
**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, DC 20549**

**FORM S-3
REGISTRATION STATEMENT
UNDER
THE SECURITIES ACT OF 1933**

Anthera Pharmaceuticals, Inc.

(Exact name of registrant as specified in its charter)

Delaware
(State or other jurisdiction of
incorporation or organization)

20-1852016
(I.R.S. Employer
Identification No.)

**Anthera Pharmaceuticals, Inc.
25801 Industrial Boulevard, Suite B
Hayward, California 94545
(510) 856-5600**

(Address, including zip code, and telephone number, including area code, of registrant's principal executive offices)

**J. Craig Thompson
Chief Executive Officer
25801 Industrial Boulevard, Suite B
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(Name, address, including zip code, and telephone number, including area code, of agent for service)

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Approximate date of commencement of proposed sale to the public: From time to time after this Registration Statement becomes effective.

If the only securities being registered on this form are being offered pursuant to dividend or interest reinvestment plans, please check the following box.

If any of the securities being registered on this Form are to be offered on a delayed or continuous basis pursuant to Rule 415 under the Securities Act of 1933, as amended, other than securities offered only in connection with dividend or interest reinvestment plans, check the following box:

If this form is filed to register additional securities for an offering pursuant to Rule 462(b) under the Securities Act, please check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering.

If this form is a post-effective amendment filed pursuant to Rule 462(c) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering.

If this Form is a registration statement pursuant to General Instruction I.D. or a post-effective amendment thereto that shall become effective upon filing with the Commission pursuant to Rule 462(e) under the Securities Act, check the following box.

If this Form is a post-effective amendment to a registration statement filed pursuant to General Instruction I.D. filed to register additional securities or additional classes of securities pursuant to Rule 413(b) under the Securities Act, check the following box.

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

Large accelerated filer

Non-accelerated filer (Do not check if a smaller reporting company)

Accelerated filer

Smaller reporting company

Emerging growth company

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 7(a)(2)(B) of the Securities Act.

CALCULATION OF REGISTRATION FEE

Title of Each Class of Securities to be Registered	Amount to be Registered	Proposed Maximum Offering Price PerShare (4)	Proposed Maximum Aggregate Offering Price (4)	Amount of Registration Fee
Common Stock, par value \$0.001 per share	9,932,478(1)	\$1.75	\$17,381,836.50	\$2,164.04
Common Stock, par value \$0.001 per share	2,067,522(2)	\$1.75	\$3,618,163.50	\$450.47
Common Stock, par value \$0.001 per share	16,613,474(3)	\$1.75	\$29,073,579.50	\$3,619.67
Total	28,613,474	\$1.75	\$50,073,579.50	\$6,234.18

- (1) This amount represents shares to be offered by the selling stockholders from time to time after the effective date of this Registration Statement at prevailing market prices at the time of sale. In accordance with Rule 416(a), the registrant is also registering for resale hereunder an indeterminate number of shares that may be issued with respect to the shares being registered hereunder as a result of stock splits, stock dividends or similar transactions. Consists of shares of common stock sold pursuant to a Securities Purchase Agreement dated October 23, 2017 by and among the registrant and the purchasers named therein (the "Securities Purchase Agreement") at the Initial Closing (as defined in Section entitled "Selling Stockholders") and to be sold at the Second Closing (as defined in Section entitled "Selling Stockholders").
- (2) This amount represents shares to be offered by the selling stockholders from time to time after the effective date of this Registration Statement at prevailing market prices at the time of sale. In accordance with Rule 416(a), the registrant is also registering for resale hereunder an indeterminate number of shares that may be issued with respect to the shares being registered hereunder as a result of stock splits, stock dividends or similar transactions. Consists of shares of common stock issuable upon the conversion of an aggregate of 2,067,522 shares of Class Y Convertible Preferred Stock (the "Class Y Preferred Stock") to be sold at the Second Closing.
- (3) This amount represents shares to be offered by the selling stockholders from time to time after the effective date of this Registration Statement at prevailing market prices at the time of sale. In accordance with Rule 416(a), the registrant is also registering for resale hereunder an indeterminate number of shares that may be issued with respect to the shares being registered hereunder as a result of stock splits, stock dividends or similar transactions. Consists of shares of common stock issuable upon the exercise of the Company's warrants (the "Warrants") issued pursuant to the terms of the Securities Purchase Agreement at the Initial Closing and to be issued at the Second Closing.
- (4) Estimated solely for purposes of calculating the amount of the registration fee pursuant to Rule 457(c) of the Securities Act of 1933, as amended (the "Securities Act"), based upon the average of the high and low sales prices of the registrant's common stock as reported on The NASDAQ Global Select Market on November 9, 2017.

THE REGISTRANT HEREBY AMENDS THIS REGISTRATION STATEMENT ON SUCH DATE OR DATES AS MAY BE NECESSARY TO DELAY ITS EFFECTIVE DATE UNTIL THE REGISTRANT SHALL FILE A FURTHER AMENDMENT WHICH SPECIFICALLY STATES THAT THIS REGISTRATION STATEMENT SHALL THEREAFTER BECOME EFFECTIVE IN ACCORDANCE WITH SECTION 8(a) OF THE SECURITIES ACT OF 1933, AS AMENDED, OR UNTIL THE REGISTRATION STATEMENT SHALL BECOME EFFECTIVE ON SUCH DATE AS THE COMMISSION ACTING PURSUANT TO SAID SECTION 8(a), MAY DETERMINE.

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The information in this preliminary prospectus is not complete and may be changed. These securities may not be sold until the registration statement filed with the Securities and Exchange Commission is effective. This preliminary prospectus is not an offer to sell nor does it seek an offer to buy these securities in any jurisdiction where the offer or sale is not permitted.

**SUBJECT TO COMPLETION,
Dated November 13, 2017.**

PROSPECTUS



28,613,474 Shares of Common Stock

This prospectus relates to the resale from time to time of up to 28,613,474 shares of our common stock by the selling stockholders named in this prospectus. These shares consist of:

- 2,306,737 shares of common stock issued to the selling stockholders at the Initial Closing;
- 7,625,741 shares of common stock to be issued to the selling stockholders at the Second Closing;
- 2,067,522 shares of common stock issuable upon conversion of the Class Y Preferred Stock to be issued to the selling stockholders at the Second Closing;
- 6,920,211 shares of common stock issuable upon exercise of warrants issued to the selling stockholders at the Initial Closing; and
- 9,693,263 shares of common stock issuable upon exercise of warrants to be issued to the selling stockholders at the Second Closing.

We are not selling any securities under this prospectus and we will not receive any of the proceeds from the sale of our common stock by the selling stockholders. We will, however, receive the net proceeds of any warrants exercised for cash.

The selling stockholders may resell or dispose of the shares of our common stock, or interests therein, at fixed prices, at prevailing market prices at the time of sale or at prices negotiated with purchasers, to or through underwriters, broker-dealers, agents, or through any other means described in this prospectus under "Plan of Distribution." The selling stockholders will bear all selling commissions and underwriting discounts, if any, attributable to the sale or disposition of the shares, or interests therein. We will bear all costs, expenses and fees in connection with the registration of the shares.

You should read this document and any prospectus supplement or amendment carefully before you invest in our securities.

Our common stock is listed on The NASDAQ Global Market under the symbol "ANTH." On November 9, 2017, the closing price for our common stock, as reported on The NASDAQ Global Market, was \$1.86 per share. Our principal executive offices are located at 25801 Industrial Boulevard, Suite B, Hayward, California 94545.

Investing in our securities involves a high degree of risk. You should review carefully the risks and uncertainties described under the heading "[Risk Factors](#)" contained in this prospectus beginning on page 2 and any applicable prospectus supplement, and under similar headings in the other documents that are incorporated by reference into this prospectus.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or determined if this prospectus is truthful or complete. Any representation to the contrary is a criminal offense.

The date of this Prospectus is November , 2017.

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ABOUT THIS PROSPECTUS

This prospectus is part of a registration statement that we filed with the Securities and Exchange Commission (“SEC”). The selling stockholders may from time to time sell up to 28,613,474 shares of common stock, as described in this prospectus, in one or more offerings. We have agreed to pay the expenses incurred in registering these shares, including legal and accounting fees.

This prospectus provides you with a general description of the securities the selling stockholders may offer. You should read this prospectus and the additional information described under the heading “Where You Can Find More Information” beginning on page 23 of this prospectus.

You should rely only on the information contained in or incorporated by reference in this prospectus. Neither we nor any selling stockholder have authorized anyone to provide you with different information. The selling stockholders are offering to sell, and seeking offers to buy, shares of our common stock only in jurisdictions where it is lawful to do so. The selling stockholders are not making an offer of these shares in any jurisdiction where the offer is not permitted.

You should assume that the information appearing in this prospectus is accurate only as of the date of this prospectus, regardless of the time of delivery of this prospectus or any sale of our common stock.

Unless the context otherwise requires, we use the terms “Anthera Pharmaceuticals,” “Anthera,” “we,” “us,” “the Company” and “our” in this prospectus to refer to Anthera Pharmaceuticals, Inc. and its subsidiaries.

RISK FACTORS

Investing in our securities involves a high degree of risk. In addition to the other information included in, or incorporated by reference into, this prospectus, you should carefully consider the risk factors incorporated by reference from our Annual Report on Form 10-K for the year ended December 31, 2016, and our Quarterly Reports on Form 10-Q for the quarters ended March 31, 2017, June 30, 2017 and September 30, 2017 which are on file with the SEC and are incorporated by reference into this prospectus, as the same may be updated from time to time by our future filings under the Securities Exchange Act of 1934, as amended (the “Exchange Act”), when determining whether or not to purchase the securities offered under this prospectus, in addition to the following:

Future sales of our common stock by the selling stockholders could cause our stock price to decline.

Sales of a substantial number of shares of our common stock by the selling stockholders in the public market or the perception that these sales might occur, could depress the market price of our common stock and could impair our ability to raise capital through the sale of additional equity securities, even if there is no relationship between such sales and the performance of our business.

We will not be able to meet our cash requirements beyond the first quarter of 2018 without obtaining additional capital from external sources if the Second Closing of the Private Placement does not occur, and if we are unable to do so, we may not be able to continue as a going concern.

We anticipate that our cash and cash equivalents of \$6.1 million as of September 30, 2017, together with the proceeds from the Initial Closing of the Private Placement (as defined in the section entitled “Selling Stockholders”) will meet our cash requirements into the fourth quarter of 2017. If the Second Closing occurs, we anticipate we will be able to meet our cash requirements into the second quarter of 2018. However, in order for us to continue as a going concern beyond the fourth quarter of 2017 (if the Private Placement Second Closing does not occur) or beyond the second quarter of 2018 (if the Private Placement Second Closing does occur), we will be required to obtain capital from external sources.

CAUTIONARY STATEMENT REGARDING FORWARD-LOOKING STATEMENTS

This prospectus and the documents incorporated by reference into it contain forward-looking statements. Forward-looking statements relate to future events or our future financial performance. We generally identify forward-looking statements by terminology such as “may,” “will,” “would,” “should,” “expects,” “plans,” “anticipates,” “could,” “intends,” “target,” “projects,” “contemplates,” “believes,” “estimates,” “predicts,” “assume,” “intend,” “potential,” “continue” or other similar words or the negative of these terms. These statements are only predictions. We have based these forward-looking statements largely on our current expectations and projections about future events and financial trends that we believe may affect our business, financial condition and results of operations. The outcome of the events described in these forward-looking statements is subject to risks, uncertainties and other factors described in “Risk Factors” and in our periodic filings with the SEC, incorporated by reference or included in this prospectus or any prospectus supplement. Accordingly, you should not place undue reliance upon these forward-looking statements. We cannot assure you that the events and circumstances reflected in the forward-looking statements will be achieved or occur, the timing of events and circumstances and actual results could differ materially from those projected in the forward looking statements. Forward-looking statements contained in this prospectus include, but are not limited to, statements about:

- our expectations related to the use of proceeds, if any, from this offering;
- the progress of, timing of and amount of expenses associated with our research, development and commercialization activities;
- the timing, conduct and success of our clinical studies for our product candidates;
- our ability to obtain U.S. and foreign regulatory approval for our product candidates and the ability of our product candidates to meet existing or future regulatory standards;
- our expectations regarding federal, state and foreign regulatory requirements;
- the therapeutic benefits and effectiveness of our product candidates;
- the accuracy of our estimates of the size and characteristics of the markets that may be addressed by our product candidates;
- our ability to manufacture sufficient amounts of our product candidates for clinical studies and products for commercialization activities;
- our intention to seek to establish strategic collaborations or partnerships for the development or sale of our product candidates;
- our expectations as to future financial performance, expense levels and liquidity sources;
- the timing of commercializing our product candidates;
- our ability to compete with other companies that are or may be developing or selling products that are competitive with our product candidates;
- anticipated trends and challenges in our potential markets;
- our ability to attract and retain key personnel; and
- other factors discussed elsewhere in this prospectus or any prospectus supplement.

