Table of Contents

Registration No. 333-

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

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

ATHENEX, INC.
(Exact Name of Registrant as Specified in Its Charter)

Delaware	**43-1985966**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification No.)**

1001 Main Street, Suite 600
Buffalo, NY 14203
(716) 427-2950
(Address, including zip code and telephone number, including area code, of registrant's principal executive offices)

Johnson Y.N. Lau
Chief Executive Officer
Athenex, Inc.
1001 Main Street, Suite 600
Buffalo, NY 14203
(716) 427-2950
(Name, address, including zip code, and telephone number, including area code, of agent for service)

Copies to:

James M. Jenkins, Esq.
Alexander R. McClean, Esq.
Harter Secrest & Emery LLP
1600 Bausch & Lomb Place
Rochester, NY 14604
(585) 232-6500

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, 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. (Check one):

Large accelerated filer	☐	Accelerated filer	☒
Non-accelerated filer	☐	Smaller reporting company	☐

Emerging growth company ☒

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

Table of Contents

CALCULATION OF REGISTRATION FEE

TITLE OF EACH CLASS OF SECURITIES TO BE REGISTERED(1)	AMOUNT TO BE REGISTERED(1)	PROPOSED MAXIMUM OFFERING PRICE PER SHARE	PROPOSED MAXIMUM AGGREGATE OFFERING PRICE	AMOUNT OF REGISTRATION FEE
Common Stock, $0.001 par value per share	10,000,000	$19.18(2)	$191,800,000(2)	$23,247

(1) In the event of a stock split, stock dividend or similar transaction involving our common stock, the number of shares registered shall automatically be increased to cover additional shares of common stock issuable pursuant to Rule 416 under the Securities Act of 1933, as amended (the "Securities Act").

(2) Estimated for the sole purpose of computing the registration fee in accordance with Rule 457(c) under the Securities Act for the shares of common stock for resale by the selling stockholders named herein. The price per share and the aggregate offering price are based on the average of the high and low prices of the registrant's common stock on July 19, 2019, as reported on the Nasdaq Global Select Market.

Table of Contents

PROSPECTUS

Athenex, Inc.

10,000,000 Shares of Common Stock Offered by the Selling Stockholders

This prospectus relates to the offer and resale by the selling stockholders identified herein of up to 10,000,000 shares of our common stock, par value $0.001 per share ("Common Stock"). This prospectus provides you with a general description of the securities listed above. You should carefully read this prospectus and the documents incorporated by reference before buying any of the securities being offered.

The registration of shares of Common Stock hereunder does not mean that the selling stockholders will actually offer or sell the full number of shares being registered pursuant to this prospectus. The selling stockholders may sell the shares of Common Stock and other securities registered hereby from time to time. The shares of Common Stock may be offered and sold by any selling stockholders through public or private transactions, at market prices prevailing at the time of sale or at negotiated prices. The selling stockholders may retain underwriters, dealers or agents from time to time. For additional information on the methods of sale, you should refer to the section entitled "Plan of Distribution" in this prospectus.

We will receive no proceeds from any sale by selling stockholders of the securities covered by this prospectus, but we may, in some cases, pay certain registration and offering fees and expenses on their behalf.

Our Common Stock is traded on The Nasdaq Global Select Market under the symbol "ATNX." On July 22, 2019, the last reported sale price of our Common Stock on The Nasdaq Global Select Market was $19.54 per share.

We are an "emerging growth company," as that term is used in the Jumpstart Our Business Startups Act of 2012 and, as such, have elected to comply with reduced public company reporting requirements.

Investing in our Common Stock involves a high degree of risk. Please read "Risk Factors" beginning on page 7 of this prospectus before making a decision to invest in our Common Stock.

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 July 23, 2019

TABLE OF CONTENTS

You should rely only on the information contained in, or incorporated by reference into, this prospectus and any applicable prospectus supplement we or the selling stockholders have authorized for use in connection with this offering. We and the selling stockholders have not authorized anyone to provide you with different information. We and the selling stockholders are not making an offer to sell or seeking an offer to buy securities under this prospectus or any applicable prospectus supplement in any jurisdiction where the offer or sale is not permitted. The information contained in this prospectus, any applicable prospectus supplement and the documents incorporated by reference herein and therein, are accurate only as of their respective dates, regardless of the time of delivery of this prospectus, any applicable prospectus supplement, or any sale of a security.

ABOUT THIS PROSPECTUS

This prospectus relates to the resale by the selling stockholders described in the section of this prospectus entitled "Selling Stockholders" (hereinafter defined as "Selling Stockholders") of up to 10,000,000 shares of our common stock, $0.001 par value per share (the "Common Stock"). This prospectus is part of a registration statement on Form S-3 that we filed with the Securities and Exchange Commission (the "SEC") as a "well-known seasoned issuer" as defined in Rule 405 under the Securities Act of 1933, as amended (the "Securities Act") using a "shelf" registration process. Under this shelf registration process, the Selling Stockholders may, from time to time, offer and sell the shares of common stock described in this prospectus in one or more offerings. In a prospectus supplement, we may also add, update, or change any of the information contained in this prospectus or in the documents we have incorporated by reference into this prospectus. This prospectus, together with any applicable prospectus supplement and the documents incorporated by reference into this prospectus and any applicable prospectus supplement, will include all material information relating to this offering. Before buying any of the securities being offered, you should carefully read this prospectus and any applicable prospectus supplement, together with the additional information described in the section entitled "Where You Can Find Additional Information."

This prospectus contains summaries of certain provisions contained in some of the documents described herein, but reference is made to the actual documents for complete information. Copies of some of the documents referred to herein have been filed, will be filed or will be incorporated by reference as exhibits to the registration statement of which this prospectus is a part, and you may obtain copies of those documents as described below under the section entitled "Where You Can Find More Information."

Unless otherwise mentioned or unless the context requires otherwise, when used in this prospectus, the terms "Athenex", "Company", "we", "us", and "our" refer to Athenex, Inc. and its subsidiaries.

NOTE ABOUT FORWARD-LOOKING STATEMENTS

This prospectus, including the documents that we incorporate by reference herein, contains, and any applicable prospectus supplement or free writing prospectus, including the documents we incorporate by reference therein, may contain forward-looking statements within the meaning of Section 21E of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), and section 27A of the Securities Act. All statements other than statements of historical fact are "forward-looking statements" for purposes of this prospectus. In some cases, you can identify forward-looking statements by terminology such as "anticipate," "believe," "continue," "could," "estimate," "expect," "foresee," "goal," "guidance," "indicate," "intend," "likely," "may," "might," "mission," "preliminary," "plan," "potentially," "predict," "probable," "project," "promising," "seek," "should," "strategy," "will," "would" and similar expressions and variations thereof.

Forward-looking statements appear in a number of places throughout this prospectus and the documents that we incorporate by reference herein, and include statements based largely on our current expectations and projections about future events and trends that we believe may affect our financial condition, results of operations, business strategy, short-term and long-term business operations and objectives and financial needs, such as:

- our ongoing and planned preclinical development and clinical trials;
- the development stage of our primary clinical candidates;
- the timing of and our ability to make regulatory filings and obtain and maintain regulatory approvals for our product candidates;
- the degree of clinical utility of our future product candidates, particularly in specific patient populations;

- our intellectual property position;
- our ability to develop commercial functions;
- our reliance on third parties for success in certain areas of our business;
- expectations regarding clinical trial data;
- our history of operating losses and need to raise additional capital to continue as a going concern;
- our results of operations, cash needs, spending of the proceeds from offerings of securities;
- our ability to integrate acquired assets and businesses into our existing operations;
- risks related to doing business in China, including the uncertain impact of inspections to be performed by regulators on our production facilities in China;
- the industry in which we operate and the trends that may affect our industry or us.

