhopressa™ 0.02% was 1.2 mmHg less than that of latanoprost on day 28 and did not show non-inferiority. However, Rhopressa™ 0.02% efficacy relative to latanoprost was in line with published historical data for twice-daily timolol relative to latanoprost. Timolol is the most commonly prescribed non-PGA drug and the comparator for our Phase 3 non-inferiority registration trials.

A study by Hedman and Alm, which reports on the pooled data from three registration trials of latanoprost versus timolol, showed the IOP-lowering effect of timolol to be 1.2 mmHg less than that of latanoprost, as reflected in the graph on the following page under the heading "Comparison of Latanoprost and Timolol from Pooled Data of Three Registration Trials." Our Rhopressa™ Phase 2b clinical trials similarly showed Rhopressa to have an IOP-lowering effect of 1.2 mmHg less than that of latanoprost.

An additional protocol-specified analysis that compared the results for the patients who entered the trial with moderately elevated baseline IOPs (22 to 26 mmHg) to patients with highly elevated baseline IOPs (greater than 26 mmHg) revealed a differentiated efficacy profile of Rhopressa™ compared to latanoprost. Consistent with previous scientific literature, latanoprost produced smaller IOP reductions in patients with moderately elevated IOPs than in patients with highly elevated IOPs. In contrast, Rhopressa™ maintained essentially the same IOP-lowering effect in patients with moderately elevated IOPs as in patients with highly elevated IOPs ($p>0.30$). As a result, the IOP-lowering effect of Rhopressa™ was equivalent to latanoprost in patients with moderately elevated baseline IOPs and Rhopressa™ thereby demonstrated statistical non-inferiority to latanoprost in this sub-group. A non-inferiority trial is a type of clinical trial performed to see if a new drug or treatment is "not inferior" to a current active treatment or to determine if a new treatment is "at least as good as," or "not unacceptably worse than," the active comparator treatment. A non-inferiority trial aims at demonstrating that the test product is not worse than the comparator by more than a small pre-specified amount. This amount is known as the non-inferiority margin, which for the Rhopressa™ Phase 2b trial was 1.5 mmHg.

IOP-Lowering Effect of Rhopressa™ 0.02% and Latanoprost in the Full Patient Population
Compared to the Subgroup with Moderately Elevated IOP*

* Based on diurnal measurements.

A study published in 2000, which pooled data from three latanoprost registration trials, demonstrated that both latanoprost and timolol lose approximately 0.5 mmHg in efficacy for every 1 mmHg lower baseline IOP, as illustrated in the chart below. Additional publications have indicated similar declining efficacy results for other currently marketed non-PGA glaucoma drugs, including the alpha agonist brimonidine and the carbonic anhydrase inhibitor dorzolamide.

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Comparison of Latanoprost and Timolol from Pooled Data of Three Registration Trials

Source: Hedman and Alm (Eur J Ophthalmol 2000; 10:95-104)

We believe the ability of Rhopressa™ to maintain a consistent IOP-lowering effect on baseline IOP will place Rhopressa™ in a favorable competitive position relative to current PGA and non-PGA products because a significant majority of glaucoma patients have baseline IOPs of 26 mmHg or below at the time of diagnosis. Results from a large epidemiological survey published in 1991, the Baltimore Eye Survey, demonstrated that greater than 78% of patients have unmedicated baseline IOPs of 26 mmHg or below when first diagnosed with glaucoma.

Prevalence of Glaucoma by Baseline IOP at the Time of Diagnosis

Adapted from Baltimore Eye Survey in which 10,444 subjects were screened for the prevalence of Open-Angle Glaucoma (OAG)

Furthermore, in the Tajimi Study carried out in Japan in 2000 and 2001, 92% of patients with primary open-angle glaucoma were found to have IOPs of 21 mmHg or less at the time of diagnosis. In this study, 3,870 randomly selected residents of the city of Tajimi were screened for primary open-angle glaucoma.

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Rhopressa™ Phase 2a Efficacy Results

In August 2012, we completed a 7-day Rhopressa™ Phase 2a clinical trial. This trial included 85 patients who were treated once-daily with Rhopressa™ 0.01%, Rhopressa™ 0.02%, Rhopressa™ 0.04% or the vehicle of Rhopressa™. "Vehicle" refers to the formulation without the active ingredient. Baseline IOP was measured prior to treatment. IOP was measured following seven days of dosing at 8 a.m., 10 a.m., 12 p.m. and 4 p.m. The primary efficacy endpoint for this Phase 2a clinical trial was the mean diurnal IOP (which refers to the average of mean IOPs measured at 8 a.m., 10 a.m., 12 p.m. and 4 p.m.) across subjects within each treatment group on day eight. We observed statistically significant decreases in mean diurnal IOP in all Rhopressa™ treatment groups following seven days of dosing compared to unmedicated baseline. Additionally, each concentration of Rhopressa™ was shown to be statistically superior to the vehicle following seven days of dosing with p-values ranging from 0.018 to <0.001.

Rhopressa™ Phase 2 Safety Data

In our 7-day Phase 2a and 28-day Phase 2b clinical trials for Rhopressa™ and Roclatan™ a total of 287 patients were exposed to Rhopressa™. In these trials, Rhopressa™ was well tolerated. The main adverse event was transient hyperemia, or asymptomatic redness of the eye, with all hyperemia scored as mild or moderate. This cosmetic tolerability finding is based on the MOA of the drug, which induces a transient dilation of small blood vessels located over the sclera, or white part of the eye.

The biomicroscopy findings for the vast majority of patients who experienced ocular hyperemia in the Rhopressa™ Phase 2b trial were mild and transient, and there were no observations of severe ocular hyperemia. Biomicroscopy refers to the observation by a masked examiner of the anterior part of the eye. On day 28 at 8 a.m., mild and moderate conjunctival hyperemia was observed in 18% and 24% of patients in the Rhopressa™ 0.01% and 0.02% treatment groups, respectively, and in 11% of patients in the latanoprost group. The incidence of conjunctival hyperemia decreased throughout the study for Rhopressa™ and increased for latanoprost.

Published data indicate that latanoprost generates the lowest rate of hyperemia among the commonly prescribed PGAs. In a study that compared the relative frequency of hyperemia for bimatoprost, travaprost and latanoprost after 12 weeks of treatment, the largest proportion of patients reporting redness was found in the bimatoprost group with 35%, followed by the travoprost and latanoprost groups with 27% and 16%, respectively.