The forward-looking statements made or incorporated by reference in this prospectus relate only to events as of the date on which the statements are made. We have included important factors in the cautionary statements included in this prospectus and incorporated herein by reference, including under the caption entitled “Risk Factors” that we believe could cause actual results or events to differ materially from the forward-looking statements that we make. Our forward-looking statements do not reflect the potential impact of any future acquisitions, mergers, dispositions, joint ventures or investments we may make. Except as required by law, we do not assume any intent to update any forward-looking statements after the date on which the statement is made, whether as a result of new information, future events or circumstances or otherwise.

THE COMPANY

We are a biopharmaceutical company focused on advancing the development and commercialization of innovative medicines that benefit patients with unmet medical needs. We currently have two compounds in development, Sollpura and blisibimod. We licensed Sollpura from Eli Lilly & Co in July 2014. Sollpura is a novel non-porcine investigational Pancreatic Enzyme Replacement Therapy (“PERT”) intended for the treatment of patients with Exocrine Pancreatic Insufficiency (“EPI”), often seen in patients with cystic fibrosis and other conditions. We licensed blisibimod from Amgen, Inc. in December 2007. Blisibimod targets B-cell activating factor, or BAFF, which has been shown to be elevated in a variety of B-cell mediated autoimmune diseases, including Immunoglobulin A nephropathy, or IgA nephropathy.

Our Phase 3 Development of Sollpura in EPI

We initiated the Phase 3 SOLUTION study in the third quarter of 2015. SOLUTION was a randomized, open-label, assessor-blind, non-inferiority, active-comparator study evaluating the efficacy and safety of Sollpura in patients with cystic fibrosis-related exocrine pancreatic insufficiency. This pivotal study enrolled 128 patients in North America, Europe and Israel was intended to evaluate the non-inferiority of Sollpura compared with another commercially available PERT in a population of porcine-derived PERT responders. Topline data announced in December 2016 showed that the study narrowly missed the CFA non-inferiority margin of the primary modified Intent to Treat (mITT) analysis by one percent; however, by additional pre-specified analyses of CFA (mITT-Baseline Observation Carried Forward and Per Protocol), Sollpura met the non-inferiority criterion. The study also confirmed that the ratio of the three enzymes in Sollpura demonstrated an appropriate response in the coefficient of nitrogen absorption (“CNA”). CNA is a measure of protein digestion and absorption and is a key requirement of our planned US Food and Drug Administration regulatory submission. In March 2017, we announced data from the extension phase of the study, which showed that Sollpura demonstrated comparable maintenance in key measurements of height, weight, and body mass index in addition to being well tolerated throughout the 12-week extension period.

Due to the narrow miss of the SOLUTION study and informed by its data, we initiated a new Phase 3 study (RESULT) in the second quarter of 2017. Similar to the SOLUTION study, the RESULT study is a randomized, open-label, non-inferiority, active-comparator study. Approximately 150 cystic fibrosis patients who are porcine PERT responders will be enrolled in the US, Europe and Israel. Based on data from the analysis from the SOLUTION study, we believe that efficacy in the SOLUTION trial was limited by a restrictive dose optimization paradigm in a population whose dose of lipase at baseline had been optimized for porcine PERTs (but not for Sollpura) and that modification of the dosing paradigm may allow for success in the RESULT study. The RESULT study’s design is modified from the SOLUTION study design to account for the design limitations in the SOLUTION study by 1) starting Sollpura dosing as 125% of the pre-study PERT dose, 2) allowing for a more “real life” dose adjustment, as needed, based on signs and symptoms throughout the primary treatment phase of the study, and 3) randomizing the use of acid suppression on a 1-to-1 basis, as is seen in cystic fibrosis patients. The study design was discussed with the FDA in the first quarter of 2017. As of September 30, 2017, the RESULT study has initiated screening on more than 50% of patients. In July 2017, the Company was informed that the RESULT study had been approved by the Cystic Fibrosis Foundation Therapeutics Development Network (CFF-TDN) Protocol Review Committee. In August 2017, the European Cystic Fibrosis Society Clinical Trial Network (ECFS CTN) Executive Committee approved the RESULT study. We believe the approval of the RESULT study by the CFF-TDN and ECFS CTN may expedite patient recruitment in the U.S and EU. The safety of subjects enrolled in this study will be monitored by independent experts appointed by the CFF-TDN. Top line data from the RESULT study, which will be evaluated after assessment of coefficient of fat absorption after 4 weeks of dosing, is expected in the first quarter of 2018.

A second, smaller Phase 3 study, SIMPLICITY, was initiated in the second quarter of 2016. The SIMPLICITY study utilizes sachets containing Sollpura powder for oral solution. The study was designed in two parts (Part A and Part B). Part A which evaluated the safety and general usability of Sollpura powder for oral

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solution in 15 patients \geq 7 years of age, was completed in the fourth quarter of 2016. On December 9, 2016, an independent Data Monitoring Committee evaluated the data from Part A and approved progression to Part B, which will enroll pediatric subjects below 7 years of age. Before we proceed with Part B, we plan to amend the SIMPLICITY study to follow a similar dosing approach as the RESULT study and initiate enrollment in Part B after we report topline data from the RESULT study.

During the third quarter of 2016, we initiated the EASY study, which provides continued access to Sollpura for patients in the Sollpura study arm who completed the SOLUTION study. We plan to modify the EASY study to allow certain patients completing the RESULT study to have continued access to Sollpura until the Biological License Application for Sollpura is approved by the FDA.

- We believe our Sollpura studies may offer potential opportunities for differentiation versus the currently marketed porcine-derived PERTs, including:
- use of biotechnology-derived high-purity enzymes that are produced by fermentation processes rather than from mammalian organs, the latter of which requires a warning label for potential viral transmission;
- ability to manufacture at a fixed ratio of lipase, protease and amylase that is similar to the enzyme secretions from the human pancreas;
- use of a novel, chemically-modified lipase drug substance that provides resistance to degradation at gastric pH, thereby obviating the need for enteric coating;
- lack of enteric coating, which allows for potentially fewer and smaller easy-to-swallow capsules and adequate storage stability compared with porcine PERTs of an equivalent unit dose strength; and
- a sachet formulation containing Sollpura powder for oral solution which can be easily dissolved into water that provides patients, especially young pediatric patients, with an easy-to-swallow dosing option.

Our Phase 2 Development of Blisibimod for in IgA Nephropathy

In June 2013, we initiated a Phase 2 clinical study, (“BRIGHT-SC”) of patients with IgA nephropathy in Asia and Eastern Europe. The BRIGHT-SC study is a Phase 2 multicenter, randomized, double-blind, placebo-controlled study to evaluate the efficacy, safety, tolerability and immunogenicity of blisibimod in IgA nephropathy. Enrollment criteria are biopsy-proven IgA nephropathy and proteinuria greater than one gram but less than six grams per 24 hours (1g-6g/24hr). Patients must be receiving standard of care medication including angiotensin converting enzyme inhibitors and angiotensin receptor blockers. Patients enrolled in the BRIGHT-SC study receive 300mg weekly blisibimod or placebo subcutaneously during the first 8 weeks of therapy, the induction phase, followed by a minimum of 24 weeks of 200mg weekly blisibimod or placebo, the maintenance phase. Patients may elect to continue to receive the blinded study drug for up to 2 years. The BRIGHT-SC study enrolled 58 patients.

In March 2015, an interim futility analysis of the BRIGHT-SC study was conducted by an independent unblinded statistician, who evaluated several important biomarkers of renal disease in patients who had completed at least 8 weeks of treatment and recommended the study to continue to completion as planned.

In June 2016, an interim analysis of the BRIGHT-SC study was conducted after all ongoing patients had completed at least 24 weeks of treatment, and the results showed a tendency toward lower proteinuria in blisibimod versus placebo treated patients. While the numerical reduction in proteinuria in blisibimod versus placebo treated patients at week 24 did not meet the predefined statistical primary endpoint of complete or partial response, longer-term data from the study demonstrated an increasingly large separation in proteinuria favoring the blisibimod treated arm compared to the placebo. Additionally, secondary biomarker data from the study, including changes in total B cell counts and changes in immunoglobulins IgA, IgG, and IgM, were highly

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consistent with previous studies with blisibimod in patients with other diseases and demonstrated marked reduction after 8 weeks on study.

In December 2016, an additional interim analysis of the BRIGHT-SC study was reported after all ongoing patients had completed at least 48 weeks. In this extension analysis there was again a trend toward slowing the progression of proteinuria with blisibimod.

In August 2017, we received orphan drug designation from the U.S. FDA for blisibimod for the treatment of IgA nephropathy. Additionally, in August 2017, we announced top line data from the completed extension of the BRIGHT-SC study in which all patients had the opportunity to complete at least 60 weeks of treatment and some patients were treated for up to 2 years. Throughout the treatment period and for up to one year of additional follow-up off treatment, blisibimod appeared to halt disease progression as measured by the mean estimate of 24-hour urinary protein excretion levels. Specifically, in patients treated with blisibimod, the mean change in proteinuria was stable to trending slightly downward, whereas the mean levels increased for patients in the placebo arm. Additionally, blisibimod showed a trend toward preservation of renal function based upon individual rates of change in estimated glomerular filtration rate (eGFR), with an annualized improvement of +6.2mL/min/1.73 m² of body surface area per year compared to a worsening of -4.8 mL/min/1.73 m² with placebo. As seen with previous interim analyses of the BRIGHT data, serum immunoglobulins IgA, IgG, and IgM, continued to demonstrate marked reduction throughout the treatment period.

For additional information about our company, please refer to other documents we have filed with the SEC and that are incorporated by reference into this prospectus, as listed under the heading "Incorporation of Certain Information by Reference." Copies of our current and periodic reports filed with the SEC are available at the SEC Public Reference Room at 100 F Street, N.E., Washington, D.C. 20549, and online at www.sec.gov and our website at www.anthera.com. The information contained on our website or that can be accessed through our website is not incorporated by reference into this prospectus and is not part of this prospectus.

We were incorporated in Delaware on September 9, 2004 as Anthera Pharmaceuticals, Inc. Our corporate headquarters are located at 25801 Industrial Boulevard, Suite B, Hayward, California 94545 and our telephone number is (510) 856-5600.

We use various trademarks, service marks and trade names in our business, including without limitation "Anthera Pharmaceuticals" and "Anthera." This prospectus also contains trademarks, service marks and trade names of other businesses that are the property of their respective holders.

USE OF PROCEEDS

The proceeds from the sale of the shares offered pursuant to this prospectus are solely for the accounts of the selling stockholders. Accordingly, we will not receive any proceeds from the sale of shares of our common stock by any selling stockholder. We have agreed to pay all costs, expenses and fees relating to registering the shares of our common stock referenced in this prospectus. The selling stockholders will pay any brokerage commissions and/or similar charges incurred in connection with the sale or other disposition by them of the shares covered hereby.