These forward-looking statements are subject to a number of risks, uncertainties and assumptions, including those described in the "Risk Factors" section included in our most recent Annual Report on Form 10-K. Moreover, we operate in a very competitive and rapidly changing environment, and new risks emerge from time to time. It is not possible for our management to predict all risks, nor can we assess the impact of all factors on our business. In light of these risks, uncertainties and assumptions, actual results could differ materially and adversely from those anticipated or implied in the forward-looking statements.

We discuss in greater detail, and incorporate by reference into this prospectus in their entirety, many of these risks and uncertainties under the heading "Risk Factors" contained in any applicable prospectus supplement, in any free writing prospectus we may authorize for use in connection with a specific offering, and in our most recent Annual Report on Form 10-K, as well as any amendments thereto reflected in subsequent filings with the SEC. These statements reflect our current views with respect to future events and are based on assumptions and subject to risks and uncertainties. Given these uncertainties, you should not rely on these forward-looking statements. We undertake no obligation to update publicly any forward-looking statements for any reason after the date of this prospectus to conform these statements to actual results or to changes in our expectations, except as required by law.

PROSPECTUS SUMMARY

The following summary, because it is a summary, may not contain all the information that may be important to you. This prospectus incorporates important business and financial information about the Company that is not included in, or delivered with, this prospectus. Before making an investment, you should read the entire prospectus and any amendment carefully. You should also carefully read the risks of investing discussed under "Risk Factors" and the financial statements included in our other filings with the SEC. This information is incorporated by reference into this prospectus, and you can obtain it from the SEC as described below under the headings "Where You Can Find More Information" and "Incorporation by Reference."

We will provide to each person, including any beneficial owner, to whom a prospectus is delivered a copy of any or all of the information that has been incorporated by reference in the prospectus but not delivered with the prospectus. You may request a copy of these filings, excluding the exhibits to such filings which we have not specifically incorporated by reference in such filings, at no cost, by writing us at 1001 Main Street, Suite 600, Buffalo, NY, 14203, United States.

Our Company

We are a global biopharmaceutical company dedicated to becoming a leader in the discovery, development and commercialization of next generation drugs for the treatment of cancer. Athenex is organized around three platforms, including an Oncology Innovation Platform, a Commercial Platform and a Global Supply Chain Platform. Our current clinical pipeline in the Oncology Innovation Platform is derived from our four different platform technologies: (1) Orascovery, based on a non-absorbed P-glycoprotein inhibitor, (2) Src Kinase inhibition, (3) T-cell Receptor-engineered T-cells ("TCR-T"), and (4) arginine deprivation therapy. We have assembled a leadership team and have established global operations across the pharmaceutical value chain to execute our mission to become a global leader in bringing innovative cancer treatments to the market and improve health outcomes.

Oncology Innovation Platform

Orascovery

Our Orascovery platform is based on the novel oral P-glycoprotein ("P-gp") pump inhibitor molecule, encequidar, formerly known as HM30181A. The P-gp pump is a plasma membrane protein on the cells of the gut which forms a localized drug transport system and limits oral absorption of known and widely used P-gp substrate cancer chemotherapeutic drugs such as paclitaxel, irinotecan and docetaxel, thus restricting current usage to intravenous ("IV") administration. IV chemotherapies' adverse events may be due, in part, to high peak blood concentration levels of the chemotherapeutic drugs. In addition, for some agents, there are infusion-related reactions caused, in part, by solubilizing dilution agents used to facilitate IV administration. A cancer patient's inability to tolerate IV chemotherapies may limit the duration of treatment and may limit the effectiveness of IV anti-cancer therapies. Sequential co-administration of encequidar and oral paclitaxel (also known as "Oraxol") facilitates oral absorption of paclitaxel and achieves therapeutic blood levels by blocking the P-gp pump. We believe oral administration of paclitaxel in combination with encequidar can reduce very high concentrations of paclitaxel in the blood and eliminate infusion-related reactions related to IV administration, which could improve patient tolerability and allow for longer dosing durations to improve efficacy. In addition to oral paclitaxel and encequidar, we are advancing other clinical candidates on this platform, including:

- Oral irinotecan and encequidar (also known as "Oratecan");
- Oral docetaxel and encequidar (also known as "Oradoxel");
- Oral topotecan and encequidar (also known as "Oratopo"); and
- Oral eribulin and encequidar (also known as "Eribulin ORA").

Src Kinase Inhibition

Src Kinase, a tyrosine kinase protein involved in regulating cell growth, is strongly implicated in blocking metastasis. Inhibiting Src Kinase may limit the growth or proliferation of cancerous cell types. Our Src Kinase Inhibition platform refers to novel small molecule compounds that have multiple mechanisms of action, including the inhibition of the activity of Src Kinase and the inhibition of tubulin polymerization during cell division. We believe the combination of these mechanisms of action provides a broader range of anti-cancer activity compared to either mechanism of action alone. Our key clinical product candidates and their indications in this platform are:

- Tirbanibulin (formerly known as "KX2-391" and "KX-01") ointments for actinic keratosis, skin cancer and psoriasis;
- Tirbanibulin (formerly known as "KX2-391" and "KX-01") oral for solid and liquid tumors; and
- KX2-361 (also known as "KX-02") for brain cancers, such as glioblastoma multiforme ("GBM").

T-cell Receptor-Engineered T-cells

In 2018, Axis Therapeutics Limited ("Axis"), which is owned 55% by us and 45% by Xiangxue Life Sciences Ltd. ("XLifeSc"), commenced the development of T-cell Receptor ("TCR") engineered T-cells through an in-license from XLifeSc. TCR-T immunotherapy technology harnesses and enhances the patient's own immune cells to target and eliminate cancer. It is a cell-based therapy that takes advantage of unique attributes of TCR mediated target recognition and provides a potent and selective TCR-T directed response against cancer cells. Central to this platform is the ability to first identify endogenous TCRs with specificity for a defined tumor antigen and to then enhance the affinity of the TCR to optimize tumor recognition and killing. These high affinity TCRs can be incorporated into a patient's own T cells, converting the cells into a potent anti-cancer therapy. Using this technology, we believe the platform has generated autologous engineered T-cells with high binding affinity, specificity for intended target cells, increased expression level of the TCR and persistence in patient circulation during therapy. Preliminary studies have shown positive clinical signals. Axis is responsible for all development, manufacturing and commercialization of this TCR-T immunotherapy technology.

Arginine Deprivation Therapy

The arginine deprivation therapy platform, based on our PEGylated genetically modified human arginase technology which is in-licensed from Avalon Polytom (HK) Limited, targets cancer growth and survival by removing the supply of arginine to a proportion of cancers with disrupted urea cycle. A significant proportion of cancer types lack the ability to synthesize arginine due to deficient expression of certain metabolic enzymes of the urea cycle, including argininosuccinate synthetase 1 ("ASS1"), argininosuccinate lyase ("ASL") or ornithine transcarbamylase ("OTC"). Our arginase biologic product, PT01 (also known as "Pegtomarginase"), is designed to deplete arginine from tumors with disrupted urea cycle, which we believe can halt the growth of the cancers and induce cell death. Healthy cells capable of producing sufficient levels of arginine would be largely unaffected. In June 2019, the U.S. Food and Drug Administration ("FDA") has allowed the Investigational New Drug ("IND") application for the clinical investigation of PT01 for the treatment of patients with advanced malignancies. The allowance is contingent on formal submission of agreed upon updates to the IND.