Rhopressa™ Comparison to AR-12286

We have analyzed our clinical and preclinical data for Rhopressa™, the lead candidate from our ROCK/NET inhibitor class, relative to our clinical and preclinical data for AR-12286, our ROCK-selective compound that we were previously evaluating for further clinical development in addition to Rhopressa™. We conducted similarly designed 28-day Phase 2 clinical trials for each of Rhopressa™ and AR-12286, the comparative results of which are presented in the chart below. Rhopressa™ 0.02% maintained stable efficacy on day 28 relative to day seven in its 28-day Phase 2 clinical trial. In contrast, AR-12286 0.5% lost 1.4 mmHg of IOP-lowering efficacy from day seven to day 28 in its 28-day Phase 2 clinical trial.

IOP-Lowering Effect of Rhopressa™ and AR-12286
at 8 a.m. on Days 7, 14 and 28

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We subsequently completed a three-month Phase 2 clinical trial for AR-12286, for which data were available in June 2013. This trial confirmed the trend observed in the 28-day trial discussed above. In the three-month trial, the efficacy of AR-12286 continued to decline over the trial period such that it failed to meet its primary efficacy endpoint, non-inferiority to timolol.

Our lead product candidate, Rhopressa™, has a number of characteristics that distinguish it from AR-12286. Rhopressa™ lowers IOP by inhibiting both ROCK and NET, whereas AR-12286 inhibits only ROCK. In addition, the active ingredient in Rhopressa™, AR-13324, has a unique chemical composition that was specifically designed to allow maximal efficacy of the drug in the eye. Enzymatic conversion of AR-13324 produces two separate molecules, one of which is approximately ten times more potent at inhibiting ROCK than AR-12286. The more potent ROCK inhibition provided by Rhopressa™, as well as its ability to inhibit NET, contributes to its greater efficacy and longer duration of effect relative to AR-12286.

In addition, the analyses of our data suggest that there is a secondary signaling pathway that is activated by a protein called PKC that also leads to contraction of the TM. Our preclinical analyses show that AR-13324 is a potent inhibitor of both ROCK and PKC, whereas AR-12286 is a potent inhibitor of ROCK but not of PKC. We believe that the ability of AR-13324 to inhibit both the primary, ROCK, and the secondary, PKC, signaling pathways that lead to TM cell contraction contributes to the ability of Rhopressa™ to maintain its efficacy over time.

The chart below shows the duration of effect of Rhopressa™ 0.02% from our 28-day Phase 2b clinical trials for Rhopressa™ and Roclatan™ as compared with latanoprost, which we believe has a longer duration of effect than AR-12286. In both the Phase 2b clinical trials for Rhopressa™ and Roclatan™, Rhopressa™ 0.02% had superior duration 36 hours after last dosing relative to latanoprost.

Furthermore, in a six-month toxicology study with exaggerated dosing of AR-12286, lens opacities, otherwise known as cataracts, were observed in rabbit eyes beginning at three months. In a similar six-month toxicology study with exaggerated dosing of Rhopressa™, no adverse lens effects were observed.

As a result of these observations, in June 2013, we selected Rhopressa™ for advancement to Phase 3 clinical development and discontinued development of AR-12286 and its related fixed-dose combination product PG286.

Rhopressa™ Phase 1 Pharmacokinetic Study Results

In January 2014, we reported top-line results from our Phase 1 PK study, in which Rhopressa™ eye drops were administered once daily to 18 healthy individuals over an eight-day period to assess systemic exposure to the drug. In addition, the drug's effect on IOP was measured. All study subjects had normotensive IOPs in the range of 12 to 21 mmHg, with an average diurnal IOP for the group of approximately 16 mmHg prior to dosing. The PK study demonstrated very low systemic exposure to Rhopressa™, with blood levels at or below the limit of detection of 0.1 ng/mL at all time points, and no drug-related effects on systemic safety parameters such as blood pressure and heart rate. Of particular importance to the product's efficacy profile, the subjects' average diurnal IOP decreased by approximately 5 mmHg, or more than 30%, to approximately 11 mmHg after the eight days of dosing. We believe this large IOP reduction in normotensive subjects was due to the EVP-lowering effect of Rhopressa™, which has been subsequently supported by a preclinical in vivo study described below.

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Rhopressa™ Preclinical in Vivo Study Results

We believe that the strong IOP-lowering effect of Rhopressa™ at lower baseline IOPs, and its consistent IOP-lowering effect across all tested baseline IOPs, are due in part to the ability of Rhopressa™ to lower EVP, which accounts for approximately half of IOP in normotensive individuals. This is an MOA that we believe further differentiates Rhopressa™ from currently marketed PGA and non-PGA products. The EVP-lowering effect of Rhopressa™ was demonstrated in a preclinical in vivo rabbit study sponsored by Aerie, the results of which we reported in February 2014. In this study, Rhopressa™ demonstrated statistically significant reductions in EVP and IOP following the third daily dose. EVP decreased by 35% relative to baseline, and IOP was reduced by 39%. Based on these study results, it was estimated that up to 42% of the reduction in IOP caused by Rhopressa™ was due to the reduction in EVP.

Rhopressa™ Development Strategy

Phase 3 registration trials for Rhopressa™ commenced in July 2014. We anticipate total enrollment of approximately 1,300 patients in three Phase 3 registration trials of Rhopressa™. Phase 3 efficacy results will be determined after three months of treatment and safety results will be analyzed and submitted following 12 months of treatment. Two trials are being conducted in the United States, named “Rocket 1” and “Rocket 2,” and one safety-only study is being conducted in Canada, named “Rocket 3.”

The entry criteria for our Phase 3 trials include a minimum IOP greater than 20 mmHg and a maximum of less than 27 mmHg. Based on discussions with the FDA, we believe that the entry criteria for our Phase 3 trials will not impact the product label. The entry criteria for our Phase 2 trials were 22 to 36 mmHg. Lowering the IOP entry criteria for our Phase 3 trials increases the representation of patients with moderately elevated IOPs in the trials and thereby provides a more representative cross-section of the glaucoma patient population. The primary efficacy endpoint of the trials will be to demonstrate non-inferiority of IOP lowering for Rhopressa™ compared to timolol. Timolol is the most widely used comparator in registration trials for glaucoma and also the most widely prescribed non-PGA glaucoma drug.