DESCRIPTION OF CAPITAL STOCK

The following description of our common stock and preferred stock, together with the additional information we include in any applicable prospectus supplements, summarizes the material terms and provisions of our capital stock. The following description of our capital stock does not purport to be complete and is subject to, and qualified in its entirety by, our certificate of incorporation and bylaws, which are exhibits to the registration statement of which this prospectus forms a part, and by applicable law. The terms of our common stock and preferred stock may also be affected by Delaware law.

Authorized Capital Stock

Our authorized capital stock consists of 100,000,000 shares of common stock, par value \$0.001 per share, and 5,000,000 shares of undesignated preferred stock, of which 17,000 shares have been designated as Series X Convertible Preferred Stock, 28,330 shares have been designated as Series X-1 Convertible Preferred Stock and 2,067,522 shares have been designated as Class Y Preferred Stock (together with the Series X Convertible Preferred Stock and the Series X-1 Convertible Preferred Stock, the "Preferred Stock"), each with a par value of \$0.001 per share. As of October 31, 2017, we had 13,849,678 shares of common stock outstanding and 430 shares of Series X Convertible Preferred Stock outstanding.

Common Stock

We may issue shares of our common stock from time to time. Holders of our common stock are entitled to one vote per share for the election of directors and on all other matters that require stockholder approval. Subject to any preferential rights of any outstanding preferred stock, in the event of our liquidation, dissolution or winding up, holders of our common stock are entitled to share ratably in the assets remaining after payment of liabilities and the liquidation preferences of any outstanding preferred stock. Our common stock does not carry any redemption rights or any preemptive rights enabling a holder to subscribe for, or receive shares of, any class of our common stock or any other securities convertible into shares of any class of our common stock.

No shares of common stock or warrants exercisable into common stock shall be issued at the Second Closing pursuant to the Securities Purchase Agreement until the Company has complied with NASDAQ Rule 5635(d) which requires prior stockholder approval for the issuance, other than in a public offering, of common stock (or securities convertible into common stock) equal to 20% or more of the common stock or 20% or more of the voting power outstanding before the issuance for less than the greater of book or market value of the stock. Upon receiving the requisite stockholder approval pursuant to NASDAQ Rule 5635(d), the Company will take such necessary steps to effect the Second Closing pursuant to the Securities Purchase Agreement.

Exchange Listing

Our common stock is listed on The NASDAQ Global Market under the symbol "ANTH." On November 9, 2017, the closing price for our common stock, as reported on The NASDAQ Global Market, was \$1.86 per share.

Transfer Agent and Registrar

The transfer agent and registrar for our common stock is American Stock Transfer & Trust Company, LLC. The transfer agent and registrar's address is 6201 15th Avenue, Brooklyn, NY 11219.

Preferred Stock

Our board of directors is authorized to issue up to 5,000,000 shares of undesignated preferred stock in one or more series without stockholder approval. As a result of the designation of 17,000 shares of Series X Convertible Preferred Stock, 28,330 shares of Series X-1 Convertible Preferred Stock and 2,067,522 shares of Class Y Preferred Stock as described below, our board of directors is authorized to designate and issue up to 2,887,148 remaining shares of preferred stock. Our board of directors may fix the rights, conversion rights, voting rights, rights and terms of purchase or redemption, liquidation preference and sinking fund terms, any or all of which may be greater than the rights of the common stock. The issuance of our preferred stock could adversely affect the voting power of holders of common stock and the likelihood that such holders will receive dividend payments and payments upon our liquidation. In addition, the issuance of preferred stock could have the effect of delaying, deferring or preventing a change in control of our company or other corporate action.

We filed an Amended and Restated Certificate of Designation of Preferences, Rights and Limitations of Series X Convertible Preferred Stock with the Secretary of State of Delaware on September 15, 2017, pursuant to which we designated 17,000 shares of authorized and unissued preferred stock as Series X Convertible Preferred Stock (the “Series X Preferred Shares”). We filed a Certificate of Designation of Preferences, Rights and Limitations of Series X-1 Convertible Preferred Stock with the Secretary of State of Delaware on September 12, 2017, pursuant to which we designated 28,330 shares of authorized and unissued preferred stock as Series X-1 Convertible Preferred Stock (the “Series X-1 Preferred Shares”). We filed a Certificate of Designation of Preferences, Rights and Limitations of Class Y Preferred Stock with the Secretary of State of Delaware on October 25, 2017, pursuant to which we designated 2,067,522 shares of authorized and unissued preferred stock as Class Y Preferred Stock. Each Series X Preferred Share is convertible into 63.47 shares of common stock (subject to adjustment for stock dividends, stock splits, combinations and the like) and each Class Y Preferred Stock is convertible into one (1) share of Common Stock (subject to adjustment for stock dividends, stock splits, combinations and the like).

The Company shall not effect any conversion of the Class Y Preferred Stock, and no purchaser under the Securities Purchase Agreement shall have the right to convert, and shall be deemed not to have converted, any portion of the Class Y Preferred Stock, to the extent that, after giving effect to an attempted conversion such holder would beneficially own a number of shares of Common Stock in excess of 4.99% of the number of shares of common stock outstanding immediately after giving effect to the issuance of shares of common stock pursuant to such notice of conversion. The Company shall not effect any conversion of the Series X Preferred Shares or Series X-1 Preferred Shares, and such holder shall not have the right to convert, and shall be deemed not to have converted, any portion of the Series X Preferred Shares or Series X-1 Preferred Shares, to the extent that, after giving effect to an attempted conversion such holder would beneficially own a number of shares of Common Stock in excess of 9.99% of the number of shares of common stock outstanding immediately after giving effect to the issuance of shares of common stock pursuant to such notice of conversion.

No Class Y Preferred Stock shall be issued until we have complied with NASDAQ Rule 5635(d) which requires prior stockholder approval for the issuance, other than in a public offering, of common stock (or securities convertible into common stock) equal to 20% or more of the common stock or 20% or more of the voting power outstanding before the issuance for less than the greater of book or market value of the stock. Upon receiving the requisite stockholder approval pursuant to NASDAQ Rule 5635(d), the Company will take such necessary steps to effect the Second Closing pursuant to the Securities Purchase Agreement.

In the event of our liquidation, dissolution or winding up, holders of Preferred Stock will participate *pari passu* with the holders of our common stock in any distribution of proceeds, pro rata based on the number of shares held by each such holder on an as-converted basis. The Preferred Stock have no voting rights. Holders of

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the Preferred Stock are entitled to receive, on an as-converted-to-Common-Stock basis, dividends that are equal to dividends actually paid on shares of Common Stock, when, as and if such dividends are paid on shares of the Common Stock.

Provisions of our Certificate of Incorporation and Bylaws and Delaware Anti-Takeover Law

Certain provisions of the Delaware General Corporation Law and of our certificate of incorporation and bylaws could have the effect of delaying, deferring or discouraging another party from acquiring control of us. These provisions, which are summarized below, are expected to discourage certain types of coercive takeover practices and inadequate takeover bids and, as a consequence, they might also inhibit temporary fluctuations in the market price of our common stock that often result from actual or rumored hostile takeover attempts. These provisions are also designed in part to encourage anyone seeking to acquire control of us to first negotiate with our board of directors. These provisions might also have the effect of preventing changes in our management. It is possible that these provisions could make it more difficult to accomplish transactions that stockholders might otherwise deem to be in their best interests. However, we believe that the advantages gained by protecting our ability to negotiate with any unsolicited and potentially unfriendly acquirer outweigh the disadvantages of discouraging such proposals, including those priced above the then-current market value of our common stock, because, among other reasons, the negotiation of such proposals could improve their terms.

Board Composition and Filling Vacancies

Our certificate of incorporation provides for the division of our board of directors into three classes serving staggered three-year terms, with one class being elected each year. Our certificate of incorporation also provides that directors may be removed only for cause and then only by the affirmative vote of the holders of 75% or more of the shares then entitled to vote at an election of directors. Furthermore, any vacancy on our board of directors, however occurring, including a vacancy resulting from an increase in the size of our board, may only be filled by the affirmative vote of a majority of our directors then in office even if less than a quorum.

No Written Consent of Stockholders

Our certificate of incorporation provides that all stockholder actions are required to be taken by a vote of the stockholders at an annual or special meeting, and that stockholders may not take any action by written consent in lieu of a meeting.

Meetings of Stockholders

Our certificate of incorporation and bylaws provide that only a majority of the members of our board of directors then in office may call special meetings of stockholders and only those matters set forth in the notice of the special meeting may be considered or acted upon at a special meeting of stockholders. Our bylaws limit the business that may be conducted at an annual meeting of stockholders to those matters properly brought before the meeting.

Advance Notice Requirements

Our bylaws establish advance notice procedures with regard to stockholder proposals relating to the nomination of candidates for election as directors or new business to be brought before meetings of our stockholders. These procedures provide that notice of stockholder proposals must be timely given in writing to our corporate secretary prior to the meeting at which the action is to be taken. Generally, to be timely, notice must be received at our principal executive offices not less than 90 days nor more than 120 days prior to the first anniversary date of the annual meeting for the preceding year. Our bylaws specify the requirements as to form and content of all stockholders' notices.

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Amendment to Certificate of Incorporation and Bylaws

Any amendment of our certificate of incorporation must be approved by a majority of the outstanding shares entitled to vote on the amendment and a majority of the outstanding shares of each class entitled to vote thereon as a class, except that the amendment of the provisions relating to stockholder action, board composition, limitation of liability and the amendment of our certificate of incorporation must be approved by not less than 75% of the outstanding shares entitled to vote on the amendment, and not less than 75% of the outstanding shares of each class entitled to vote thereon as a class. Our bylaws may be amended by the affirmative vote of a majority of the directors then in office, subject to any limitations set forth in the bylaws; and may also be amended by the affirmative vote of at least 75% of the outstanding shares entitled to vote on the amendment, or, if our board of directors recommends that the stockholders approve the amendment, by the affirmative vote of the majority of the outstanding shares entitled to vote on the amendment, in each case voting together as a single class.

Undesignated Preferred Stock.

Our certificate of incorporation provides for 5,000,000 authorized shares of preferred stock, of which 2,112,852 shares have been designated as Series X Preferred Shares, Series X-1 Preferred Shares or Class Y Preferred Stock. The existence of authorized but unissued shares of undesignated preferred stock may enable our board of directors to discourage an attempt to obtain control of us by means of a merger, tender offer, proxy contest or otherwise. For example, if in the due exercise of its fiduciary obligations, our board of directors were to determine that a takeover proposal is not in the best interests of our stockholders, our board of directors could cause shares of preferred stock to be issued without stockholder approval in one or more private offerings or other transactions that might dilute the voting or other rights of the proposed acquirer or insurgent stockholder or stockholder group. In this regard, our certificate of incorporation grants our board of directors broad power to establish the rights and preferences of authorized and unissued shares of preferred stock. The issuance of shares of undesignated preferred stock could decrease the amount of earnings and assets available for distribution to holders of shares of common stock. The issuance may also adversely affect the rights and powers, including voting rights, of these holders and may have the effect of delaying, deterring or preventing a change in control of us.

Delaware Anti-Takeover Law

We are subject to the provisions of Section 203 of the Delaware General Corporation Law. In general, Section 203 prohibits a publicly-held Delaware corporation from engaging in a “business combination” with an “interested stockholder” for a three-year period following the time that this stockholder becomes an interested stockholder, unless the business combination is approved in a prescribed manner. A “business combination” includes, among other things, a merger, asset or stock sale or other transaction resulting in a financial benefit to the interested stockholder. In general, Section 203 defines an “interested stockholder” as any person or entity who, together with affiliates and associates, owns, or did own within three years prior to the determination of interested stockholder status, 15% or more of the corporation’s voting stock. Under Section 203, a business combination between a corporation and an interested stockholder is prohibited unless it satisfies one of the following conditions:

- before the stockholder became interested, the board of directors approved either the business combination or the transaction which resulted in the stockholder becoming an interested stockholder;
- upon consummation of the transaction which resulted in the stockholder becoming an interested stockholder, the interested stockholder owned at least 85% of the voting stock of the corporation outstanding at the time the transaction commenced, excluding for purposes of determining the voting stock outstanding, shares owned by persons who are directors and also officers, and employee stock plans, in some instances; or

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- at or after the time the stockholder became interested, the business combination was approved by the board of directors of the corporation and authorized at an annual or special meeting of the stockholders by the affirmative vote of at least two-thirds of the outstanding voting stock which is not owned by the interested stockholder.