Commercial Platform

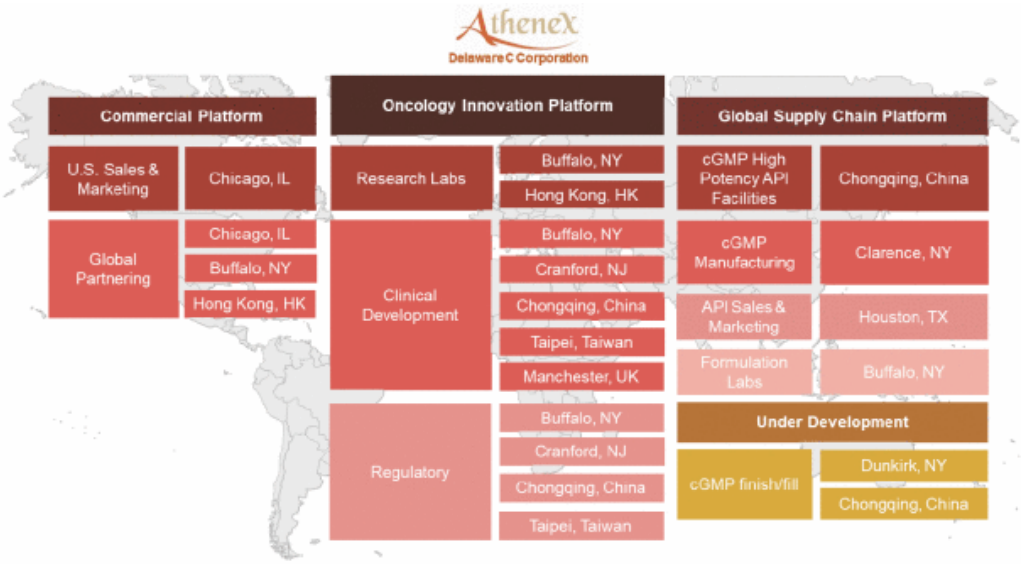
In advance of the launch of our proprietary product candidates in the U.S., our commercial team is marketing oncology and oncology symptom-related products to fund our infrastructure build-out. We believe it is important to minimize supply chain disruptions for high potency oncology active pharmaceutical ingredients. We have thus internalized key components of the supply chain that we believe are integral to minimizing the associated risks.

Global Supply Chain Platform

Our Global Supply Chain platform manufactures active pharmaceutical ingredients ("API"), for use internally in our research and development, clinical studies, and for sale to pharmaceutical customers globally. Our Commercial Platform currently markets 18 APIs produced by our Global Supply Chain Platform in the specialty and generic market segments in the United States, 29 products by the Athenex Pharmaceutical Division and six products subject to Section 503B of the Federal Food, Drug and Cosmetic Act ("FDCA") through our U.S. Food & Drug Administration ("FDA") registered outsourcing facility.

Our global operations across our Oncology Innovation Platform, Commercial Platform and Global Supply Chain Platform as of the date of this prospectus are shown below:

Overview of Our Business Organization



Recent Developments

Lead Orascovery platform drug candidate: Oral paclitaxel and encequidar

In January 2018, we received positive feedback from the FDA on the design of the ongoing Phase 3 trial (KX-ORAX-001). The feedback indicated that if the study meets the primary endpoint with an acceptable benefit to risk profile, it could be adequate as a single comparative trial to support registration of oral paclitaxel and encequidar in the U.S. for the indication of metastatic breast cancer. The Phase 3 clinical trial is a randomized controlled clinical trial comparing oral paclitaxel and encequidar monotherapy against IV paclitaxel monotherapy in patients with metastatic breast cancer. Also, in January 2018, the China National Medical Product Administration ("NMPA," formerly known as the China Food and Drug Administration) allowed the IND application for oral paclitaxel and encequidar, permitting us to commence a clinical trial program for the drug candidate in China.

In April 2018, the FDA granted Orphan Drug status to oral paclitaxel and encequidar for the treatment of angiosarcomas.

In August 2018, we received a positive recommendation by the Data and Safety Monitoring Board ("DSMB") of the second interim analysis of the oral paclitaxel and encequidar Phase 3 clinical trial.

In October 2018, we presented encouraging efficacy and safety data of oral paclitaxel and encequidar in the treatment of metastatic breast cancer patients obtained from a Phase 2 clinical trial conducted in Taiwan at the European Society for Medical Oncology Congress.

In November 2018, we initiated a Phase 1/2 clinical study to assess the safety, tolerability and activity of oral paclitaxel and encequidar in combination with an anti-PD1 antibody (pembrolizumab) in patients with advanced solid malignancies in collaboration with a research partner.

In December 2018, our global Phase 1b clinical trial of oral paclitaxel and encequidar plus ramucirumab (monoclonal antibody to VEGF-R2) in gastric cancer patients who failed previous chemotherapies completed the second cohort of patients and results indicated positive signals of efficacy. For the second cohort of six patients on an escalated oral paclitaxel dose of 250 mg/m^2, partial response, according to RECIST criteria, occurred in 3 patients (50%), compared to the first cohort of six patients who were treated with a 200 mg/m^2 dose where partial responses were observed in 2/6 patients (33.3%) and stable disease observed in 1/6 patient (16.7%). We have also completed the third patient cohort in our global Phase 1b study of oral paclitaxel and encequidar plus ramucirumab in patients with advanced gastric cancer. Having determined the maximal tolerated dose, we are now moving ahead with the expansion phase of the study.

In January 2019, the target enrollment in the oral paclitaxel and encequidar Phase 3 trial in metastatic breast cancer was achieved.

In March 2019, we presented a poster highlighting the preclinical data of oral paclitaxel and encequidar in angiosarcoma at the American Association of Cancer Research Annual Meeting.

In May 2019, we announced preliminary data showing promising early clinical responses in the first part of a two-part study of oral paclitaxel and encequidar monotherapy in patients with unresectable cutaneous angiosarcoma.

We also continue to advance the development of other Orascovery candidates. For example, in October 2018, we received FDA allowance of the IND application for oral eribulin plus encequidar.

If we receive approval from the FDA, our strategy is to develop and commercialize oral paclitaxel and encequidar in the U.S. through our Commercial Platform. We also plan to evaluate marketing options outside of the U.S., including using our internal resources, partnering with others, or out-licensing the product. If our Phase 3 study in metastatic breast cancer is successful, we intend to establish oral paclitaxel and encequidar as the chemotherapy of choice for patients receiving chemotherapy for metastatic breast cancer and intend to file a New Drug Application with the FDA to secure regulatory approval of oral paclitaxel and encequidar for metastatic breast cancer. If we receive regulatory approval from the FDA, we will then explore establishing oral paclitaxel and encequidar in other oncology indications where we believe taxanes will continue to be a foundational treatment. During 2019, we plan to focus on:

- quantitative and qualitative market research to understand our customers, patients and the market;
- preliminary forecasts;
- examining our competitive landscape;
- developing and completing brand strategy;
- developing key opinion leader relationships;

- attending priority medical conferences to increase awareness of the Company and oral paclitaxel and encequidar;
- creating a market access strategy;
- developing and executing a scientific publication plan;
- developing our distribution and patient support plans;
- completing our organizational design to determine the overall size of our go-to-market commercial team based on our market opportunity; and
- beginning hiring for key commercial and medical affairs leadership roles.

We can provide no assurance that we will be successful in obtaining the FDA's approval to commercialize oral paclitaxel and encequidar.

Lead Src Kinase Inhibition platform candidate: Tirbanibulin ointment, for Actinic Keratosis ("AK")

Patient enrollment in two identical Phase 3 studies was completed in February 2018. The studies enrolled a total of 702 patients across 62 sites in the U.S. Tirbanibulin ointment 1% or vehicle (randomized 1:1) was self-administered to 25 cm^2 of the face or scalp encompassing 4 to 8 typical AK lesions, once daily for 5 consecutive days.

In July 2018, we announced that both of our Phase 3 pivotal efficacy studies achieved their primary endpoint of 100% clearance of AK lesions at Day 57 within the face or scalp treatment areas, with each study achieving statistical significance ($p<0.0001$).

In March 2019, we presented topline results from the two Phase 3 studies in a late breaker session at the 2019 American Academy of Dermatology Annual Meeting. Results showed that 44% and 54% of patients in studies KX01-AK-003 and KX-01-AK-004, respectively, achieved 100% AK lesion clearance at Day 57 (*see* Table 1). The patient compliance rate in these two studies was greater than 99%. There was a statistically significant greater clearance rate in favor of the tirbanibulin ointment versus the vehicle in each of the patient subgroups. Safety results showed that tirbanibulin ointment was well tolerated. Adverse events were few. Treatment related adverse events were mild to moderate application site symptoms, such as pruritus or pain. There were no serious adverse events or early discontinuations due to study drug related adverse events. Local skin reactions (erythema, flaking/scaling, crusting, swelling, vesiculation/postulation and erosion/ulceration) were mostly mild to moderate. We believe that this product, if approved by regulatory authorities, could have a major impact in the medical treatment of AK.