Pending successful advancement of the Phase 3 registration trials, three-month efficacy results are expected in the middle of the second quarter 2015 for Rocket 1 and in mid-2015 for Rocket 2. If the results of the Phase 3 trials are positive, then we would submit a new drug application, or an NDA, by mid-2016. We intend to explore the potential for priority review with the FDA, although there can be no assurance that such priority review will be granted by the FDA.

Quadruple-Action Roclatan™

Our once-daily, quadruple-action product candidate Roclatan™ is a combination of our triple-action compound AR-13324, the active ingredient in Rhopressa™, formulated with latanoprost in a single eye drop. If approved, we believe that Roclatan™ would be the first glaucoma product to lower IOP through all currently known MOAs:

- increasing fluid outflow through the TM, the eye’s primary drain,
- reducing fluid production in the eye,
- reducing EVP, and
- through the MOA of latanoprost, increasing fluid outflow through the uveoscleral pathway, the eye’s secondary drain.

Roclatan™ Phase 2 Efficacy Results

In June 2014, we completed a 28-day Roclatan™ Phase 2b clinical trial. The baseline IOPs tested in the study ranged from 22 to 36 mmHg and included 297 patients who were treated once daily with Roclatan™ 0.01%, Roclatan™ 0.02%, Rhopressa™ 0.02%, or latanoprost. The primary efficacy endpoint for this Phase 2b clinical trial was statistical superiority of Roclatan™ over each of its components on day 29. Baseline IOP was measured prior to treatment. Following treatment, IOP was measured on day eight, 14 and 28 at 8 a.m., 10 a.m. and 4 p.m. We observed statistical superiority over the individual components at all time points.

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Roclatan™ vs. Individual Components
Mean IOP at All Time Points ($p<0.001$)

Roclatan™ 0.02% lowered mean diurnal IOP on day 29 from 25.1 mmHg at baseline to 16.5 mmHg, a 34% decrease in IOP. Roclatan™ 0.02% was determined to be 1.6 - 3.2 mmHg more efficacious than latanoprost and 1.7 - 3.4 mmHg more efficacious than Rhopressa™.
Roclatan™ Efficacy vs. Individual Components
Mean IOP at All Time Points (Intent to Treat)

* Difference between 0.02% Roclatan™ and latanoprost or Rhopressa™
An additional analysis that compared the response results for patients on day 29 revealed that 50% of Roclatan™ patients compared to 28% of latanoprost patients experienced a 35% or greater decrease in mean diurnal IOP from baseline on day 29. Furthermore, 46% of Roclatan™ patients compared to 18% of latanoprost patients had a mean diurnal IOP of 16 mmHg or less on day 29.

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We believe Roclatan™, if approved, would be the only glaucoma product that covers the full spectrum of currently known IOP-lowering MOAs, giving it the potential to provide a greater IOP-lowering effect than any currently marketed glaucoma product. Therefore, we believe Roclatan™ could compete with both PGA and non-PGA therapies for patients requiring maximal IOP lowering, including those with IOPs above 26 mmHg and those who present with significant disease progression despite currently available therapies.

Roclatan™ Phase 2 Safety Data

In our Phase 2b clinical trial, a total of 147 patients were exposed to Roclatan™. In these trials, Roclatan™ was well tolerated. The most common Roclatan™ adverse event was hyperemia, or eye redness, which was reported in 40% of patients. For patients who experienced hyperemia, 80% were observed as mild through biomicroscopy findings. Additionally, there were no systemic drug-related adverse events reported.

Roclatan™ Development Strategy

Registration trials for Roclatan™ are expected to commence in mid-2015 upon completion of our three-month Phase 3-enabling ocular toxicology study and ocular PK study. Additionally, we expect to have further discussions with the FDA and European Medicines Agency ("EMA") regarding final trial designs in the first quarter of 2015.

We currently anticipate total enrollment of approximately 1,500 patients in three Phase 3 registration trials of Roclatan™. We expect there will be two trials conducted in the United States and one trial in the European Union. As described above, we intend to meet with the FDA and EMA in the first quarter of 2015 regarding final trial designs. As such, there can be no assurance that our anticipated enrollment and trial designs described above will satisfy both the FDA and EMA and subsequent adjustments to the trial designs may be necessary.

Assuming we commence the Phase 3 trials in mid-2015 and fully enroll the trials within our anticipated timeframe, we would expect efficacy data from the trials in mid-2016 and, if the results of the Phase 3 trials are positive, that we would submit a NDA by mid-2017. We intend to explore the potential for priority review with the FDA, although there can be no assurance that such priority review will be granted by the FDA.

Second-Generation AR-13533

In addition to our primary product candidates, Rhopressa™ and Roclatan™, we are in the preclinical development stage with AR-13533, our second-generation ROCK/NET inhibitor. AR-13533 does not require enzymatic conversion in the eye to deliver maximal ROCK inhibitor activity, and therefore AR-13533 may provide additional IOP-lowering effect in patients beyond that obtained with Rhopressa™. We have not submitted an IND for AR-13533 to the FDA and there can be no assurance that an IND will be submitted.

Our Strategy

Our goal is to be a leader in the discovery, development and commercialization of innovative pharmaceutical products for the treatment of patients with glaucoma and other diseases of the eye. We believe our product candidates have the potential to address many of the unmet medical needs in the glaucoma market. Key elements of our strategy are to:

Advance the development of our product candidates to approval. Based on the results from our Phase 2b clinical trial for triple-action Rhopressa™, we proceeded into Phase 3 registration trials for this drug in July 2014. In June 2014, we successfully completed a Phase 2b clinical trial for Roclatan™, our quadruple-action combination of Rhopressa™ and latanoprost, and preparatory steps for Phase 3 registration trials have commenced. We expect Phase 3 registration trials for Roclatan™ to commence in mid-2015. In addition, over the longer term, we plan to evaluate opportunities associated with preclinical-stage AR-13533, our second-generation ROCK/NET inhibitor.