Exclusive Jurisdiction of Certain Actions

Our bylaws provides that, unless we consent in writing to the selection of an alternative forum, the Court of Chancery of the State of Delaware shall be the sole and exclusive forum for (i) any derivative action or proceeding brought on behalf of the Corporation, (ii) any action asserting a claim of breach of a fiduciary duty owed by any director, officer or other employee of the Corporation to the Corporation or the Corporation's stockholders, (iii) any action asserting a claim arising pursuant to any provision of the Delaware General Corporation Law or the Certificate or Bylaws, or (iv) any action asserting a claim against the Corporation governed by the internal affairs doctrine.

Registration Rights

In connection with the private placement described below in the section entitled "Selling Stockholders," on October 23, 2017, we also entered into a registration rights agreement (the "Registration Rights Agreement") with each holder thereto, requiring us to register the resale of (i) the common stock issued at the Initial Closing and to be issued at the Second Closing, (ii) the shares of common stock issuable upon exercise of the warrants issued in the Initial Closing and to be issued at the Second Closing, and (iii) the shares of common stock issuable upon the conversion of the preferred stock to be issued at the Second Closing. We are required to prepare and file a registration statement with the SEC within fifteen (15) calendar days following the Initial Closing. We are required to use commercially reasonable efforts to have the registration statement declared effective within fifty (50) calendar days following the Initial Closing if there is no review by the SEC and by January 9, 2018 in the event of such review. If We are notified by the SEC that the registration statement is not subject to review or the SEC has no further comments, the effectiveness deadline is five (5) trading days from such notification.

We are required to use commercially reasonable efforts to cause such registration statement to become effective as soon as possible and to remain continuously effective for a period that will terminate upon the earlier of (i) such time as all of the registrable securities covered by such registration statement have been publicly sold by the holders or (ii) the date on which the holders cease to hold registrable securities.

SELLING STOCKHOLDERS

We have prepared this prospectus to allow the selling stockholders to sell or otherwise dispose of, from time to time, up to 28,613,474 shares of our common stock.

On October 23, 2017, we entered into the Securities Purchase Agreement for a private placement (the “Private Placement”) with a select group of accredited investors (the “Purchasers”). The Private Placement is expected to have two closings.

Pursuant to the Securities Purchase Agreement, at the initial closing that occurred on October 27, 2017 (the “Initial Closing”), Purchasers purchased 2,306,737 shares of the Company’s Common Stock, at \$1.25 per share. Each share of common stock was issued with a warrant to purchase 3.0 additional shares of the Company’s common stock at an exercise price of \$1.55 per share. The total number of warrants to purchase common stock issued at the Initial Closing was 6,920,211 (the “Initial Closing Warrants” and the shares of common stock issuable upon exercise of or otherwise pursuant to the Initial Closing Warrants collectively are referred to herein as the “Initial Closing Warrant Shares”). The Initial Closing Warrants will become exercisable on the six month and one day anniversary of the Initial Closing and will have a term of five years and six months.

The Company expects that the aggregate number of voting securities to be sold at the Initial Closing and at the second closing (the “Second Closing”) of the Private Placement shall constitute the sale, issuance or potential issuance by the Company of common stock (or securities convertible into or exercisable into common stock) equal to 20% or more of the voting power outstanding before the Private Placement in contravention of Nasdaq Rule 5635(d) (2). Therefore, after the Initial Closing, the Company will solicit approval from holders of a majority of the then outstanding shares of the Company immediately prior to the issuance of the securities in connection with a second closing (the “Stockholder Approval”) and such Second Closing is contingent upon receiving such Stockholder Approval.

At the Second Closing, the Purchasers are expected to purchase 7,625,741 shares of the Company’s Common Stock, at \$1.25 per share and 2,067,522 shares of the Company’s non-voting Class Y Preferred Stock, at \$1.25 per share, convertible into 2,067,522 shares of Company Common Stock upon certain conditions. Each share of Common Stock or Class Y Preferred Stock will be issued with a warrant that is immediately exercisable to purchase 1.0 additional share of the Company’s Common Stock at an exercise price of \$1.25 per share. The expected total number of warrants to purchase Common Stock to be issued at the Second Closing is 9,693,263 (the “Second Closing Warrants” and the shares of Common Stock issuable upon exercise of or otherwise pursuant to the Second Closing Warrants collectively are referred to herein as the “Second Closing Warrant Shares”). The Second Closing Warrants will have a term of five years from their date of issuance.

When we refer to “selling stockholders” in this prospectus, we mean the stockholders listed in the table below and their pledgees, donees, transferees or other successors in interest.

Pursuant to the Registration Rights Agreement, we agreed to prepare and file a registration statement on Form S-3 within 15 calendar days following the Initial Closing to provide for the resale of the issued shares of the selling stockholders. This prospectus is a part of the registration statement filed pursuant to that obligation. The table below lists the names of the selling stockholders and other information regarding the beneficial ownership of the shares of common stock held by each of the selling stockholders, including the nature of any position, office or other material relationship, if any, that the selling stockholder (or the individuals or entities who have control over such selling stockholders) has had within the past three years with us or with any of our predecessors or affiliates. The first column lists the number of shares of common stock beneficially owned by each selling stockholder, based on its ownership as of October 23, 2017 and the shares of our common stock issued (or issuable) pursuant to the Securities Purchase Agreement, as such beneficial ownership is determined in accordance with the rules of the SEC. The second column lists the shares of common stock being offered by this

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prospectus by each selling stockholder. The third and fourth columns assume the sale of all of the shares offered by the selling stockholders pursuant to this prospectus.

Beneficial ownership is determined in accordance with rules promulgated by the SEC, and the information is not necessarily indicative of beneficial ownership for any other purpose. This table is based upon information supplied to us by the selling stockholders and information filed with the SEC.

Information about the selling stockholders may change over time. Any changed information will be set forth in supplements to this prospectus to the extent required.

Name and Address of Selling Stockholder	Number of Shares Beneficially Owned Prior to the Offering(1)	Number of Shares Registered for Sale(2)	Number of Shares Beneficially Owned After the Offering(3)	Percent of Class Beneficially Owned After the Offering(3)
Sabby Volatility Warrant Master Fund, Ltd. c/o Sabby Management 10 Mountainview Road—Ste 205 Upper Saddle River, NJ 07458	4,366,542 (4)	3,882,082 (5)	484,460 (6)	3.38%
Entities affiliated with Empery Asset Master, LTD c/o Empery Asset Management, LP One Rockefeller Plaza, Suite 1205 New York, NY 10020	2,384,454 (7)	2,384,454 (8)	0	*
CVI Investments, Inc. Heights Capital Management 101 California Street, Suite 3250 San Francisco, CA 94111	2,384,456 (9)	2,384,456 (10)	0	*
Lincoln Park Capital Fund, LLC Lincoln Park Capital, LLC 440 N. Wells St., Suite 410 Chicago, IL 60654	953,782 (11)	953,782 (12)	0	*
Entities affiliated with Sio Partners, LP Sio Capital Management, LLC 535 Fifth Avenue, Suite 910 New York, NY 10017	286,134 (13)	286,134 (14)	0	*
683 Capital Partners, LP 3 Columbus Circle, Ste. 2205 New York, NY 10019	3,433,618 (15)	3,433,618 (16)	0	*
Entities affiliated with AIGH Investment Partners LP 6006 Berkeley Avenue Baltimore, MD 21209	1,526,052 (17)	1,526,052 (18)	0	*
Birchview Fund LLC c/o Birchview Capital, LP 688 Pine Street, Suite 2D Burlington, VT 05401	190,756 (19)	190,756 (20)	0	*
Entities affiliated with Biotechnology Value Fund, L.P. 1 Sansome Street, 30th Floor San Francisco, CA 94104	4,948,610 (21)	2,603,636 (22)	2,344,974 (23)	15.44%
Armistice Capital Master Fund Ltd. c/o Armistice Capital, LLC 510 Madison Ave, 22nd Floor New York, NY 10022	9,537,830 (24)	9,537,830 (25)	0	*

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Name and Address of Selling Stockholder	Number of Shares Beneficially Owned Prior to the Offering(1)	Number of Shares Registered for Sale(2)	Number of Shares Beneficially Owned After the Offering(3)	Percent of Class Beneficially Owned After the Offering(3)
Entities affiliated with Alyeska Master Fund, L.P. PO Box 309, Ugland House Grand Cayman, KY1-1104 Cayman Islands	1,430,674 (26)	1,430,674 (27)	0	*

- (1) This includes (i) the shares of common stock beneficially owned prior to this offering, (ii) the shares of common stock issued at the Initial Closing, (iii) the Initial Closing Warrant Shares issued at the Initial Closing, (iv) the share of common stock to be issued at the Second Closing, (v) the shares of common stock issuable upon conversion of the Class Y Preferred Stock and (vi) the Second Closing Warrant Shares. For the purpose of this table only, the Initial Closing Warrant Shares issuable upon exercise of the Initial Closing Warrants and the Second Closing Warrant Shares issuable upon exercise of the Second Closing Warrants are included in this column as if such Initial Closing Warrants and Second Closing Warrants were exercisable within 60 days.
- (2) This includes (i) the shares of common stock issued at the Initial Closing, (ii) the Initial Closing Warrant Shares issued at the Initial Closing, (iii) the share of common stock to be issued at the Second Closing, (iv) the shares of common stock issuable upon conversion of the Class Y Preferred Stock and (v) the Second Closing Warrant Shares. For the purpose of this table only, the Initial Closing Warrant Shares issuable upon exercise of the Initial Closing Warrants and the Second Closing Warrant Shares issuable upon exercise of the Second Closing Warrants are included in this column as if such Initial Closing Warrants and Second Closing Warrants were exercisable within 60 days.
- (3) We do not know when or in what amounts the selling stockholders will offer shares for sale, if at all. The selling stockholders may sell any or all of the shares included in and offered by this prospectus. Because the selling stockholders may offer all or some of the shares pursuant to this offering, we cannot estimate the number of shares that will be held by the selling stockholders after completion of the offering. However, for purposes of this table, we have assumed that after completion of the offering, none of the shares included in and covered by this prospectus will be held by the selling stockholders. The percent of beneficial ownership for the selling stockholders after the offering is based on 13,849,678 shares of our common stock outstanding as of October 31, 2017. Based on Rule 13d-3(d)(i) under the Securities Exchange Act of 1934, the number of shares of common stock outstanding used in calculating the percentage for each selling securityholder includes common stock underlying a warrant held by the selling securityholder, but excludes common stock underlying warrants held by any other selling securityholder.
- (4) Includes (A) 484,460 warrants to purchase shares of common stock held by Sabby Volatility Warrant Master Fund, Ltd., 234,460 warrants of which expired on October 28, 2017 and (B) the shares of common stock issued or issuable described in footnote (5) below, subject to the beneficial ownership limitations set forth in the warrant to purchase common stock held by Sabby Volatility Warrant Master Fund, Ltd. (such limitations prohibiting any exercise that would cause such holder to hold in excess of 4.99% of our then issued and outstanding shares of common stock).
- (5) Includes (i) 312,963 shares of common stock issued at the Initial Closing, (ii) 938,889 Initial Closing Warrant Shares, (iii) 1,315,115 shares of common stock to be issued at the Second Closing, and (iv) 1,315,115 Second Closing Warrant Shares.
- (6) Includes 234,460 warrants that expired on October 28, 2017.
- (7) Includes (i) the shares of common stock issued or issuable described in footnote (8) below, subject to the beneficial ownership limitations set forth in the warrant to purchase common stock held by Empery Asset Master, LTD (such limitations prohibiting any exercise that would cause such holder to hold in excess of 4.99% of our then issued and outstanding shares of common stock), (ii) the shares of common stock issued or issuable described in footnote (8) below, subject to the beneficial ownership limitations set forth in the warrant to purchase common stock held by Empery Tax Efficient, LP (such limitations prohibiting any exercise that would cause such holder to hold in excess of 4.99% of our then issued and outstanding shares of common stock), and (iii) the shares of common stock issued or issuable described in footnote (8) below, subject to the beneficial ownership limitations set forth in the warrant to purchase common stock held by Empery Tax Efficient II, LP (such limitations prohibiting any exercise that would cause such holder to hold in excess of 4.99% of our then issued and outstanding shares of common stock). Empery Asset Management LP, the authorized agent of Empery Asset Master Ltd ("EAM"), has discretionary authority to vote and dispose of the shares held by EAM and may be deemed to be the beneficial owner of these shares. Martin Hoe and Ryan Lane, in their capacity as investment managers of Empery Asset Management LP, may also be deemed to have