Table 1: Efficacy Results of Tirbanibulin Ointment 1% in the Field Treatment of Actinic Keratosis

Study	KX01-AK-003			KX01-AK-004		
% of Subjects in the Intent-To-Treat Population (Number of Subjects)	Tirbanibulin N=175	Vehicle N=176	p-value	Tirbanibulin N=178	Vehicle N=173	p-value
100% AK Clearance on Day 57	**44% (N=77)**	**5% (N=8)**	**<0.0001[a]**	**54% (N=97)**	**13% (N=22)**	**<0.0001[a]**
Face	50%	6%	<0.0001	61%	14%	<0.0001
Scalp	30%	2%	<0.0001	41%	11%	0.0003
□75% AK Clearance on Day 57	68%	16%	<0.0001[a]	76%	20%	<0.0001[a]

Note:
a = p-value calculated based on Cochran-Mantel-Haenszel (CMH)

Corporate Information

We were originally formed under the laws of the state of Delaware in November 2003 under the name Kinex Pharmaceuticals, LLC. In December 2012, we converted from a limited liability company to a Delaware corporation, Kinex Pharmaceuticals, Inc. In August 2015, we amended and restated our certificate of incorporation to change our name to Athenex, Inc. Our principal executive offices are located at 1001 Main Street, Suite 600, Buffalo, NY 14203, and our telephone number is (716) 427-2950. Our website address is www.athenex.com. The information contained on, or that can be accessed through, our website is not a part of this prospectus. We have included our website address in this prospectus solely as an inactive textual reference.

The Offering

This prospectus is part of a registration statement that we filed with the SEC utilizing a shelf registration process. Under this shelf registration process, the Selling Stockholders may, from time to time, offer and sell up to an aggregate of 10,000,000 shares of Common Stock in one or more offerings. The shares of Common Stock may be offered and sold by the Selling Stockholders through public or private transactions, at market prices prevailing at the time of sale or at negotiated prices. The Selling Stockholders may retain underwriters, dealers or agents from time to time. We do not expect to provide a prospectus supplement containing further information regarding the resale of our Common Stock by the Selling Stockholders.

RISK FACTORS

Investing in our securities involves a high degree of risk. Before making an investment decision, you should carefully consider the risks described under "Risk Factors" in our most recent Annual Report on Form 10-K and any updates in our Quarterly Reports on Form 10-Q filed with the SEC, which are incorporated by reference into this prospectus and any prospectus supplement we may file. Our business, financial condition, results of operations and prospects could be materially adversely affected by any of these risks. The trading price of our securities could decline due to any of these risks, and you may lose all or part of your investment. The risks referred to above are not the only ones that may exist. For further details, see the sections entitled "Where You Can Find More Information" and "Incorporation by Reference."

USE OF PROCEEDS

We will not receive any proceeds from the shares of our Common Stock offered for resale by the Selling Stockholders.

SELLING STOCKHOLDERS

This prospectus covers the resale from time to time by the Selling Stockholders identified in the table below of an aggregate of up to 10,000,000 shares of our Common Stock. None of the Selling Stockholders are licensed broker-dealers or affiliates of licensed broker-dealers. Other than as described in the table below, the Selling Stockholders and their affiliates have not held a position or office, or had any material relationship, with us within the last three years.

The table below (1) lists the Selling Stockholders and other information regarding the beneficial ownership (as determined under Section 13(d) of the Exchange Act and the rules and regulations thereunder) of our Common Stock by the Selling Stockholders; (2) has been prepared based upon information furnished to us by the Selling Stockholders; and (3) to our knowledge, is accurate as of the date of this prospectus. The Selling Stockholders may sell all, some or none of their securities in this offering. The Selling Stockholders identified in the table below may have sold, transferred or otherwise disposed of some or all of their securities since the date of this prospectus in transactions exempt from or not subject to the registration requirements of the Securities Act. Information concerning the Selling Stockholders may change from time to time and, if necessary, we will amend or supplement this prospectus accordingly and as required.

Selling Stockholder	Number of Shares Beneficially Owned Prior to the Offering	Percentage of Common Stock Beneficially Owned Prior to this Offering(1)	Maximum Number of Shares to be sold in this Offering	Number of Shares Beneficially Owned After the Offering(2)	Percentage of Common Stock Beneficially Owned After this Offering(1)
Perceptive Life Sciences Master Fund, Ltd.(3)	10,247,118(4)	13.3%	4,000,000	6,247,118(4)	8.1%
Avoro Capital Advisors (formerly known as venBio Select Advisor)	4,552,841	5.9%	3,000,000	1,552,841	2.0%
OrbiMed Partners Master Fund Limited	2,500,000	3.2%	2,500,000	—	—
The Biotech Growth Trust PLC	930,000	1.2%	500,000	430,000	0.6%

(1) Percentage ownership for the Selling Stockholders is determined in accordance with Section 13(d) of the Exchange Act and the rules and regulations thereunder and is based on 77,274,925 outstanding shares of our Common Stock as of July 16, 2019.

(2) The totals reported in this column assume that (a) all of the securities registered by the registration statement of which this prospectus is a part are sold in this offering; (b) the Selling Stockholders do not (i) sell any of the securities, if any, that have been issued to them other than those covered by this prospectus; and (ii) acquire additional shares of our Common Stock after the date of this prospectus and prior to the completion of this offering.

(3) Perceptive Advisors LLC, the investment manager to Perceptive Life Sciences Master Fund, Ltd. ("Perceptive") is the beneficial owner of greater than 5% of our outstanding shares of Common Stock. In addition, we are party to a 5-year, $50 million secured loan agreement with an affiliate of Perceptive which bears interest at a floating rate per annum equal to the London Interbank Offering Rate (with a floor of 2%) plus 9% and is secured by substantially all of the Company's assets and guaranteed by certain of the Company's subsidiaries. Under the loan agreement, the Company is required to make monthly interest-only payments with a bullet payment of the principal at maturity in June 2023.

(4) Includes a warrant to purchase 425,000 shares of our Common Stock at an exercise price of $18.66 per share held by an affiliate of Perceptive.

PLAN OF DISTRIBUTION

The Selling Stockholders, which as used herein includes donees, pledgees, transferees or other successors-in-interest selling shares of Common Stock or interests in shares of Common Stock received after the date of this prospectus from a Selling Stockholder as a gift, pledge, partnership distribution or other transfer, may, from time to time, sell, transfer or otherwise dispose of any or all of their shares of Common Stock or interests in shares of Common Stock on any stock exchange, market or trading facility on which the shares are traded or in private transactions. These dispositions may be at fixed prices, at prevailing market prices at the time of sale, at prices related to the prevailing market price, at varying prices determined at the time of sale, or at negotiated prices.

The Selling Stockholders may use any one or more of the following methods when disposing of shares or interests therein:

- 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;
- short sales effected after the date the registration statement of which this prospectus is a part is declared effective by the SEC;
- through the writing or settlement of options or other hedging transactions, whether through an options exchange or otherwise;
- broker-dealers may agree with the Selling Stockholders to sell a specified number of such shares at a stipulated price per share;
- a combination of any such methods of sale; or
- any other method permitted by applicable law.

The Selling Stockholders may, from time to time, pledge or grant a security interest in some or all of the shares of Common 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, under this prospectus, or under an amendment to this prospectus under Rule 424(b)(3) or other applicable provision of the Securities Act amending 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 the shares of Common Stock in other circumstances, in which case the transferees, pledgees or other successors in interest will be the selling beneficial owners for purposes of this prospectus.