Establish internal sales capabilities to commercialize our product candidates in North America and possibly Europe. We own worldwide rights to all indications for our product candidates and we plan to retain North American and possibly European commercialization rights. Ultimately, if our product candidates are approved, we plan to build a commercial team of approximately 100 sales representatives. We expect our sales organization to target approximately 10,000 high prescribing eye-care professionals throughout North America. If our product candidates are approved in Europe for commercial sale and if we self-commercialize our product candidates in Europe, we will need to establish similar functions or outsource these functions to third parties.

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Explore partnerships with leading pharmaceutical and biotechnology companies to maximize the value of our product candidates outside North America. We currently plan to explore the licensing of commercialization rights or other forms of collaboration with qualified potential partners for the commercialization of our product candidates in other territories, including Japan and possibly Europe.

Continue to leverage and strengthen our intellectual property portfolio. We believe we have a strong intellectual property position relating to our product candidates. Our intellectual property portfolio contains patents and pending patent applications in the U.S. and certain foreign jurisdictions related to composition of matter, pharmaceutical compositions and methods of use for our product candidates. We have patent protection for our primary product candidates in the United States through at least 2030.

Expand our product portfolio through internal discovery efforts and possible in-licensing or acquisitions of additional ophthalmic product candidates or products. We continue to seek to discover and develop new compounds in our research laboratories and employ a scientific staff with expertise in medicinal chemistry, analytical chemistry, biochemistry, cell biology, pharmacology and pharmaceutical science. In addition, we also plan to evaluate the expansion of our product portfolio through in-licensing or acquisitions of additional ophthalmic product candidates or products.

Glaucoma Overview

Glaucoma is generally characterized by relatively high IOP as a result of impaired drainage of fluid, known as aqueous humor, from the eye. The FDA recognizes sustained lowering of IOP, measured in terms of mmHg, as the primary clinical endpoint for regulatory approval, making clinical trials for this indication relatively straight-forward due to easily measured objective parameters.

In a healthy eye, aqueous humor is continuously produced and drained from the eye in order to maintain pressure equilibrium and provide micronutrients to various tissues in the eye. The normal range of IOP is generally between 10 and 21 mmHg. Several studies have demonstrated that the significant majority of glaucoma patients have IOPs below 26 mmHg at the time of diagnosis. An insufficient drainage of fluid can increase IOP above normal levels, which can eventually cause damage to the optic nerve. Once damaged, the optic nerve cannot regenerate and thus, damage to vision is permanent.

The most common form of glaucoma is open-angle glaucoma, which is characterized by abnormally high IOP as a result of impaired drainage of fluid from the eye’s primary drain, the TM. Open-angle glaucoma is a progressive disease leading to vision loss and blindness for some patients as a result of irreversible damage to the optic nerve. Studies of the disease have demonstrated that reducing IOP in patients with glaucoma can help slow or halt further damage to the optic nerve and help preserve vision. Once diagnosed, glaucoma requires life-long treatment to maintain IOP at lower levels based on the individual patient’s risk of disease progression. Ophthalmologists will routinely determine a target IOP, which represents the desired IOP level to achieve with glaucoma therapy for an individual patient. Should the disease progress even once the initial target IOP is reached, further lowering of the IOP has been shown to help in preventing additional damage to the optic nerve and further vision loss. This may require lowering IOP until it is in the so-called “low normal range” of 12 to 14 mmHg to protect the optic nerve from further damage.

There are multiple factors that can contribute to an individual getting open-angle glaucoma, including age, family history and ethnicity. For example, there generally is a higher incidence and severity of the disease in African-American and Hispanic populations.

Some patients with high IOP are diagnosed with a condition known as ocular hypertension. Patients with ocular hypertension have high IOP without the loss of visual fields or observable damage to the optic nerve, and are at an increased risk of developing glaucoma. These patients are commonly treated in the same manner as glaucoma patients.

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The following diagram illustrates how increased IOP eventually leads to increased pressure on the optic nerve, resulting in gradual loss of vision and ultimately visual disability and blindness.

The ciliary body in the eye is the tissue that produces aqueous humor, the production of which is commonly referred to as fluid inflow. The fluid leaves the eye primarily through the TM, the process of which is commonly referred to as fluid outflow. The healthy eye maintains a state of IOP homeostasis through a constant physiological process of aqueous humor production and drainage. The deteriorating function of the TM in glaucoma leads to increased resistance to fluid outflow and higher IOP. There is also a secondary drain for the fluid in the eye known as the uveoscleral pathway, which is typically responsible for approximately 20% of fluid drainage.

In addition to aqueous humor production and drainage through the TM and uveoscleral pathway, EVP plays a significant role in the regulation of IOP. EVP represents the pressure of the blood in the episcleral veins of the eye which are the site of drainage of eye fluid into the bloodstream. Historical studies have shown that EVP accounts for approximately half of IOP in normotensive subjects and approximately one-third of IOP in patients with pressures of 24 to 30 mmHg. When EVP is lowered, aqueous humor is able to flow more freely from the eye.

Patients are diagnosed through measurements of IOP using Goldmann applanation tonometry, the standard device used by clinicians to measure IOP, along with an evaluation of visual fields and observing the appearance of the optic nerve. These tests are routinely carried out by eye-care professionals. The initial treatment for patients diagnosed with open-angle glaucoma or ocular hypertension is typically a PGA eye drop. PGAs are designed to lower IOP by increasing outflow through the eye's secondary fluid drain. An eye-care professional will then measure a patient's response to the drug over the first few months. It has been shown that up to 50% of glaucoma patients require more than one drug to treat their IOP. This may occur as early as three to six months after initiating treatment with a PGA. The eye-care professionals may then add a second drug from one of the non-PGA classes, to be used together with the initial drug, or switch to a fixed-combination of two drugs in a single eye drop, or select an alternative single treatment. The reason so many patients eventually need more than one drug is generally considered to be a reflection of the progressive nature of the disease at the TM.

In severe glaucoma cases, patients may need to undergo an invasive surgical procedure. Trabeculectomy is the most common glaucoma-related surgical procedure, also referred to as filtration surgery, in which a piece of tissue in the drainage angle of the eye is removed, creating an opening to the outside of the eye. The opening is partially covered with a scleral flap, the white part of the eye, and the conjunctiva, the thin membrane covering the sclera. This new opening allows fluid to drain out of the eye, bypassing the clogged drainage channels of the TM to maintain a lowered IOP. Devices called shunts are used in glaucoma surgery to divert fluid in a controlled manner from the inside of the eye to the subconjunctival space bypassing the blocked TM. Generally, the shunts reduce IOP to the extent that the use of drops can be reduced, but often not completely eliminated. Many patients continue to require eye drops even following surgery.