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investment discretion and voting power over the shares held by EAM. EAM, Mr. Hoe and Mr. Lane each disclaim any beneficial ownership of these shares. Empery Asset Management LP, the authorized agent of Empery Tax Efficient, LP (“ETE”), has discretionary authority to vote and dispose of the shares held by ETE and may be deemed to be the beneficial owner of these shares. Martin Hoe and Ryan Lane, in their capacity as investment managers of Empery Asset Management LP, may also be deemed to have investment discretion and voting power over the shares held by ETE. ETE, Mr. Hoe and Mr. Lane each disclaim any beneficial ownership of these shares. Empery Asset Management LP, the authorized agent of Empery Tax Efficient II, LP (“ETE II”), has discretionary authority to vote and dispose of the shares held by ETE II and may be deemed to be the beneficial owner of these shares. Martin Hoe and Ryan Lane, in their capacity as investment managers of Empery Asset Management LP, may also be deemed to have investment discretion and voting power over the shares held by ETE II. ETE II, Mr. Hoe and Mr. Lane each disclaim any beneficial ownership of these shares.

- (8) Includes (A)(i) 67,260 shares of common stock held by Empery Asset Master, LTD issued at the Initial Closing, (ii) 42,040 shares of common stock held by Empery Tax Efficient, LP issued at the Initial Closing and (iii) 82,927 shares of common stock held by Empery Tax Efficient II, LP issued at the Initial Closing, (B)(i) 201,780 Initial Closing Warrant Shares held by Empery Asset Master, LTD, (ii) 126,120 Initial Closing Warrant Shares held by Empery Tax Efficient, LP and (iii) 248,781 Initial Closing Warrant Shares held by Empery Tax Efficient II, LP, (C)(i) 282,640 shares of common stock to be issued to Empery Asset Master, LTD at the Second Closing, (ii) 176,660 shares of common stock to be issued to Empery Tax Efficient, LP at the Second Closing and (iii) 348,473 shares of common stock to be issued to Empery Tax Efficient II, LP at the Second Closing, and (D)(i) 282,640 Second Closing Warrant Shares issuable upon exercise of the Second Closing Warrants to be issued to Empery Asset Master, LTD, (ii) 176,660 Second Closing Warrant Shares issuable upon exercise of the Second Closing Warrants to be issued to Empery Tax Efficient, LP and (iii) 348,473 Second Closing Warrant Shares issuable upon exercise of the Second Closing Warrants to be issued to Empery Tax Efficient II, LP.
- (9) Includes the shares of common stock issued or issuable described in footnote (10) below, subject to the beneficial ownership limitations set forth in the warrant to purchase common stock held by CVI Investments, Inc. (such limitations prohibiting any exercise that would cause such holder to hold in excess of 4.99% of our then issued and outstanding shares of common stock).
- (10) Includes (i) 192,228 shares of common stock issued at the Initial Closing, (ii) 576,684 Initial Closing Warrant Shares, (iii) 807,772 shares of common stock to be issued at the Second Closing, and (iv) 807,772 Second Closing Warrant Shares.
- (11) Includes the shares of common stock issued or issuable described in footnote (12) below, subject to the beneficial ownership limitations set forth in the warrant to purchase common stock held by Lincoln Park Capital Fund, LLC (such limitations prohibiting any exercise that would cause such holder to hold in excess of 4.99% of our then issued and outstanding shares of common stock).
- (12) Includes (i) 76,891 shares of common stock issued at the Initial Closing, (ii) 230,673 Initial Closing Warrant Shares, (iii) 323,109 shares of common stock to be issued at the Second Closing, and (iv) 323,109 Second Closing Warrant Shares.
- (13) Includes (i) the shares of common stock issued or issuable described in footnote (14) below, subject to the beneficial ownership limitations set forth in the warrant to purchase common stock held by Sio Partners LP (such limitations prohibiting any exercise that would cause such holder to hold in excess of 4.99% of our then issued and outstanding shares of common stock), (ii) the shares of common stock issued or issuable described in footnote (14) below, subject to the beneficial ownership limitations set forth in the warrant to purchase common stock held by Sio Partners Master Fund LP (such limitations prohibiting any exercise that would cause such holder to hold in excess of 4.99% of our then issued and outstanding shares of common stock), (iii) the shares of common stock issued or issuable described in footnote (14) below, subject to the beneficial ownership limitations set forth in the warrant to purchase common stock held by Compass MAV LLC (such limitations prohibiting any exercise that would cause such holder to hold in excess of 4.99% of our then issued and outstanding shares of common stock), and (iv) the shares of common stock issued or issuable described in footnote (14) below, subject to the beneficial ownership limitations set forth in the warrant to purchase common stock held by Compass Offshore MAV Limited (such limitations prohibiting any exercise that would cause such holder to hold in excess of 4.99% of our then issued and outstanding shares of common stock).
- (14) Includes (A)(i) 6,940 shares of common stock held by Sio Partners LP issued at the Initial Closing, (ii) 5,090 shares of common stock held by Sio Partners Master Fund LP issued at the Initial Closing, (iii) 7,249 shares of common stock held by Compass MAV LLC issued at the Initial Closing and (iv) 3,788 shares of common stock held by Compass Offshore MAV Limited issued at the Initial Closing, (B)(i) 20,820 Initial Closing Warrant Shares held by Sio Partners LP, (ii) 15,270 Initial Closing Warrant Shares held by Sio Partners Master Fund LP, (iii) 21,747 Initial Closing Warrant Shares held by Compass MAV LLC and (iv) 11,364 Initial Closing Warrant Shares held by Compass Offshore MAV

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- Limited, (C)(i) 29,164 shares of common stock to be issued to Sio Partners LP at the Second Closing, (ii) 21,387 shares of common stock to be issued to Sio Partners Master Fund LP at the Second Closing, (iii) 30,464 shares of common stock to be issued to Compass MAV LLC at the Second Closing and (iv) 15,918 shares of common stock to be issued to Compass Offshore MAV Limited at the Second Closing and (D)(i) 29,164 Second Closing Warrant Shares issuable upon exercise of the Second Closing Warrants to be issued to Sio Partners LP, (ii) 21,387 Second Closing Warrant Shares issuable upon exercise of the Second Closing Warrants to be issued to Sio Partners Master Fund LP, (iii) 30,464 Second Closing Warrant Shares issuable upon exercise of the Second Closing Warrants to be issued to Compass MAV LLC and (iv) 15,918 Second Closing Warrant Shares issuable upon exercise of the Second Closing Warrants to be issued to Compass Offshore MAV Limited.
- (15) Includes the shares of common stock issued or issuable described in footnote (16) below, subject to the beneficial ownership limitations set forth in the warrant to purchase common stock held by 683 Capital Partners, LP (such limitations prohibiting any exercise that would cause such holder to hold in excess of 4.99% of our then issued and outstanding shares of common stock).
- (16) Includes (i) 276,809 shares of common stock issued at the Initial Closing, (ii) 830,427 Initial Closing Warrant Shares, (iii) 1,163,191 shares of common stock to be issued at the Second Closing, and (iv) 1,163,191 Second Closing Warrant Shares.
- (17) Includes (i) the shares of common stock issued or issuable described in footnote (18) below, subject to the beneficial ownership limitations set forth in the warrant to purchase common stock held by AIGH Investment Partners LP (such limitations prohibiting any exercise that would cause such holder to hold in excess of 4.99% of our then issued and outstanding shares of common stock) and (ii) the shares of common stock issued or issuable described in footnote (18) below, subject to the beneficial ownership limitations set forth in the warrant to purchase common stock held by AIGH Investment Partners LLC (such limitations prohibiting any exercise that would cause such holder to hold in excess of 4.99% of our then issued and outstanding shares of common stock).
- (18) Includes (A)(i) 115,337 shares of common stock held by AIGH Investment Partners LP issued at the Initial Closing and (ii) 7,689 shares of common stock held by AIGH Investment Partners LLC issued at the Initial Closing, (B) 346,011 Initial Closing Warrant Shares held by AIGH Investment Partners LP and (ii) 23,067 Initial Closing Warrant Shares held by AIGH Investment Partners LLC, (C)(i) 484,663 shares of common stock to be issued to AIGH Investment Partners LP at the Second Closing and (ii) 32,311 shares of common stock to be issued to AIGH Investment Partners LLC at the Second Closing, and (D) 484,663 Second Closing Warrant Shares issuable upon exercise of the Second Closing Warrants to be issued to AIGH Investment Partners LP and (ii) 32,311 Second Closing Warrant Shares issuable upon exercise of the Second Closing Warrants to be issued to AIGH Investment Partners LLC.
- (19) Includes the shares of common stock issued or issuable described in footnote (20) below, subject to the beneficial ownership limitations set forth in the warrant to purchase common stock held by Birchview Fund LLC (such limitations prohibiting any exercise that would cause such holder to hold in excess of 4.99% of our then issued and outstanding shares of common stock).
- (20) Includes (i) 15,378 shares of common stock issued at the Initial Closing, (ii) 46,134 Initial Closing Warrant Shares, (iii) 64,622 shares of common stock to be issued at the Second Closing, and (iv) 64,622 Second Closing Warrant Shares.
- (21) Includes (A)(i) 460,647 shares of common stock held by Biotechnology Value Fund, L.P., 301,209 shares of common stock held by Biotechnology Value Fund II, L.P., 83,804 shares of common stock held by Biotechnology Value Trading Fund OS, L.P., 51,458 shares of common stock held by Investment 10, LLC, and 109,389 shares of common stock held by MSI BVF SPV, LLC and (ii) 199 shares of Series X Convertible Preferred Stock held by Biotechnology Value Fund, L.P., 130 shares of Series X Convertible Preferred Stock held by Biotechnology Value Fund II, L.P., 39 shares of Series X Convertible Preferred Stock held by Biotechnology Value Trading Fund OS, L.P., and 62 shares of Series X Convertible Preferred Stock held by MSI BVF SPV, LLP and (iii) 608,324 warrants to purchase common stock held by Biotechnology Value Fund, L.P., 249,024 warrants of which expired on October 28, 2017, 397,880 warrants to purchase common stock held by Biotechnology Value Fund II, L.P., 162,901 warrants of which expired on October 28, 2017, 106,759 warrants to purchase common stock held by Biotechnology Value Trading Fund OS, L.P., 42,652 warrants of which expired on October 28, 2017, 102,916 warrants to purchase common stock held by Investment 10, LLC, 51,458 warrants of which expired on October 28, 2017, and 122,158 warrants to purchase common stock held by MSI BVF SPV, LLC, 43,964 warrants of which expired on October 28, 2017 and (B)(i) the shares of common stock issued or issuable described in footnote (22) below, subject to the beneficial ownership limitations set forth in the warrant to purchase common stock held by Biotechnology Value Fund, L.P., (such limitations prohibiting any exercise that would cause such holder to hold in excess of 9.99% of our then issued and outstanding shares of common stock) (ii) the shares of common stock issued or issuable described in footnote (22) below, subject to the beneficial ownership limitations set forth in the warrant to purchase common stock held by Biotechnology Value Fund II, L.P.