In connection with the sale of our Common Stock or interests therein, 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 Common Stock in the course of hedging the positions they assume. The Selling Stockholders may also sell shares of our Common Stock short and deliver these securities to close out their short positions, or loan or pledge the Common Stock to broker-dealers that in turn may sell these securities. 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).

The aggregate proceeds to the Selling Stockholders from the sale of the Common Stock offered by them will be the purchase price of the Common Stock less discounts or commissions, if any. Each of the Selling Stockholders reserves the right to accept and, together with their agents from time to time, to reject, in whole or in part, any proposed purchase of Common Stock to be made directly or through agents. We will not receive any of the proceeds from this offering.

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, provided that they meet the criteria and conform to the requirements of that rule.

We may suspend the sale of shares by the Selling Stockholders pursuant to this prospectus for certain periods of time for certain reasons, including if the prospectus is required to be supplemented or amended to include additional material information within the registration statement.

The Selling Stockholders and any underwriters, broker-dealers or agents that participate in the sale of the Common Stock or interests therein may be "underwriters" within the meaning of Section 2(11) of the Securities Act. Any discounts, commissions, concessions or profit they earn on any resale of the shares may be underwriting discounts and commissions 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 prospectus delivery requirements of the Securities Act.

To the extent required, the shares of our Common Stock to be sold, the names of the Selling Stockholders, the respective purchase prices and public offering prices, the names of any agents, dealer or underwriter, any applicable commissions or discounts with respect to a particular offer will be set forth in an accompanying prospectus supplement or, if appropriate, a post-effective amendment to the registration statement that includes this prospectus.

In order to comply with the securities laws of some states, if applicable, the Common Stock may be sold in these jurisdictions only through registered or licensed brokers or dealers. In addition, in some states the Common Stock may not be sold unless it has been registered or qualified for sale or an exemption from registration or qualification requirements is available and is complied with.

We have advised the Selling Stockholders that the anti-manipulation rules of Regulation M under the Exchange Act may apply to sales of shares in the market and to the activities of the Selling Stockholders and their affiliates. In addition, to the extent applicable we will make copies of this prospectus (as it may be supplemented or amended from time to time) available to the Selling Stockholders for the purpose of satisfying the prospectus delivery requirements of the Securities Act. The Selling Stockholders may indemnify any broker-dealer that participates in transactions involving the sale of the shares against certain liabilities, including liabilities arising under the Securities Act.

We have agreed to indemnify the Selling Stockholders against liabilities, including liabilities under the Securities Act and state securities laws, relating to the registration of the shares offered by this prospectus.

We have agreed with the Selling Stockholders to keep the registration statement of which this prospectus constitutes a part effective until the earlier of (1) 120 days after the registration statement becomes effective or (2) such time as all of the shares covered by this prospectus have been disposed of pursuant to and in accordance with the registration statement.

LEGAL MATTERS

The validity of the securities offered hereby will be passed upon for us by Harter Secrest & Emery LLP, Rochester, New York.

EXPERTS

The consolidated financial statements and consolidated financial statement schedule incorporated in this prospectus by reference from the Company's Annual Report on Form 10-K for the year ended December 31, 2018 have been audited by Deloitte & Touche LLP, an independent registered public accounting firm, as stated in their report (which report expresses an unqualified opinion on the consolidated financial statements and includes an explanatory paragraph regarding a going concern uncertainty), which is incorporated herein by reference. Such consolidated financial statements and consolidated financial statement schedule have been so incorporated in reliance upon the report of such firm given upon their authority as experts in accounting and auditing.

INCORPORATION BY REFERENCE

The SEC allows us to incorporate by reference information into this prospectus and any accompanying prospectus supplement from other documents that we file with it, which means that we can disclose important information to you by referring you to those documents. The information incorporated by reference is considered to be part of this prospectus. Information in this prospectus supersedes information incorporated by reference that we filed with the SEC prior to the date of this prospectus, while information that we file later with the SEC will automatically update and supersede the information in this prospectus. We incorporate by reference into this prospectus and the registration statement of which this prospectus is a part the information or documents listed below that we have filed with the SEC, except for information "furnished" under Items 2.02 or 7.01 and any related Items 9.01 on Form 8-K or other information "furnished" to the SEC which is not deemed filed and not incorporated in this prospectus, until the termination of the offering of securities described in this prospectus:

- Annual Report on Form 10-K for the fiscal year ended December 31, 2018, filed with the SEC on March 11, 2019 (the "Form 10-K");
- Definitive Proxy Statement on Schedule 14A, filed with the SEC on April 25, 2019, to the extent incorporated into our Form 10-K;
- Quarterly Report on Form 10-Q for the quarterly period ended March 31, 2019, filed with the SEC on May 9, 2019;
- Current reports on Form 8-K filed with the SEC on January 3 , March 6, March 7, March 21, March 29, April 2, May 6, June 6, and June 13, 2019; and
- The description of our Common Stock contained in our registration statement on Form 8-A, filed with the SEC on June 12, 2017, and any amendment or report filed for the purpose of updating such description.

We also incorporate by reference any future filings (other than current reports furnished under Item 2.02 or Item 7.01 of Form 8-K and exhibits filed on such form that are related to such items unless such Form 8-K expressly provides to the contrary) made with the SEC pursuant to Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act, including those made after the date of the initial filing of the registration statement of which this prospectus is a part and prior to effectiveness of such registration statement, until we file a post-effective amendment that indicates the termination of the offering of the securities made by this prospectus, which will become a part of this prospectus from the date that such documents are filed with the SEC. Information in such future filings updates and supplements the information provided in this prospectus. Any statements in any such

future filings will automatically be deemed to modify and supersede any information in any document we previously filed with the SEC that is incorporated or deemed to be incorporated herein by reference to the extent that statements in the later-filed document modify or replace such earlier statements.

We will furnish without charge to each person, including any beneficial owner, to whom a prospectus is delivered, upon written or oral request, a copy of any or all of the documents incorporated by reference into this prospectus but not delivered with the prospectus, including exhibits that are specifically incorporated by reference into such documents. You should direct any requests for documents to:

Athenex, Inc.
1001 Main Street, Suite 600
Buffalo, NY 14203
(716) 427-2950

WHERE YOU CAN FIND MORE INFORMATION

We file annual, quarterly and current reports, proxy statements and other information with the SEC. Our SEC filings are available to the public over the Internet at the SEC's website at http://www.sec.gov. Copies of certain information filed by us with the SEC are also available on our website at www.athenex.com. Our website is not a part of this prospectus and is not incorporated by reference in this prospectus.

This prospectus is part of a registration statement we filed with the SEC. This prospectus omits some information contained in the registration statement in accordance with SEC rules and regulations. You should review the information and exhibits in the registration statement for further information about us and our consolidated subsidiaries and the securities we are offering. Statements in this prospectus concerning any document we filed as an exhibit to the registration statement or that we otherwise filed with the SEC are not intended to be comprehensive and are qualified by reference to these filings. You should review the complete document to evaluate these statements.

ATHENEX, INC.

10,000,000 Shares of Common Stock Offered by the Selling Stockholders

PROSPECTUS

July 23, 2019

We have not authorized any dealer, salesperson or other person to give any information or represent anything not contained in or incorporated by reference into this prospectus. You must not rely on any unauthorized information. If anyone provides you with different or inconsistent information, you should not rely on it. This prospectus does not offer to sell any shares in any jurisdiction where it is unlawful. Neither the delivery of this prospectus, nor any sale made hereunder, shall create any implication that the information in this prospectus is correct after the date hereof.