Competition

The pharmaceutical industry is characterized by rapidly advancing technologies, intense competition and a strong emphasis on proprietary products. While we believe that our experience and scientific knowledge provide us with competitive advantages, we face competition from established branded and generic pharmaceutical companies, such as Bausch + Lomb, Inc. (acquired in 2013 by Valeant Pharmaceuticals International, Inc.), Merck & Co., Inc., Novartis International AG, Allergan, Inc. (acquired in 2014 by Actavis plc), Santen Inc. and smaller biotechnology and pharmaceutical companies as well as from academic institutions, government agencies and private and public research institutions, which may in the future develop products to treat

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glaucoma. Any product candidates that we successfully develop and commercialize will compete with existing therapies and new therapies that may become available in the future. We believe that the key competitive factors affecting the success of our product candidates, if approved, are likely to be efficacy, safety, convenience, price, tolerability and the availability of reimbursement from government and other third-party payors.

We expect to compete directly against companies producing existing and future glaucoma treatment products. The most commonly approved classes of eye drops to lower IOP in glaucoma are discussed below:

PGA Drug Class

- Prostaglandin Analogues (PGAs). Most PGAs are once-daily dosed eye drops generally prescribed as the initial drug to reduce IOP by increasing fluid outflow through the eye's secondary drain. They do not target the diseased tissue, or TM. PGAs represent approximately half of the U.S. and European prescription volume for the treatment of glaucoma.

Xalatan (latanoprost), the best-selling PGA, together with Xalacom, its fixed-combination with a beta blocker, which is not available in the United States, had worldwide peak sales of approximately $1.7 billion before its patent expired in 2012, according to publicly reported sales. The adverse effects of PGAs include hyperemia or eye redness, irreversible change in iris color, discoloration of the skin around the eyes, and droopiness of eyelids caused by the loss of orbital fat. PGAs should be used with caution in patients with a history of intraocular inflammation.

Non-PGA Drug Class

- Beta Blockers. Beta blockers, with their MOA designed to inhibit aqueous production, are one of the oldest approved drugs for the lowering of IOP. The most commonly used drug in this class is timolol. Beta blockers are less effective than PGAs in terms of IOP lowering and are typically used twice daily. Beta blockers are the most commonly used non-PGA drug. They are used as an initially prescribed monotherapy and as an adjunct therapy to PGAs when the efficacy of PGAs is insufficient. Beta blocker eye drops have contraindications in their label as a result of systemic exposure from topical application of the eye drops, potentially leading to cardio-pulmonary events such as bronchospasm, arrhythmia and heart failure.
- Carbonic Anhydrase Inhibitors. Carbonic anhydrase inhibitors, with their MOA designed to inhibit aqueous production, are less effective than PGAs and are required to be dosed three times daily in order to obtain the desired IOP lowering. In published clinical studies of carbonic anhydrase inhibitors, the most frequently reported adverse events reported were blurred vision and bitter, sour or unusual taste. Carbonic anhydrase inhibitors are sulfonamides and, as such, systemic exposure increases risk of adverse responses such as Stevens Johnson syndrome and blood dyscrasias.
- Alpha Agonists. Alpha agonists, with their MOA designed to inhibit aqueous production plus have an effect on uveoscleral outflow, are less effective than PGAs and need to be dosed three times daily in order to obtain the desired IOP lowering. In clinical studies, the most frequently reported adverse reactions that occurred in individuals receiving brimonidine ophthalmic solution, a commonly prescribed alpha agonist, included allergic conjunctivitis, conjunctival hyperemia, eye pruritus, burning sensation, conjunctival folliculosis, hypertension, ocular allergic reaction, oral dryness and visual disturbance.

Despite their modest efficacy, safety and tolerability profiles, the requirement for two to three doses per day, and the fact that they do not target the diseased tissue in glaucoma, the beta blocker, carbonic anhydrase inhibitor and alpha agonist products account for up to half of the total prescription volume for the treatment of glaucoma based on historical prescription patterns, with beta blocker timolol being the most widely prescribed non-PGA drug. This is driven by the PGA products not being sufficiently effective as monotherapy for up to half of all glaucoma patients. Among the non-PGA drug classes, brands such as Allergan's Alphagan / Combigan franchise generated combined global revenues in 2012 of over $420 million, and prior to the introduction of generics, the branded beta blockers and carbonic anhydrase inhibitors generated peak annual product revenues of over $400 million. Despite targeting the secondary drain and not the diseased TM, and despite cosmetic side effects, Xalatan (latanoprost), the best-selling PGA, and Xalacom, its fixed-combination with a beta blocker, which is not available in the United States, generated

peak annual global revenues of approximately $1.7 billion prior to the introduction of its generic equivalents. Fixed-combination glaucoma products are currently marketed in the United States, including Cosopt, the combination of a beta blocker with a carbonic anhydrase inhibitor, and Combigan, the combination of a beta blocker with an alpha agonist. In April 2013, Alcon announced FDA approval of Simbrinza, a fixed-dose combination of brinzolamide, a carbonic anhydrase inhibitor, and brimonidine tartrate, an alpha agonist, which requires dosing three times per day. There are no fixed-combinations of PGAs with other glaucoma drugs currently available in the United States.

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In addition to demonstrating suboptimal efficacy and safety profiles, many of the older glaucoma drugs are associated with compliance issues. For example, non-compliance can result from the difficulty of administering multiple eye drops in a single day. Challenges such as this are magnified for elderly patients, who constitute a large and growing proportion of the glaucoma population.

Administering multiple eye drops two or three times daily also increases exposure of patients to the preservatives in eye drops. Over time, this increased exposure may lead to damage to the surface of the cornea resulting in discomfort and symptoms of dry eye disease.

New eye drops for the treatment of glaucoma continue to be developed by our competitors. The following table outlines publicly disclosed development programs for the treatment of glaucoma of which we are aware.