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- (such limitations prohibiting any exercise that would cause such holder to hold in excess of 9.99% of our then issued and outstanding shares of common stock), (iii) the shares of common stock issued or issuable described in footnote (22) below, subject to the beneficial ownership limitations set forth in the warrant to purchase common stock held by Biotechnology Value Trading Fund OS, L.P., (such limitations prohibiting any exercise that would cause such holder to hold in excess of 9.99% of our then issued and outstanding shares of common stock), (iv) the shares of common stock issued or issuable described in footnote (22) below, subject to the beneficial ownership limitations set forth in the warrant to purchase common stock held by Investment 10, LLC (such limitations prohibiting any exercise that would cause such holder to hold in excess of 9.99% of our then issued and outstanding shares of common stock), and (v) the shares of common stock issued or issuable described in footnote (22) below, subject to the beneficial ownership limitations set forth in the warrant to purchase common stock held by MSI BVF SPV, LLC (such limitations prohibiting any exercise that would cause such holder to hold in excess of 9.99% of our then issued and outstanding shares of common stock).
- (22) Includes (A)(i) 100,487 shares of common stock held by Biotechnology Value Fund, L.P. issued at the Initial Closing, (ii) 68,039 shares of common stock held by Biotechnology Value Fund II, L.P. issued at the Initial Closing, (iii) 17,918 shares of common stock held by Biotechnology Value Trading Fund OS, L.P. issued at the Initial Closing, (iv) 10,631 shares of common stock held by Investment 10, LLC issued at the Initial Closing and (v) 12,821 shares of common stock held by MSI BVF SPV, LLC issued at the Initial Closing and (B)(i) 301,461 Initial Closing Warrant Shares held by Biotechnology Value Fund, L.P., (ii) 204,117 Initial Closing Warrant Shares held by Biotechnology Value Fund II, L.P., (iii) 53,754 Initial Closing Warrant Shares held by Biotechnology Value Trading Fund OS, L.P., (iv) 31,893 Initial Closing Warrant Shares held by Investment 10, LLC and (v) 38,463 Initial Closing Warrant Shares held by MSI BVF SPV, LLC, (C)(i) 422,263 shares of common stock to be issued to Biotechnology Value Fund, L.P. at the Second Closing, (ii) 285,911 shares of common stock to be issued to Biotechnology Value Fund II, L.P. at the Second Closing, (iii) 75,296 shares of common stock to be issued to Biotechnology Value Trading Fund OS, L.P. at the Second Closing, (iv) 44,677 shares of common stock to be issued to Investment 10, LLC at the Second Closing and (v) 53,879 shares of common stock to be issued to MSI BVF SPV, LLC at the Second Closing and (D)(i) 422,263 Second Closing Warrant Shares issuable upon exercise of the Second Closing Warrants to be issued to Biotechnology Value Fund, L.P., (ii) 285,911 Second Closing Warrant Shares issuable upon exercise of the Second Closing Warrants to be issued to Biotechnology Value Fund II, L.P., (iii) 75,296 Second Closing Warrant Shares issuable upon exercise of the Second Closing Warrants to be issued to Biotechnology Value Trading Fund OS, L.P., (iv) 44,677 Second Closing Warrant Shares issuable upon exercise of the Second Closing Warrants to be issued to Investment 10, LLC and (v) 53,879 Second Closing Warrant Shares issuable upon exercise of the Second Closing Warrants to be issued to MSI BVF SPV, LLC.
- (23) Includes 549,999 warrants that expired on October 28, 2017.
- (24) Includes the shares of common stock issued and issuable described in footnote (25) below, subject to the beneficial ownership limitations set forth in the warrant to purchase common stock held by Armistice Capital Master Fund Ltd. (such limitations prohibiting any exercise that would cause such holder to hold in excess of 4.99% of our then issued and outstanding shares of common stock).
- (25) Includes (i) 768,915 shares of common stock, (ii) 2,306,745 Initial Closing Warrant Shares, (iii) 1,163,563 shares of common stock to be issued at the Second Closing, (iv) 1,163,563 Second Closing Warrant Shares, and (v) 2,067,522 shares of common stock issuable upon conversion of the Class Y Preferred Stock to be issued at the Second Closing.
- (26) Includes (i) the shares of common stock issued and issuable described in footnote (27) below, subject to the beneficial ownership limitations set forth in the warrant to purchase common stock held by Alyeska Master Fund, L.P. (such limitations prohibiting any exercise that would cause such holder to hold in excess of 4.99% of our then issued and outstanding shares of common stock) and (ii) the shares of common stock issued and issuable described in footnote (27) below, subject to the beneficial ownership limitations set forth in the warrant to purchase common stock held by Alyeska Master Fund 2, L.P. (such limitations prohibiting any exercise that would cause such holder to hold in excess of 4.99% of our then issued and outstanding shares of common stock).
- (27) Includes (A)(i) 68,653 shares of common stock held by Alyeska Master Fund, L.P. issued at the Initial Closing and (ii) 46,684 shares of common stock held by Alyeska Master Fund 2, L.P. issued at the Initial Closing, (B)(i) 205,959 Initial Closing Warrant Shares held by Alyeska Master Fund, L.P. and (ii) 140,052 Initial Closing Warrant Shares held by Alyeska Master Fund 2, L.P., (C)(i) 288,491 shares of common stock to be issued to Alyeska Master Fund, L.P. at the Second Closing and (ii) 196,172 shares of common stock to be issued to Alyeska Master Fund 2, L.P. at the Second Closing, and (D)(i) 288,491 Second Closing Warrant Shares issuable upon exercise of the Second Closing Warrants to be issued to Alyeska Master Fund, L.P. and (ii) 196,172 Second Closing Warrant Shares issuable upon exercise of the Second Closing Warrants to be issued to Alyeska Master Fund 2, L.P.

* Less than 1%

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Relationship with the Selling Stockholders

Registration Rights Agreement

The selling stockholders are a party to the Registration Rights Agreement. For more information, see description in section titled “Description of Capital Stock—Registration Rights” above.

PLAN OF DISTRIBUTION

We are registering the shares of common stock issued, or to be issued, to the selling stockholders and issuable upon exercise of the warrants and conversion of the Class Y Preferred Stock issued, or to be issued to the selling stockholders to permit the resale of these shares of common stock by the holders of the shares of common stock, warrants and Class Y Preferred Stock from time to time after the date of this prospectus. We will not receive any of the proceeds from the sale by the selling stockholders of the shares of common stock.

We will bear all fees and expenses incident to our obligation to register the shares of common stock. The selling stockholders may sell all or a portion of the shares of common stock beneficially owned by them and offered hereby from time to time directly or through one or more underwriters, broker-dealers or agents. If the shares of common stock are sold through underwriters or broker-dealers, the selling stockholders will be responsible for underwriting discounts or commissions or agent's commissions. The shares of common stock may be sold on any national securities exchange or quotation service on which the securities may be listed or quoted at the time of sale, in the over-the-counter market or in transactions otherwise than on these exchanges or systems or in the over-the-counter market and in one or more transactions at fixed prices, at prevailing market prices at the time of the sale, at varying prices determined at the time of sale, or at negotiated prices. These sales may be effected in transactions, which may involve crosses or block transactions. The selling stockholders may use any one or more of the following methods when selling shares:

- ordinary brokerage transactions and transactions in which the broker-dealer solicits purchasers;
- block trades in which the broker-dealer will attempt to sell the shares as agent but may position and resell a portion of the block as principal to facilitate the transaction;
- purchases by a broker-dealer as principal and resale by the broker-dealer for its account;
- an exchange distribution in accordance with the rules of the applicable exchange; privately negotiated transactions; settlement of short sales entered into after the effective date of the registration statement of which this prospectus is a part; broker-dealers may agree with the selling stockholders to sell a specified number of such shares at a stipulated price per share; through the writing or settlement of options or other hedging transactions, whether such options are listed on an options exchange or otherwise; a combination of any such methods of sale; and any other method permitted pursuant to applicable law.

The selling stockholders also may resell all or a portion of the shares in open market transactions in reliance upon Rule 144 under the Securities Act of 1933, as amended, or the Securities Act, as permitted by that rule, or Section 4(a)(1) under the Securities Act, if available, rather than under this prospectus, provided that they meet the criteria and conform to the requirements of those provisions.

Broker-dealers engaged by the selling stockholders may arrange for other broker-dealers to participate in sales. If the selling stockholders effect such transactions by selling shares of common stock to or through underwriters, broker-dealers or agents, such underwriters, broker-dealers or agents may receive commissions in the form of discounts, concessions or commissions from the selling stockholders or commissions from purchasers of the shares of common stock for whom they may act as agent or to whom they may sell as principal. Such commissions will be in amounts to be negotiated, but, except as set forth in a supplement to this Prospectus, in the case of an agency transaction will not be in excess of a customary brokerage commission in compliance with FINRA Rule 2121; and in the case of a principal transaction a markup or markdown in compliance with FINRA Rule 2121.01.

In connection with sales of the shares of common stock or otherwise, the selling stockholders may enter into hedging transactions with broker-dealers or other financial institutions, which may in turn engage in short sales of the shares of common stock in the course of hedging in positions they assume. The selling stockholders may also sell shares of common stock short and if such short sale shall take place after the date that this Registration

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Statement is declared effective by the Commission, the selling stockholders may deliver shares of common stock covered by this prospectus to close out short positions and to return borrowed shares in connection with such short sales. The selling stockholders may also loan or pledge shares of common stock to broker-dealers that in turn may sell such shares, to the extent permitted by applicable law. The selling stockholders may also enter into option or other transactions with broker-dealers or other financial institutions or the creation of one or more derivative securities which require the delivery to such broker-dealer or other financial institution of shares offered by this prospectus, which shares such broker-dealer or other financial institution may resell pursuant to this prospectus (as supplemented or amended to reflect such transaction). Notwithstanding the foregoing, the selling stockholders have been advised that they may not use shares registered on this registration statement to cover short sales of our common stock made prior to the date the registration statement, of which this prospectus forms a part, has been declared effective by the SEC.

The selling stockholders may, from time to time, pledge or grant a security interest in some or all of the warrants or the shares of common stock or Class Y Preferred Stock owned by them and, if they default in the performance of their secured obligations, the pledgees or secured parties may offer and sell the shares of common stock from time to time pursuant to this prospectus or any amendment to this prospectus under Rule 424(b)(3) or other applicable provision of the Securities Act, amending, if necessary, the list of selling stockholders to include the pledgee, transferee or other successors in interest as selling stockholders under this prospectus. The selling stockholders also may transfer and donate the shares of common stock in other circumstances in which case the transferees, donees, pledgees or other successors in interest will be the selling beneficial owners for purposes of this prospectus.

The selling stockholders and any broker-dealer or agents participating in the distribution of the shares of common stock may be deemed to be “underwriters” within the meaning of Section 2(11) of the Securities Act in connection with such sales. In such event, any commissions paid, or any discounts or concessions allowed to, any such broker-dealer or agent and any profit on the resale of the shares purchased by them may be deemed to be underwriting commissions or discounts under the Securities Act. Selling Stockholders who are “underwriters” within the meaning of Section 2(11) of the Securities Act will be subject to the applicable prospectus delivery requirements of the Securities Act including Rule 172 thereunder and may be subject to certain statutory liabilities of, including but not limited to, Sections 11, 12 and 17 of the Securities Act and Rule 10b-5 under the Exchange Act.