PART II

INFORMATION NOT REQUIRED IN PROSPECTUS

Item 14. Other Expenses of Issuance and Distribution

The expenses relating to the registration of the securities will be borne by the registrant. Such expenses are estimated to be as follows:

Item	
SEC registration fee	$23,247
Legal fees and expenses*	15,000
Accounting fees and expenses*	17,000
Printing and miscellaneous fees and expenses*	4,753
Total	**$60,000**

* Indicatesan estimate

Item 15. Indemnification of Directors and Officers

Under Section 145 of the Delaware General Corporation Law, we can indemnify our directors and officers against liabilities they may incur in such capacities, including liabilities under the Securities Act of 1933, as amended. Our amended and restated certificate of incorporation provides that we must indemnify our directors and officers to the fullest extent permitted by law and requires us to pay expenses incurred in defending or otherwise participating in any proceeding in advance of its final disposition upon our receipt of an undertaking by the director or officer to repay such advances if it is ultimately determined that the director or officer is not entitled to indemnification. Our certificate of incorporation further provides that rights conferred under such certificate of incorporation do not exclude any other right such persons may have or acquire under the certificate of incorporation, the bylaws, any statute, agreement, vote of stockholders or disinterested directors or otherwise.

The amended and restated certificate of incorporation also provides that, pursuant to Delaware law, our directors shall not be liable for monetary damages for breach of the directors' fiduciary duty of care to us and our stockholders. This provision in the amended and restated certificate of incorporation does not eliminate the duty of care, and in appropriate circumstances equitable remedies such as injunctive or other forms of non-monetary relief will remain available under Delaware law. In addition, each director will continue to be subject to liability for breach of the director's duty of loyalty to us for acts or omissions not in good faith or involving intentional misconduct, or knowing violations of law, for actions leading to improper personal benefit to the director, and for payment of dividends or approval of stock repurchases or redemptions that are unlawful under Delaware law. The provision also does not affect a director's responsibilities under any other law, such as the federal securities laws or state or federal environmental laws. We also maintain directors' and officers' liability insurance that provides coverage (1) to our directors and officers against loss arising from claims arising from or incurred as a result of such service and (2) to us with respect to indemnification payments that we may make to our directors and officers.

In addition, we have agreements to indemnify our directors and certain of our officers in addition to the indemnification provided for in the amended and restated certificate of incorporation. These agreements, among other things, indemnify our directors and some of our officers for certain expenses (including attorneys' fees), judgments, fines and settlement amounts incurred by such person in any action or proceeding, including any action by or in our right, on account of services by that person as a director or officer of our company or as a director or officer of our subsidiary, or as a director or officer of any other company or enterprise that the person provides services to at our request.

Item 16. Exhibits

The exhibits to the registration statement are listed in the Exhibit Index attached hereto and incorporated by reference herein.

Item 17. Undertakings

(a) The undersigned registrant hereby undertakes:

(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 Commission pursuant to Rule 424(b) if, in the aggregate, the changes in volume and price represent no more than 20 percent change in the maximum aggregate offering price set forth in the "Calculation of Registration Fee" table in the effective registration statement;

(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 the undertakings set forth in paragraphs (a)(1)(i), (a)(1)(ii) and (a)(1)(iii) above 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 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 a 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 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) 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

(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.

(b) The undersigned registrant hereby undertakes 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 that is incorporated by reference in this 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.

(c) Insofar as indemnification for liabilities arising under the Securities Act 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 and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by a registrant for expenses incurred or paid by a director, officer, or controlling person 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 and will be governed by the final adjudication of such issue.

EXHIBIT INDEX

Exhibit Number	Description	Location
4.1	Share Purchase Agreement, by and among Athenex, Inc., Perceptive Life Sciences Master Fund, Ltd., venBio Select Fund LLC, OrbiMed Partners Master Fund Limited, and The Biotech Growth Trust PLC, dated as of May 3, 2019	Incorporated by reference to Exhibit 10.1 to the Company's Form 8-K, filed with the SEC on May 6, 2019
4.2	Registration Rights Agreement, by and among Athenex, Inc., Perceptive Life Sciences Master Fund, Ltd., venBio Select Fund LLC, OrbiMed Partners Master Fund Limited, and The Biotech Growth Trust PLC, dated as of May 7, 2019	Filed herewith
5.1	Opinion of Harter Secrest & Emery LLP	Filed herewith
23.1	Consent of Deloitte & Touche LLP	Filed herewith
23.2	Consent of Harter Secrest & Emery LLP	Filed herewith (included in Exhibit 5.1)
24.1	Power of Attorney	Included on signature page

Table of Contents

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 the city of Buffalo, State of New York, on July 23, 2019.

ATHENEX, INC.

By: /s/ Johnson Y.N. Lau
Johnson Y.N. Lau
Chief Executive Officer and Board Chairman

KNOW ALL PERSONS BY THESE PRESENTS, the undersigned hereby constitute and appoint Johnson Y.N. Lau and Teresa Bair and each of them, his true and lawful attorney-in-fact and agent, each with full power of substitution and resubstitution, for him and in his name, place and stead, in any and all capacities, to sign any and all amendments (including post-effective amendments) to this registration statement, or any related registration statement filed pursuant to Rule 462(b) under the Securities Act, and to file the same, with 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 connection therewith, as fully to all intents and purposes as he might or could do in person, hereby ratifying and confirming all that each of said attorneys-in-fact and agents, or his substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

IN WITNESS WHEREOF, each of the undersigned has executed this power of attorney as of the date indicated.

Pursuant to the requirements of the Securities Act of 1933, as amended, this Registration Statement on Form S-3 has been signed by the following persons in the capacities and on the dates indicated:

Signature	Title	Date
/s/ Johnson Y.N. Lau Johnson Y.N. Lau	Chief Executive Officer and Board Chairman (Principal Executive Officer)	July 23, 2019
/s/ Randoll Sze Randoll Sze	Chief Financial Officer	July 23, 2019
/s/ Kim Campbell Kim Campbell	Director	July 23, 2019
/s/ Manson Fok Manson Fok	Director	July 23, 2019
/s/ Benson Kwan Hung Tsang Benson Kwan Hung Tsang	Director	July 23, 2019
/s/ Jinn Wu Jinn Wu	Director	July 23, 2019
/s/ John Moore Vierling, M.D. John Moore Vierling, M.D.	Director	July 23, 2019
/s/ Jordan Kanfer Jordan Kanfer	Director	July 23, 2019
/s/ Stephanie Davis Stephanie Davis	Director	July 23, 2019
/s/ John Tiong Lu Koh John Tiong Lu Koh	Director	July 23, 2019

Exhibit 4.2

EXECUTION VERSION

REGISTRATION RIGHTS AGREEMENT

dated as of May 7, 2019

by and among

ATHENEX, INC.,

PERCEPTIVE LIFE SCIENCES MASTER FUND, LTD.

VENBIO SELECT FUND LLC

ORBIMED PARTNERS MASTER FUND LIMITED

and

THE BIOTECH GROWTH TRUST PLC

TABLE OF CONTENTS

REGISTRATION RIGHTS AGREEMENT

THIS REGISTRATION RIGHTS AGREEMENT (this "**Agreement**") is made and entered into as of May 7, 2019 by and among (i) Athenex, Inc., a Delaware corporation (the "**Company**"), and (ii) Perceptive Life Sciences Master Fund, Ltd., a Cayman Islands exempted company, venBio Select Fund LLC, a Delaware limited liability company, OrbiMed Partners Master Fund Limited, a Bermuda exempted company, and The Biotech Growth Trust PLC, a a United Kingdom investment trust (each, an **"Investor"** and, together, the "**Investors**").

RECITALS

WHEREAS, the Investors have agreed to purchase from the Company, and the Company has agreed to sell to the Investors, shares of common stock, par value US$0.001 per share (the "**Common Stock**") of the Company, on the terms and conditions set forth in the Share Purchase Agreement dated as of May 3, 2019 between the Company and the Investors (the "**Share Purchase Agreement**"); and

WHEREAS, it is a condition to the Closing that the parties hereto enter into this Agreement to set forth certain rights and obligations of the parties hereto in connection with the transactions contemplated under the Share Purchase Agreement.