New MOAs

Brand	MOA / Dosing	Trial Stage
Rhopressa™ (Aerie AR-13324)	ROCK/NET inhibitor (qd)	Phase 3
Roclatan™ (Aerie PG324)	ROCK/NET inhibitor + PGA (qd)	Phase 3
K-115 (Kowa)	ROCK inhibitor (bid)	Approved in Japan[1]
AMA0076 (Amakem)	ROCK inhibitor (bid)	Phase 2a
INO-8875 (Inotek)	Adenosine-A1 agonist (bid or qd)	Phase 2
OPA-6566 (Acucela)	Adenosine-A2a agonist (bid)	Phase 1/2
SYL040012 (Sylentis)	RNAi beta blocker (qd)	Phase 2

New PGAs[2]

Brand	MOA / Dosing	Trial Stage
BOL-303259 (Bausch + Lomb)	NO donating latanoprost (qd)	Phase 3
DE-117 (Santen)	EP2 agonist (qd)	Phase 2
ONO-9054 (Ono)	FP/EP3 agonist (qd)	Phase 2

[1]Approved in Japan on September 29, 2014 as an adjunctive therapy.
[2]Not usable as add-on therapy to current PGAs.

Many of our competitors have significantly greater financial resources and expertise in research and development, manufacturing, preclinical testing, conducting clinical trials, obtaining regulatory approvals and marketing approved products than we do. In early 2013, Sucampo Pharmaceuticals, Inc. commercially relaunched Rescula, a twice-daily dosed PGA, with the claim that it reduces elevated IOP by increasing the outflow of aqueous humor through the TM. Additionally, Bausch + Lomb Inc., a wholly owned subsidiary of Valeant Pharmaceuticals International, Inc., is developing a nitric oxide-donating latanoprost and is currently in Phase 3 clinical trials. Early-stage companies are also developing glaucoma treatments and may prove to be significant competitors, such as Inotek Pharmaceuticals, which is developing an adenosine receptor agonist. We expect that our competitors will continue to develop new glaucoma treatments, which may include eye drops, oral treatments, surgical procedures, implantable devices or laser treatments. Alternative treatments beyond eye drops continue to develop.

Other early-stage companies may also compete through collaborative arrangements with large and established companies. Mergers and acquisitions in the pharmaceutical and biotechnology industries may result in even more resources being concentrated among a smaller number of our competitors. These competitors also compete with us in recruiting and retaining qualified scientific and management personnel and establishing clinical trial sites and patient registration for clinical trials, as well as in acquiring technologies complementary to, or necessary for, our programs. Our commercial opportunity could be reduced or eliminated if our competitors develop and commercialize products that are safer, more effective, have fewer adverse effects, are more convenient or are less expensive than any products that we may develop. Our competitors also may obtain FDA or other regulatory approval for their products more rapidly than we may obtain approval for ours. In addition, our ability to compete may be affected because in many cases insurers or other third-party payors encourage the use of generic products. Our industry is highly competitive

and is currently dominated by generic drugs, such as latanoprost and timolol, and additional products are expected to become available on a generic basis over the coming years. If any of our product candidates are approved, we expect that they will be priced at a premium over competitive generic products and consistent with other branded glaucoma drugs.

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Manufacturing

AR-13324, the active ingredient in Rhopressa™, is a small molecule and capable of being manufactured in reliable and reproducible synthetic processes from readily available starting materials. We believe the chemistry used to manufacture AR-13324 and Rhopressa™ is amenable to scale up and does not require unusual equipment in the manufacturing process. We do not currently operate manufacturing facilities for clinical or commercial production of our product candidates. We currently rely on third-party manufacturers to produce the active pharmaceutical ingredient and final drug product for our clinical trials. We manage such production with all our vendors on a purchase order basis in accordance with applicable master service and supply agreements. We do not have long-term agreements with any of these or any other third-party suppliers to support our clinical trials. Latanoprost, used in the manufacture of Roclatan™, is available in commercial quantities from multiple reputable third-party manufacturers. We intend to procure quantities on a purchase order basis for our clinical and commercial production. If any of our existing third-party suppliers should become unavailable to us for any reason, we believe that there are a number of potential replacements, although we might experience a delay in our ability to obtain alternative suppliers.

With respect to commercial production of our potential products in the future, we plan on outsourcing production of the active pharmaceutical ingredients and final drug product manufacturing if they are approved for marketing by the applicable regulatory authorities. We have entered into a contractual relationship for the commercial final drug product manufacturing. However, we do not have any current contractual relationships for the commercial production of the active pharmaceutical ingredients.

We expect to continue to develop drug candidates that can be produced cost-effectively at contract manufacturing facilities. However, should a supplier or manufacturer on which we have relied to produce a product candidate provide us with a faulty product or such product is later recalled, we would likely experience delays and additional costs, each of which could be significant.

Intellectual Property

We have obtained patent protection for our primary product candidates, Rhopressa™ and Roclatan™ (patent protection for Roclatan™ arises from the patent protection we have secured for Rhopressa™), in the United States and certain foreign jurisdictions and are seeking patent protection in a number of other foreign jurisdictions for these product candidates. We intend to maintain and defend our patent rights to protect our technology, inventions, processes and improvements that are commercially important to the development of our business. We cannot be sure that any of our existing patents or patents we obtain in the future will be commercially useful in protecting our technology. We cannot be sure that our patents will issue on any of our pending patent applications or patent applications we file in the future. Our commercial success also depends in part on our non-infringement of the patents or proprietary rights of third parties. For a more comprehensive discussion of the risks related to our intellectual property, see “Risk Factors-Risks Related to Intellectual Property.”

Our intellectual property consists of issued patents, and pending patent applications for compositions of matter and methods of use, for our product candidates and other proprietary technology. For our primary product candidates Rhopressa™ and Roclatan™, we hold U.S. Patent 8,450,344, which is scheduled to expire in 2026, and U.S. Patent 8,394,826, which is scheduled to expire in 2030, each of which has claims directed to composition of matter and method of use. We hold patents for composition of matter and method of use in certain foreign jurisdictions for our primary product candidates. Additionally, we hold patents for other ROCK Inhibitor molecules.

We have established and continue to build proprietary positions for our product candidates and related technology in the United States and other jurisdictions. As of December 31, 2014, we had 44 United States or foreign issued patents that cover various aspects of our current and previously discontinued product candidates and our other proprietary technology and 22 U.S. patent applications or foreign patent applications that, if patents were to issue based on the existing claims, would cover various aspects of our current and previously discontinued product candidates and our other proprietary technology.