Each selling stockholder has informed the Company that it is not a registered broker-dealer and does not have any written or oral agreement or understanding, directly or indirectly, with any person to distribute the Common Stock. Upon the Company being notified in writing by a selling stockholder that any material arrangement has been entered into with a broker-dealer for the sale of common stock through a block trade, special offering, exchange distribution or secondary distribution or a purchase by a broker or dealer, a supplement to this prospectus will be filed, if required, pursuant to Rule 424(b) under the Securities Act, disclosing (i) the name of each such selling stockholder and of the participating broker-dealer(s), (ii) the number of shares involved, (iii) the price at which such the shares of common stock were sold, (iv) the commissions paid or discounts or concessions allowed to such broker-dealer(s), where applicable, (v) that such broker-dealer(s) did not conduct any investigation to verify the information set out or incorporated by reference in this prospectus, and (vi) other facts material to the transaction. In no event shall any broker-dealer receive fees, commissions and markups, which, in the aggregate, would exceed eight percent (8.0%).

Under the securities laws of some states, the shares of common stock may be sold in such states only through registered or licensed brokers or dealers. In addition, in some states the shares of common stock may not be sold unless such shares have been registered or qualified for sale in such state or an exemption from registration or qualification is available and is complied with.

There can be no assurance that any selling stockholder will sell any or all of the shares of common stock registered pursuant to the shelf registration statement, of which this prospectus forms a part.

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Each selling stockholder and any other person participating in such distribution will be subject to applicable provisions of the Exchange Act and the rules and regulations thereunder, including, without limitation, to the extent applicable, Regulation M of the Exchange Act, which may limit the timing of purchases and sales of any of the shares of common stock by the selling stockholder and any other participating person. To the extent applicable, Regulation M may also restrict the ability of any person engaged in the distribution of the shares of common stock to engage in market-making activities with respect to the shares of common stock. All of the foregoing may affect the marketability of the shares of common stock and the ability of any person or entity to engage in market-making activities with respect to the shares of common stock.

We will pay all expenses of the registration of the shares of common stock pursuant to the Registration Rights Agreement, including, without limitation, SEC filing fees and expenses of compliance with state securities or “blue sky” laws; *provided, however*, that each selling stockholder will pay all underwriting discounts and selling commissions, if any and any related legal expenses incurred by it. We will indemnify the selling stockholders against certain liabilities, including some liabilities under the Securities Act, in accordance with the Registration Rights Agreement, or the selling stockholders will be entitled to contribution. We may be indemnified by the selling stockholders against civil liabilities, including liabilities under the Securities Act, that may arise from any written information furnished to us by the selling stockholders specifically for use in this prospectus, in accordance with the related Registration Rights Agreement, or we may be entitled to contribution.

LEGAL MATTERS

Certain legal matters in connection with this offering will be passed upon for us by Goodwin Procter LLP, San Francisco, California.

EXPERTS

The financial statements as of December 31, 2016 and 2015 and for each of the three years in the period ended December 31, 2016 and management's assessment of the effectiveness of internal control over financial reporting as of December 31, 2016 incorporated by reference in this Prospectus have been so incorporated in reliance on the reports of BDO USA, LLP, an independent registered public accounting firm (the report on the financial statements contains an explanatory paragraph regarding the Company's ability to continue as a going concern), incorporated herein by reference, given on the authority of said firm as experts in auditing and accounting.

WHERE YOU CAN FIND MORE INFORMATION

We have filed a registration statement, of which this prospectus is a part, covering the securities offered hereby. As allowed by SEC rules, this prospectus does not include all of the information contained in the registration statement. You are referred to the registration statement and the included exhibits for further information. This prospectus is qualified in its entirety by such other information.

We are subject to the information requirements of the Securities Exchange Act and file annual, quarterly and current reports, proxy statements and other information with the SEC. You can read our SEC filings, including the registration statement, over the Internet at the SEC's website at www.sec.gov. You may also read and copy any document we file with the SEC at its Public Reference Room at 100 F Street, N.E., Washington, D.C., 20549. Please call the SEC at 1-800-SEC-0330 for further information on the operation of the public reference facility. Additionally, we make these filings available, free of charge, on our website at www.anthera.com as soon as reasonably practicable after we electronically file such materials with, or furnish them to, the SEC.

We have the authority to designate and issue more than one class or series of stock having various preferences, conversion and other rights, voting powers, restrictions, limitations as to dividends, qualifications, and terms and conditions of redemption. See "Description of Capital Stock." We will furnish a full statement of the relative rights and preferences of each class or series of our stock which has been so designated and any restrictions on the ownership or transfer of our stock to any stockholder upon written or oral request and without charge. Written requests for such copies should be directed to Anthera Pharmaceuticals, Inc., 25801 Industrial Boulevard, Suite B, Hayward, California 94545, Attention: Secretary or by telephone request to (510) 856-5600. Our website is located at www.anthera.com. Information contained on our website is not incorporated by reference into this prospectus and, therefore, is not part of this prospectus or any accompanying prospectus supplement.

INCORPORATION BY REFERENCE

The SEC allows us to incorporate by reference the information and reports we file with it, which means that we can disclose important information to you by referring you to these documents. The information incorporated by reference is an important part of this prospectus, and information that we file later with the SEC will automatically update and supersede the information already incorporated by reference. We are incorporating by reference the documents listed below, which we have already filed with the SEC, and any future filings we make with the SEC under Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act, including all filings made after the date of the filing of this registration statement and prior to the effectiveness of this registration statement, except as to any portion of any future report or document that is not deemed filed under such provisions, until we sell all of the securities:

1. Annual Report on Form 10-K for the year ended December 31, 2016 filed with the SEC on March 16, 2017;
2. The information specifically incorporated by reference into our Annual Report on Form 10-K for the year ended December 31, 2016 from our definitive proxy statement on Schedule 14A (other than information furnished rather than filed), which was filed with the SEC on March 16, 2017;
3. Quarterly Reports on Form 10-Q filed with the SEC for the quarters ended March 31, 2017, June 30, 2017 and September 30, 2017;
4. Our Current Reports on Form 8-K filed with the SEC on February 16, 2017, March 16, 2017, March 31, 2017, April 27, 2017, April 28, 2017, May 18, 2017, May 25, 2017, June 19, 2017, July 14, 2017, August 9, 2017 (with respect to item 8.01 only), August 28, 2017, and October 25, 2017; and
5. The description of our common stock contained in our registration statement on Form 8-A (File No. 001-34637) filed with the SEC on February 22, 2010, including any amendment or report filed for the purpose of updating such description.

We will provide, without charge, to each person, including any beneficial owner, to whom a copy of this prospectus supplement is delivered, upon such person's written or oral request, a copy of any and all of the information incorporated by reference in this prospectus supplement, other than exhibits to such documents, unless such exhibits are specifically incorporated by reference into the information that this prospectus supplement incorporates. Requests should be directed to the Corporate Secretary, Anthera Pharmaceuticals, Inc., 25801 Industrial Boulevard, Suite B, Hayward, California 94545; telephone: (510) 856-5600. We have authorized no one to provide you with any information that differs from that contained in this prospectus supplement. Accordingly, you should not rely on any such information that is not contained in this prospectus supplement. You should not assume that the information in this prospectus supplement is accurate as of any date other than the date of the front cover of this prospectus supplement.



28,613,474 Shares of Common Stock

PROSPECTUS

November , 2017

Part II—INFORMATION NOT REQUIRED IN PROSPECTUS

Item 14. Other Expenses of Issuance and Distribution

The following table sets forth the various expenses to be incurred in connection with the issuance and distribution of the securities being registered, all of which will be borne by Anthera Pharmaceuticals, Inc., or the Company or the registrant. Each item listed is estimated, except for the SEC registration fee.

SEC registration fee	\$ 6,234.18
Legal fees and expenses	270,000.00
Printing fees and miscellaneous fees	<u>30,000.00</u>
Total	\$ 306,234.18

Item 15. Indemnification of Directors and Officers

Section 145 of the Delaware General Corporation Law, or the DGCL, authorizes a corporation to indemnify its directors and officers against liabilities arising out of actions, suits and proceedings to which they are made or threatened to be made a party by reason of the fact that they have served or are currently serving as a director or officer to a corporation. The indemnity may cover expenses (including attorneys' fees), judgments, fines and amounts paid in settlement actually and reasonably incurred by the director or officer in connection with any such action, suit or proceeding. Section 145 permits corporations to pay expenses (including attorneys' fees) incurred by directors and officers in advance of the final disposition of such action, suit or proceeding. In addition, Section 145 provides that a corporation has the power to purchase and maintain insurance on behalf of its directors and officers against any liability asserted against them and incurred by them in their capacity as a director or officer, or arising out of their status as such, whether or not the corporation would have the power to indemnify the director or officer against such liability under Section 145.

We have adopted provisions in our restated certificate of incorporation and amended and restated bylaws that limit or eliminate the personal liability of our directors to the fullest extent permitted by the DGCL, as it now exists or may in the future be amended. Consequently, a director will not be personally liable to us or our stockholders for monetary damages or breach of fiduciary duty as a director, except for liability for:

- any breach of the director's duty of loyalty to us or our stockholders;
- any act or omission not in good faith or that involves intentional misconduct or a knowing violation of law;
- any unlawful payments related to dividends or unlawful stock purchases, redemptions or other distributions; or
- any transaction from which the director derived an improper personal benefit.

These limitations of liability do not alter director liability under the federal securities laws and do not affect the availability of equitable remedies such as an injunction or rescission.

In addition, our bylaws provide that:

- we will indemnify our directors, officers and, in the discretion of our board of directors, certain employees to the fullest extent permitted by the DGCL, as it now exists or may in the future be amended; and
- we will advance reasonable expenses, including attorneys' fees, to our directors and, in the discretion of our board of directors, to our officers and certain employees, in connection with legal proceedings relating to their service for or on behalf of us, subject to limited exceptions.

We have entered into indemnification agreements with each of our directors and certain of our executive officers. These agreements provide that we will indemnify each of our directors, certain of our executive officers and, at times, their affiliates to the fullest extent permitted by Delaware law. We will advance expenses,

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including attorneys' fees (but excluding judgments, fines and settlement amounts), to each indemnified director, executive officer or affiliate in connection with any proceeding in which indemnification is available and we will indemnify our directors and officers for any action or proceeding arising out of that person's services as a director or officer brought on behalf of the Company or in furtherance of our rights. Additionally, certain of our directors may have certain rights to indemnification, advancement of expenses or insurance provided by their affiliates, which indemnification relates to and might apply to the same proceedings arising out of such director's services as a director referenced herein. Nonetheless, we have agreed in the indemnification agreements that the Company's obligations to those same directors are primary and any obligation of the affiliates of those directors to advance expenses or to provide indemnification for the expenses or liabilities incurred by those directors are secondary. We also maintain a general liability insurance policy which covers certain liabilities of directors and officers of our Company arising out of claims based on acts or omissions in their capacities as directors or officers, including liabilities under the Securities Act of 1933, as amended.

Item 16. Exhibits

A list of exhibits filed with this registration statement on Form S-3 is set forth on the Exhibit Index and is incorporated herein by reference.

Item 17. Undertakings

The undersigned registrant hereby undertakes:

(a)(1) To file, during any period in which offers or sales are being made, a post-effective amendment to this registration statement:

(i) To include any prospectus required by Section 10(a)(3) of the Securities Act of 1933;

(ii) To reflect in the prospectus any facts or events arising after the effective date of the registration statement (or the most recent post-effective amendment thereof) which, individually or in the aggregate, represent a fundamental change in the information set forth in the registration statement. Notwithstanding the foregoing, any increase or decrease in volume of securities offered (if the total dollar value of securities offered would not exceed that which was registered) and any deviation from the low or high end of the estimated maximum offering range may be reflected in the form of prospectus filed with the Securities and Exchange Commission pursuant to Rule 424(b) if, in the aggregate, the changes in volume and price represent no more than a 20 percent change in the maximum aggregate offering price set forth in the "Calculation of Registration Fee" table in the effective registration statement; and

(iii) To include any material information with respect to the plan of distribution not previously disclosed in the registration statement or any material change to such information in the registration statement; *provided, however*, that paragraphs (a)(1)(i), (a)(1)(ii) and (a)(1)(iii) of this section do not apply if the information required to be included in a post-effective amendment by those paragraphs is contained in reports filed with or furnished to the Securities and Exchange Commission by the registrant pursuant to Section 13 or Section 15(d) of the Securities Exchange Act of 1934 that are incorporated by reference in the registration statement, or is contained in a form of prospectus filed pursuant to Rule 424(b) that is part of the registration statement.