NOW, THEREFORE, in consideration of the premises set forth above, the mutual promises and covenants set forth herein and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties hereby agree as follows:

ARTICLE I
DEFINITIONS AND INTERPRETATION

Section 1.1 Definitions. In this Agreement, except to the extent otherwise provided or that the context otherwise requires:

"**Affiliate**" means, in respect of a Person, any other Person that, directly or indirectly, through one or more intermediaries, controls, is controlled by, or is under common control with, such Person, and (i) in the case of a natural person, shall include, without limitation, such Person's spouse, parents, children, siblings, mother-in-law and father-in-law and brothers and sisters-in-law, (ii) in the case of a Shareholder, shall include (A) any Person who holds shares as a nominee for such Shareholder, (B) any shareholder of such Shareholder, (C) any Person which has a direct and indirect interest in such Shareholder (including, if applicable, any general partner or limited partner) or any fund manager thereof; (D) any Person that directly or indirectly controls, is controlled by, under common control with, or is managed by such Shareholder or its fund manager, (E) the relatives of any individual referred to in (B) above, and (F) any trust controlled by or held for the benefit of such individuals. For the purpose of this definition, "control" (and correlative terms) shall mean the direct or indirect power, whether by contract, equity ownership or otherwise, to direct the policies or management of a Person, provided that the direct or indirect ownership of twenty-five percent (25%) or more of the voting power of a Person is deemed to constitute control of that Person;

"**Agreement**" has the meaning set forth in the Preamble;

"**Articles**" means the Company's Certificate of Incorporation, as amended from time to time;

"**beneficial ownership**" or "**beneficially own**" or similar term means beneficial ownership as defined under Rule 13d-3 under the Exchange Act;

"**Board**" and "**Board of Directors**" means the Board of Directors of the Company;

"**Business Day**" has the meaning as defined in the Articles;

"**Claim Notice**" has the meaning set forth in Section 2.9(c);

"**Closing**" means the closing of the transactions contemplated under the Share Purchase Agreement, being the date hereof;

"**Commission**" means the United States Securities and Exchange Commission or any other federal agency at the time administering the Securities Act or other governmental agency administering the securities laws in the jurisdiction in which the Company's securities are registered or being registered;

"**Common Stock**" has the meaning set forth in the Recitals;

"**Company**" has the meaning set forth in the Preamble;

"**Confidential Information**" has the meaning set forth in Section 3.1;

"Director(s)" means the director(s) of the Company;

"**Email**" has the meaning set forth in Section 3.3;

"**Exchange Act**" means the U.S. Securities Exchange Act of 1934, as amended;

"**Form S-3**" has the meaning set forth in Section 2.4(a);

"**Group Company**" means the Company's material subsidiaries, material consolidated affiliated entities and their material subsidiaries and "Group Companies" shall mean all of them;

"**Hong Kong**" means the Hong Kong Special Administrative Region of the People's Republic of China;

"**Investor**" and **"Investors"** have the meaning set forth in the Preamble;

"**Nasdaq**" means the Nasdaq Global Select Market;

"Perceptive" means Perceptive Life Sciences Master Fund, Ltd., a Cayman Islands exempted company, which is an Investor.

"**Permitted Transferee**" has the meaning set forth in Section 3.8;

"**Person**" means an individual, corporation, partnership, limited liability company, association, trust, unincorporated organization, or other entity;

"**Prospectus**" means (i) the prospectus included in any Registration Statement, as amended or supplemented by any prospectus supplement, with respect to the terms of the offering of any portion of the Registrable Securities covered by such Registration Statement and by all other amendments and supplements to the prospectus, including post-effective amendments and all material incorporated by reference in such prospectus, and (ii) any "free writing prospectus" as defined in Rule 405 under the 1933 Act.

"**register**," "**registered**" and "**registration**" means (i) a registration effected by preparing and filing a registration statement in compliance with the Securities Act, and the declaration or ordering of the effectiveness of such registration statement, or (ii) in the context of a public offering in a jurisdiction other than the United States, a registration, qualification or filing under the applicable securities laws of such other jurisdiction;

"**Registrable Securities**" means (i) the Subject Shares, and (ii) shares of the Common Stock of the Company issued as a dividend or other distribution with respect to, or in exchange for or in replacement of, any of the Subject Shares, directly, or indirectly, whether by merger, amendment to Articles, stock split, dividend, recapitalization, or otherwise. Notwithstanding the foregoing, "**Registrable Securities**" shall not include any Registrable Securities sold by a Person in a transaction in which rights under Section 2 are not assigned in accordance with this Agreement or any Registrable Securities sold in a public offering, whether sold pursuant to Rule 144, or in a registered offering, or otherwise;

"**Registration Expenses**" means all expenses incurred by the Company in complying with Section 2.4 hereof, including, without limitation, all registration, qualification and filing fees, printing expenses, escrow fees, fees and disbursements of counsel for the Company, blue sky fees and expenses, the expense of any special audits incident to or required by any such registration and the reasonable fees and disbursements of one counsel for the Investor (which fees and disbursements of counsel shall be subject to an aggregate cap of US$35,000), and any fee charged by any depositary bank, transfer agent or share registrar, but excluding Selling Expenses. For the avoidance of doubt, the Company shall pay all expenses incurred in connection with a registration pursuant to Section 2 notwithstanding the cancellation or delay of the registration proceeding for any reason;

"**Restricted Securities**" means the securities of the Company required to bear the legend set forth in Section 2.2 hereof;

"**Rule 144**" has the meaning set forth in Section 2.3;

"**Securities**" means any share of the Common Stock or any equity interest of, or shares of any class in the share capital (common, preferred or otherwise) of, the Company and any convertible securities, options, warrants and any other type of equity or equity-linked securities convertible, exercisable or exchangeable for any such equity interest or shares of any class in the share capital of the Company;

"**Securities Act**" means the United States Securities Act of 1933 as amended from time to time, also referred to herein as the "**Act**";

"**Selling Expenses**" means all underwriting discounts and selling commissions;

"**Share Purchase Agreement**" has the meaning set forth in the Recitals;

"**Shareholder**" or "**Shareholders**" means Persons who hold the shares of the Common Stock from time to time;

"**Subject Shares**" means the shares of the Common Stock issued to the Investors at the Closing; provided, however, that for the avoidance of doubt, the term "Subject Shares" does not include any shares of Common Stock sold to Perceptive pursuant to a Share Purchase Agreement dated as of June 29, 2018 between the Company and Perceptive, which are subject to a Registration Rights Agreement, dated as of July 3, 2018, between the Company and Perceptive;

"**Transaction Documents**" means this Agreement, the Share Purchase Agreement, and each of the other agreements and documents entered into or delivered by the parties hereto in connection with the transactions contemplated hereby or thereby;

"**Violation**" has the meaning set forth in Section 2.9(a); and

Section 1.2 Interpretation and Rules of Construction. In this Agreement, except to the extent otherwise provided or that the context otherwise requires:

(a) when a reference is made in this Agreement to an Article or Section, such reference is to an Article or Section of this Agreement;

(b) the headings for this Agreement are for reference purposes only and do not affect in any way the meaning or interpretation of this Agreement;

(c) the words "hereof," "herein" and "hereunder" and words of similar import, when used in this Agreement, refer to this Agreement as a whole and not to any particular provision of this Agreement;

(d) all terms defined in this Agreement have the defined meanings when used in any certificate or other document made or delivered pursuant hereto, unless otherwise defined therein;

(e) the definitions contained in this Agreement are applicable to the singular as well as the plural forms of such terms; and

(f) references to a Person are also to its successors and permitted assigns.

ARTICLE II
TRANSFER RESTRICTIONS; REGISTRATION RIGHTS

Section 2.1 Transfer Restrictions

The Restricted Securities (including the Subject Shares) shall not be sold, assigned, transferred or pledged except upon the conditions specified in this Section 2, which conditions are intended to, *inter alia*, ensure compliance with the provisions of applicable securities laws. Each Investor will cause any proposed purchaser, assignee, transferee or pledgee of any such shares held by such holder to agree in writing to take and hold such securities subject to the provisions and upon the conditions specified in this Agreement.

Section 2.2 Restrictive Legend; Execution by the Company.