Aerie® is a registered trademark of ours and we have applications pending from the U.S. Patent and Trademark Office, or USPTO, for the registration of our trademarks Rhopressa™ and Roclatan™.

In October 2012, our board of directors authorized the divestiture of certain non-core intellectual property relating to implantable ophthalmic devices for future development by Novaer Holding, Inc., or Novaer, an independent company. In addition, as part of this transaction, we also licensed the non-ophthalmic rights to our intellectual property portfolio to Novaer. See Note 15 to our audited financial statements appearing elsewhere in this report.

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On September 6, 2013, we terminated our agreement to exclusively license to Novaer our intellectual property for non-ophthalmic indications. No consideration, or future obligation thereof, was exchanged in connection with this termination. Since September 6, 2013, we own all of the worldwide rights to our current product candidates for all indications, both ophthalmic and non-ophthalmic.

Regulatory Matters

FDA Regulation and Marketing Approval

In the United States, the FDA regulates drugs under the Federal Food, Drug, and Cosmetic Act, or FDCA, and related regulations. Drugs are also subject to other federal, state and local statutes and regulations. Failure to comply with the applicable United States regulatory requirements at any time during the product development process, approval process or after approval may subject an applicant to administrative or judicial sanctions and non-approval of product candidates. These sanctions could include the imposition by the FDA or an Institutional Review Board, or IRB, of a clinical hold on trials, the FDA's refusal to approve pending applications or related supplements, withdrawal of an approval, untitled or warning letters, product recalls, product seizures, total or partial suspension of production or distribution, injunctions, fines, restitution, disgorgement, civil penalties or criminal prosecution. Such actions by government agencies could also require us to expend a large amount of resources to respond to the actions. Any agency or judicial enforcement action could have a material adverse effect on us.

The FDA and comparable regulatory agencies in state and local jurisdictions and in foreign countries impose substantial requirements upon the clinical development, manufacture and marketing of pharmaceutical products. These agencies and other federal, state and local entities regulate research and development activities and the testing, manufacture, quality control, safety, effectiveness, labeling, packaging, storage, distribution, record keeping, approval, post-approval monitoring, advertising, promotion, sampling and import and export of our products. Our drugs must be approved by the FDA through the NDA process before they may be legally marketed in the United States. See "—The NDA Approval Process" below.

The process required by the FDA before drugs may be marketed in the United States generally involves the following:

- completion of non-clinical laboratory tests, animal studies and formulation studies conducted according to Good Laboratory Practices or other applicable regulations;
- submission of an IND, which allows clinical trials to begin unless FDA objects within 30 days;
- adequate and well-controlled human clinical trials to establish the safety and efficacy of the proposed drug for its intended use or uses conducted in accordance with FDA regulations, Good Clinical Practices, or GCP, which are international ethical and scientific quality standards meant to assure the rights, safety and well-being of trial participants are protected and to define the roles of clinical trial sponsors, administrators, and monitors;
- pre-approval inspection of manufacturing facilities and clinical trial sites; and
- FDA approval of an NDA, which must occur before a drug can be marketed or sold.

IND and Clinical Trials

Prior to commencing the first clinical trial, an initial IND, which contains the results of preclinical tests along with other information, such as information about product chemistry, manufacturing and controls and a proposed protocol, must be submitted to the FDA. The IND automatically becomes effective 30 days after receipt by the FDA unless the FDA within the 30-day time period raises concerns or questions about the conduct of the clinical trial. In such a case, the IND sponsor must resolve any outstanding concerns with the FDA before the clinical trial may begin. A separate submission to the existing IND must be made for each successive clinical trial to be conducted during product development. Further, an independent IRB for each site proposing to conduct the clinical trial must review and approve the plan for any clinical trial before it commences at that site. Informed written consent must also be obtained from each trial subject. Regulatory authorities, including the FDA, an IRB, a data safety monitoring board or the sponsor, may suspend or terminate a clinical trial at any time on various grounds, including a finding that the participants are being exposed to an unacceptable health risk or that the clinical trial is not being conducted in accordance with FDA requirements.

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For purposes of NDA approval, human clinical trials are typically conducted in sequential phases that may overlap:

- Phase 1—the drug is initially given to healthy human subjects or patients and tested for safety, dosage tolerance, absorption, metabolism, distribution and excretion. These trials may also provide early evidence on effectiveness. During Phase 1 clinical trials, sufficient information about the investigational drug's pharmacokinetics and pharmacologic effects may be obtained to permit the design of well- controlled and scientifically valid Phase 2 clinical trials.
- Phase 2—trials are conducted in a limited number of patients in the target population to identify possible adverse effects and safety risks, to determine the efficacy of the product for specific targeted diseases and to determine dosage tolerance and optimal dosage. Multiple Phase 2 clinical trials may be conducted by the sponsor to obtain information prior to beginning larger and more expensive Phase 3 clinical trials. Throughout this report, we refer to our initial Phase 2 clinical trials as "Phase 2a clinical trials" and our subsequent Phase 2 clinical trials as "Phase 2b clinical trials."
- Phase 3—when Phase 2 evaluations demonstrate that a dosage range of the product appears effective and has an acceptable safety profile, and provide sufficient information for the design of Phase 3 registration trials, Phase 3 registration trials are undertaken to provide statistically significant evidence of clinical efficacy and to further test for safety in an expanded patient population at multiple clinical trial sites. They are performed after preliminary evidence suggesting effectiveness of the drug has been obtained, and are intended to further evaluate dosage, effectiveness and safety, to establish the overall benefit-risk relationship of the investigational drug and to provide an adequate basis for product labeling and approval by the FDA. In most cases, the FDA requires two adequate and well-controlled Phase 3 clinical trials to demonstrate the efficacy of the drug.

All clinical trials must be conducted in accordance with FDA regulations, GCP requirements and their protocols in order for the data to be considered reliable for regulatory purposes.

An investigational drug product that is a combination of two different drugs in the same dosage form must comply with an additional rule that requires that each component make a contribution to the claimed effects of the drug product. This typically requires larger studies that test the drug against each of its components. In addition, typically, if a drug product is intended to treat a chronic disease, as is the case with our products, safety and efficacy data must be gathered over an extended period of time, which can range from six months to three years or more. Government regulation may delay or prevent marketing of product candidates or new drugs for a considerable period of time and impose costly procedures upon our activities.