(2) That, for the purpose of determining any liability under the Securities Act of 1933, each such post-effective amendment shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial *bona fide* offering thereof.

(3) To remove from registration by means of a post-effective amendment any of the securities being registered which remain unsold at the termination of the offering.

(4) That, for the purpose of determining liability under the Securities Act of 1933 to any purchaser:

(i) If the registrant is subject to Rule 430B, each prospectus filed by the registrant pursuant to Rule 424(b)(3) shall be deemed to be part of the registration statement as of the date the filed prospectus was deemed part of and included in the registration statement; and

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(ii) Each prospectus required to be filed pursuant to Rule 424(b)(2), (b)(5), or (b)(7) as part of a registration statement in reliance on Rule 430B relating to an offering made pursuant to Rule 415(a)(1)(i), (vii), or (x) for the purpose of providing the information required by Section 10(a) of the Securities Act of 1933 shall be deemed to be part of and included in the registration statement as of the earlier of the date such form of prospectus is first used after effectiveness or the date of the first contract of sale of securities in the offering described in the prospectus. As provided in Rule 430B, for liability purposes of the issuer and any person that is at that date an underwriter, such date shall be deemed to be a new effective date of the registration statement relating to the securities in the registration statement to which that prospectus relates, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof; *provided, however*, that no statement made in a registration statement or prospectus that is part of the registration statement or made in a document incorporated or deemed incorporated by reference into the registration statement or prospectus that is part of the registration statement will, as to a purchaser with a time of contract of sale prior to such effective date, supersede or modify any statement that was made in the registration statement or prospectus that was part of the registration statement or made in any such document immediately prior to such effective date.

(5) That, for the purpose of determining liability of the registrant under the Securities Act of 1933 to any purchaser in the initial distribution of the securities, the undersigned registrant undertakes that in a primary offering of securities of the undersigned registrant pursuant to this registration statement, regardless of the underwriting method used to sell the securities to the purchaser, if the securities are offered or sold to such purchaser by means of any of the following communications, the undersigned registrant will be a seller to the purchaser and will be considered to offer or sell such securities to such purchaser:

(i) Any preliminary prospectus or prospectus of the undersigned registrant relating to the offering required to be filed pursuant to Rule 424;

(ii) Any free writing prospectus relating to the offering prepared by or on behalf of the undersigned registrant or used or referred to by the undersigned registrant;

(iii) The portion of any other free writing prospectus relating to the offering containing material information about the undersigned registrant or its securities provided by or on behalf of the undersigned registrant; and

(iv) Any other communication that is an offer in the offering made by the undersigned registrant to the purchaser.

(6) That, for purposes of determining any liability under the Securities Act of 1933, each filing of the registrant's annual report pursuant to Section 13(a) or Section 15(d) of the Securities Exchange Act of 1934 (and, where applicable, each filing of an employee benefit plan's annual report pursuant to Section 15(d) of the Securities Exchange Act of 1934) that is incorporated by reference in the registration statement shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial *bona fide* offering thereof.

(7) Insofar as indemnification for liabilities arising under the Securities Act of 1933 may be permitted to directors, officers and controlling persons of the registrant pursuant to the foregoing provisions, or otherwise, the registrant has been advised that in the opinion of the Securities and Exchange Commission such indemnification is against public policy as expressed in the Securities Act of 1933 and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by the registrant of expenses incurred or paid by a director, officer or controlling person of the registrant in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, the registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the Securities Act of 1933 and will be governed by the final adjudication of such issue.

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EXHIBIT INDEX

<u>Exhibit No.</u>	<u>Description</u>
3.1	Fifth Amended and Restated Certificate of Incorporation (Filed as Exhibit 3.6 to the registrant's Registration Statement on Form S-1/A (File No. 333-161930), filed with the SEC on February 3, 2010 and incorporated herein by reference)
3.2	Certificate of Designation of Preferences, Rights and Limitations of Class Y Convertible Preferred Stock (filed as Exhibit 3.1 to the registrant's Current Report on Form 8-K dated October 23, 2017 and filed on October 25, 2017 and incorporated herein by reference)
3.3	Amended and Restated Bylaws (Filed as Exhibit 3.4 to the registrant's Quarterly Report on Form 10-Q filed with the SEC on August 10, 2015 and incorporated herein by reference)
4.1	Specimen certificate evidencing shares of Class Y Convertible Preferred Stock (Filed as Exhibit A to the Certificate of Designation of Preferences, Rights and Limitations of Class Y Convertible Preferred Stock filed as Exhibit 3.1 to the registrant's Current Report on Form 8-K on October 25, 2017 and incorporated herein by reference)
4.2	Securities Purchase Agreement, dated October 23, 2017, by and among the Company and the Purchasers party thereto (filed as Exhibit 10.1 to the registrant's Current Report on Form 8-K dated October 23, 2017 and filed on October 25, 2017 and incorporated herein by reference)
4.3	Registration Rights Agreement, dated October 23, 2017, by and among the Company and the Purchasers party thereto (filed as Exhibit 10.2 to the registrant's Current Report on Form 8-K dated October 23, 2017 and filed on October 25, 2017 and incorporated herein by reference)
4.4	Form of Warrant to Purchase Common Stock, dated October 23, 2017, issued by the registrant (filed as Exhibit 10.3 to the registrant's Current Report on Form 8-K dated October 23, 2017 and filed on October 25, 2017 and incorporated herein by reference)
5.1	Opinion of Goodwin Procter LLP
23.1	Consent of Independent Registered Public Accounting Firm
23.2	Consent of Goodwin Procter LLP (included in Exhibit 5.1 hereto)
24.1	Power of Attorney (included on the signature pages to this registration statement)

SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, as amended, the registrant certifies that it has reasonable grounds to believe that it meets all of the requirements for filing on Form S-3 and has duly caused this registration statement to be signed on its behalf by the undersigned, thereunto duly authorized, in City of Hayward, State of California, on November 13, 2017.

Anthera Pharmaceuticals, Inc.

By: /s/ J. Craig Thompson
J. Craig Thompson
Chief Executive Officer

We, the undersigned officers and directors of Anthera Pharmaceuticals, Inc., hereby severally constitute and appoint J. Craig Thompson and May Liu, and each of them singly (with full power to each of them to act alone), our true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution in each of them for him and in his name, place and stead, and in any and all capacities, to sign for us and in our names in the capacities indicated below any and all amendments (including post-effective amendments) to this registration statement on Form S-3 (or any other registration statement for the same offering that is to be effective upon filing pursuant to Rule 462(b) under the Securities Act of 1933, as amended), and to file the same, with all exhibits thereto and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite or necessary to be done in and about the premises, as full to all intents and purposes as he might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents or any of them, or their or his substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Act of 1933, this registration statement has been signed by the following persons in the capacities and on the dates indicated.

<u>Signature</u>	<u>Title</u>	<u>Date</u>
<u>/s/ J. Craig Thompson</u> J. Craig Thompson	Chief Executive Officer and Director (Principal Executive Officer)	November 13, 2017
<u>/s/ May Liu</u> May Liu	Senior Vice President, Finance and Administration (Principal Accounting Officer)	November 13, 2017
<u>/s/ Paul F. Truex</u> Paul F. Truex	Chairman of the Board of Directors	November 13, 2017
<u>/s/ Christopher S. Henney</u> Christopher S. Henney	Director	November 13, 2017
<u>/s/ Brian R. Mueller</u> Brian R. Mueller	Director	November 13, 2017
<u>/s/ David E. Thompson</u> David E. Thompson	Director	November 13, 2017
<u>/s/ Brent V. Furse</u> Brent V. Furse	Director	November 13, 2017
<u>/s/ Philip T. Sager</u> Philip T. Sager	Director	November 13, 2017



November 13, 2017

Anthera Pharmaceuticals, Inc.
25801 Industrial Blvd., Suite B
Hayward, California 94545

Re: Securities Registered under Registration Statement on Form S-3

Ladies and Gentlemen:

We have acted as counsel to you in connection with your filing of a Registration Statement on Form S-3 (as amended or supplemented, the "Registration Statement") filed on November 13, 2017 with the Securities and Exchange Commission (the "Commission") pursuant to the Securities Act of 1933, as amended (the "Securities Act"), relating to the registration of the offering of up to 28,613,474 shares (the "Shares") of common stock, par value \$0.001 per share ("Common Stock") of Anthera Pharmaceuticals, Inc., a Delaware corporation (the "Company"), to be sold by the selling stockholders listed in the Registration Statement under "Selling Stockholders" (the "Selling Stockholders"). The Shares include

- 2,306,737 Shares (the "Initial Closing Shares") issued pursuant to a Securities Purchase Agreement dated October 23, 2017 (the "Purchase Agreement");
- 7,625,741 Shares (the "Second Closing Shares") to be issued to the Selling Stockholders pursuant to the Purchase Agreement;
- 2,067,522 Shares (the "Conversion Shares") issuable upon conversion of Class Y Preferred Stock to be issued to the Selling Stockholders pursuant to the Purchase Agreement; and
- 16,613,474 Shares (the "Warrant Shares") issuable upon exercise of warrants (the "Initial Closing Warrants") issued and issuable pursuant to the Purchase Agreement.

We have reviewed such documents and made such examination of law as we have deemed appropriate to give the opinions set forth below. We have relied, without independent verification, on certificates of public officials and, as to matters of fact material to the opinions set forth below, on certificates of officers of the Company. For purposes of the opinion set forth below, we have assumed that before the Shares are issued the Company does not issue shares of Common Stock or reduce the total number of shares of Common Stock that the Company is authorized to issue under its certificate of incorporation such that the number of unissued shares of Common Stock authorized under the Company's certificate of incorporation is less than the number of Shares.

The opinion set forth below is limited to the Delaware General Corporation Law.

Based on the foregoing, we are of the opinion that:

The Initial Closing Shares have been duly authorized and validly issued and are fully paid and non-assessable, and the Second Closing Shares, Conversion Shares and Warrant Shares are duly authorized and, upon issuance and delivery against payment therefor in accordance with the Purchase Agreement, Class Y Preferred and Warrants, respectively, will be validly issued, fully paid and non-assessable.

We hereby consent to the inclusion of this opinion as Exhibit 5.1 to the Registration Statement and to the references to our firm under the caption "Legal Matters" in the Registration Statement. In giving our consent, we do not admit that we are in the category of persons whose consent is required under Section 7 of the Securities Act or the rules and regulations thereunder.

Very truly yours,

/s/ GOODWIN PROCTER LLP

GOODWIN PROCTER LLP

Consent of Independent Registered Public Accounting Firm

Anthera Pharmaceuticals, Inc.
Hayward, California

We hereby consent to the incorporation by reference in the Prospectus constituting a part of this Registration Statement of our reports dated March 16, 2017, relating to the consolidated financial statements and the effectiveness of Anthera Pharmaceuticals, Inc.'s internal control over financial reporting, appearing in the Company's Annual Report on Form 10-K for the year ended December 31, 2016. Our report contains an explanatory paragraph regarding the Company's ability to continue as a going concern.

We also consent to the reference to us under the caption "Experts" in the Prospectus.

/s/BDO USA, LLP
San Francisco, California

November 13, 2017