Disclosure of Clinical Trial Information

Sponsors of clinical trials of FDA-regulated products, including drugs, are required to register and disclose certain clinical trial information. Information related to the product, patient population, phase of investigation, study sites and investigators, and other aspects of the clinical trial is then made public as part of the registration. Sponsors are also obligated to discuss the results of their clinical trials after completion. Disclosure of the results of these trials can be delayed until the new product or new indication being studied has been approved. Competitors may use this publicly available information to gain knowledge regarding the progress of development programs.

The NDA Approval Process

In order to obtain approval to market a drug in the United States, a marketing application must be submitted to the FDA that provides data establishing to the FDA's satisfaction the safety and effectiveness of the investigational drug for the proposed indication. Each NDA submission requires a substantial user fee payment (currently exceeding $2,300,000 for fiscal year 2015) unless a waiver or exemption applies. The application includes all relevant data available from pertinent non-clinical, preclinical and clinical trials, including negative or ambiguous results as well as positive findings, together with detailed information relating to the product's chemistry, manufacturing, controls and proposed labeling, among other things. Data can come from company-sponsored clinical trials intended to test the safety and effectiveness of a use of a product, or from a number of alternative sources, including studies initiated by investigators that meet GCP requirements.

During the development of a new drug, sponsors are given opportunities to meet with the FDA at certain points. These points may be prior to submission of an IND, at the end of Phase 2, and before an NDA is submitted. Meetings at

other times may be requested. These meetings can provide an opportunity for the sponsor to share information about the data gathered to date, for the FDA to provide advice and for the sponsor and the FDA to reach agreement on the next phase of development. Sponsors

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typically use the end of Phase 2 meetings to discuss their Phase 2 clinical results and present their plans for the pivotal Phase 3 registration trial that they believe will support approval of the new drug.

Concurrent with clinical trials, companies usually complete additional animal safety studies and must also develop additional information about the chemistry and physical characteristics of the drug and finalize a process for manufacturing the product in accordance with current Good Manufacturing Practice, or cGMP, requirements. The manufacturing process must be capable of consistently producing quality batches of the drug candidate and the manufacturer must develop methods for testing the identity, strength, quality and purity of the final drugs. Additionally, appropriate packaging must be selected and tested and stability studies must be conducted to demonstrate that the drug candidate does not undergo unacceptable deterioration over its shelf-life.

The results of product development, non-clinical studies and clinical trials, along with descriptions of the manufacturing process, analytical tests conducted on the chemistry of the drug, proposed labeling and other relevant information are submitted to the FDA as part of an NDA requesting approval to market the product. The FDA reviews all NDAs submitted to ensure that they are sufficiently complete for substantive review before it accepts them for filing. It may request additional information rather than accept a NDA for filing. In this event, the NDA must be resubmitted with the additional information. The resubmitted application also is subject to review before the FDA accepts it for filing. The FDA has 60 days from its receipt of an NDA to conduct an initial review to determine whether the application will be accepted for filing based on the agency's threshold determination that the application is sufficiently complete to permit substantive review. If the NDA submission is accepted for filing, the FDA reviews the NDA to determine, among other things, whether the proposed product is safe and effective for its intended use, and whether the product is being manufactured in accordance with cGMP to assure and preserve the product's identity, strength, quality and purity. The FDA has agreed to specific performance goals on the review of NDAs and seeks to review standard NDAs in 12 months from submission of the NDA. The review process may be extended by the FDA for three additional months to consider certain late submitted information or information intended to clarify information already provided in the submission. After the FDA completes its initial review of an NDA, it will communicate to the sponsor that the drug will either be approved, or it will issue a complete response letter to communicate that the NDA will not be approved in its current form and inform the sponsor of changes that must be made or additional clinical, non-clinical or manufacturing data that must be received before the application can be approved, with no implication regarding the ultimate approvability of the application or the timing of any such approval, if ever. If, or when, those deficiencies have been addressed to the FDA's satisfaction in a resubmission of the NDA, the FDA will issue an approval letter. FDA has committed to reviewing such resubmissions in two to six months depending on the type of information included. The FDA may refer applications for novel drug products or drug products that present difficult questions of safety or efficacy to an advisory committee, typically a panel that includes clinicians and other experts, for review, evaluation and a recommendation as to whether the application should be approved and, if so, under what conditions. 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 typically will inspect the facilities at which the product is manufactured. The FDA will not approve the product unless it determines that the manufacturing processes and facilities are in compliance with cGMP requirements and adequate to assure consistent production of the product within required specifications. Additionally, before approving an NDA, the FDA may inspect one or more clinical sites to assure compliance with GCP. If the FDA determines the application, manufacturing process or manufacturing facilities are not acceptable, it typically will outline the deficiencies and often will request additional testing or information. This may significantly delay further review of the application. If the FDA finds that a clinical site did not conduct the clinical trial in accordance with GCP, the FDA may determine the data generated by the clinical site should be excluded from the primary efficacy analyses provided in the NDA. Additionally, notwithstanding the submission of any requested additional information, the FDA ultimately may decide that the application does not satisfy the regulatory criteria for approval.

The FDA may require, or companies may pursue, additional clinical trials after a product is approved. These so-called Phase 4 trials may be made a condition to be satisfied for continuing drug approval. The results of Phase 4 trials can confirm the effectiveness of a product candidate and can provide important safety information. In addition, the FDA now has express statutory authority to require sponsors to conduct post-marketing trials to specifically address safety issues identified by the agency. See "—Post-Marketing Requirements" below.

The FDA also has authority to require a Risk Evaluation and Mitigation Strategy, or a REMS, from manufacturers to ensure that the benefits of a drug outweigh its risks. A sponsor may also voluntarily propose a REMS as part of the NDA submission. The need for a REMS is determined as part of the review of the NDA. Based on statutory standards, elements of a REMS may include "dear doctor letters," a medication guide, more elaborate targeted educational programs, and in some cases elements to assure safe use, or ETASU. ETASU can include, but are not limited to, special training or certification for prescribing or dispensing, dispensing only under certain circumstances, special monitoring and the use of patient registries. These elements