(a) Each certificate (if any) representing the Subject Shares, and any replacement securities issued in respect of the Subject Shares, shall (unless otherwise permitted by the provisions of Section 2.3 below) be stamped or otherwise imprinted with legends substantially in the following form (in addition to any legend required under applicable federal, state, local or non-United States law):

(i) "THE SECURITIES REPRESENTED BY THIS INSTRUMENT HAVE NOT BEEN REGISTERED UNDER THE UNITED STATES SECURITIES ACT OF 1933, AS AMENDED, OR THE SECURITIES LAWS OF ANY STATE AND MAY NOT BE TRANSFERRED, SOLD, OFFERED FOR SALE, PLEDGED, HYPOTHECATED OR OTHERWISE DISPOSED OF EXCEPT WHILE A REGISTRATION STATEMENT RELATING THERETO IS IN EFFECT UNDER SUCH ACT AND APPLICABLE STATE SECURITIES LAWS OR PURSUANT TO AN EXEMPTION FROM REGISTRATION UNDER SUCH ACT AND SUCH LAWS. ANY ATTEMPT TO TRANSFER, SELL, OFFER TO SELL, PLEDGE, HYPOTHECATE OR OTHERWISE DISPOSE OF THIS INSTRUMENT IN VIOLATION OF THESE RESTRICTIONS SHALL BE VOID."

(ii) "THE SHARES REPRESENTED BY THIS CERTIFICATE ARE SUBJECT TO AND MAY ONLY BE SOLD, DISPOSED OF OR OTHERWISE TRANSFERRED IN COMPLIANCE WITH THE REGISTRATION RIGHTS AGREEMENT, DATED MAY 7, 2019 AND THE SHARE PURCHASE AGREEMENT, DATED MAY 3, 2019, ENTERED INTO BY THE HOLDER OF THESE SHARES AND THE COMPANY. COPIES OF SUCH AGREEMENTS ARE ON FILE AT THE PRINCIPAL OFFICE OF THE COMPANY. THESE RESTRICTIONS ARE BINDING ON TRANSFEREES OF THESE SHARES. BY ACCEPTING ANY INTEREST IN SUCH SHARES THE PERSON ACCEPTING SUCH INTEREST SHALL BE DEEMED TO AGREE TO AND SHALL BECOME BOUND BY ALL THE PROVISIONS OF SAID AGREEMENTS AS APPLICABLE."

(b) The Investors consent to the Company making a notation on its records and giving instructions to any transfer agent of the Restricted Securities in order to implement the restrictions on transfer established in this Section 2.2.

(c) The Company agrees that it will cause the certificates evidencing the shares of the Common Stock to bear the legend required by this Section 2.2, and it shall supply, free of

charge, a copy of this Agreement to any holder of a certificate evidencing shares of the Common Stock containing such legend upon written request from such holder to the Company at its principal office. The parties hereto do hereby agree that the failure to cause the certificates evidencing the appropriate shares of the Common Stock to bear the legend required by this Section 2.2 and/or failure of the Company to supply, free of charge, a copy of this Agreement as provided under this Section 2.2 shall not affect the validity or enforcement of this Agreement.

Section 2.3 Notice of Proposed Transfers.

The holder of each certificate representing the Subject Shares by acceptance thereof agrees to comply in all respects with the provisions of this Section 2.3. Prior to any proposed sale, assignment, transfer or pledge of any Subject Shares (other than (a) a transfer not involving a change in beneficial ownership, (b) in transactions involving the distribution without consideration of the Subject Shares by the holder to any of its partners, members, or retired partners or members, or to the estate of any of its partners or members or retired partners or members, (c) in transactions in compliance with Rule 144 promulgated under the Securities Act ("**Rule 144**"), (d) transfers by members that are entities to affiliated entities or funds (United States based or non-United States based), and (e) transfers to the Company by any holder of the Subject Shares pursuant to the Company's repurchase option set forth in any agreement entered into as of or after the date hereof if such agreement is approved by a majority of the Board), each Investor shall give written notice to the Company of such Investor's intention to effect such transfer, sale, assignment or pledge. Each such notice shall describe the manner and circumstances of the proposed transfer, sale, assignment or pledge in sufficient detail, and if reasonably requested by the Company, shall be accompanied, at such holder's expense, by either (a) a written opinion of legal counsel who shall be, and whose legal opinion shall be, reasonably satisfactory to the Company addressed to the Company, to the effect that the proposed transfer of the Subject Shares may be effected without registration under the Securities Act, or (b) a "no action" letter from the Commission to the effect that the transfer of such securities without registration will not result in a recommendation by the staff of the Commission that action be taken with respect thereto, whereupon the holder of such Subject Shares shall be entitled to transfer such Subject Shares in accordance with the terms of the notice delivered by the holder to the Company. For the avoidance of doubt, it shall not be reasonable for the Company to request that a notice be accompanied by any such opinion or "no action" letter if, among other things, both the transferor and the transferee have certified in writing that each of them is not a U.S. Person (as defined under Rule 902 of Regulation S promulgated under the Securities Act). Notwithstanding any of the foregoing exceptions to the notice requirements, all transferees shall be bound by the obligations of the transferor in this Agreement. Each certificate evidencing the Restricted Securities transferred as above provided shall bear, except if such transfer is made pursuant to Rule 144, the appropriate restrictive legends set forth in Section 2.2 above, except that such certificate shall not bear such restrictive legends if in the opinion of counsel for such holder and the Company such legend is not required in order to establish compliance with any provision of the Securities Act.

Section 2.4 Registration.

(a) Promptly following the date of the Closing (the "**Closing Date**") but no later than ninety (90) days after the Closing Date (the "**Filing Deadline**"), the Company shall prepare and file with the Commission one registration statement on Form S-3 (or, if Form S-3 is

not then available to the Company, on Form S-1) (the "**Registration Statement**") covering the resale of the Registrable Securities. Subject to any Commission comments, such Registration Statement shall include the plan of distribution attached hereto as Exhibit A; provided, however, that no Investor shall be named as an "underwriter" in the Registration Statement without such Investor's prior written consent. Such Registration Statement shall not include any shares of Common Stock or other securities for the account of any other holder without the prior written consent of the Investors. The Registration Statement (and each amendment or supplement thereto, and each request for acceleration of effectiveness thereof) shall be provided to the Investors and their respective counsel for reasonable advance comment prior to its filing or other submission.

(b) Expenses. The Company shall pay all Registration Expenses incurred in connection with each registration requested pursuant to this Section 2.4. Each Investor shall bear its proportionate share (based upon the total number of shares sold in such registration other than for the account of the Company) of any Selling Expenses incurred in connection with such registration of securities.

(c) Deferral. Notwithstanding the foregoing, if the Company shall furnish to the Investors a certificate signed by the CEO of the Company stating that in the good faith judgment of the Board, it would be materially detrimental to the Company and its shareholders for such registration statement to be filed, then the Company shall have the right to defer such filing for a period of not more than ninety (90) days; provided, however, that the Company may not utilize this right more than once; provided, further that during such ninety (90) day period, the Company shall not file any registration statement pertaining to the public offering of any securities of the Company.

Section 2.5 Effectiveness

(a) The Company shall use best efforts to have the Registration Statement declared effective as soon as practicable. The Company shall notify the Investors by facsimile or e-mail as promptly as practicable, and in any event, within twenty-four (24) hours, after any Registration Statement is declared effective and shall simultaneously provide the Investors with copies of any related Prospectus to be used in connection with the sale or other disposition of the securities covered thereby. If (A) a Registration Statement covering the Registrable Securities is not declared effective by the Commission prior to the earlier of (i) five (5) Business Days after the Commission shall have informed the Company that no review of the Registration Statement will be made or that the Commission has no further comments on the Registration Statement or (ii) the 120th day after the Closing Date (the 150th day if the Commission reviews the Registration Statement), or (B) after a Registration Statement has been declared effective by the Commission (the "**Effectiveness Deadline**"), sales cannot be made continuously pursuant to such Registration Statement for any reason (including without limitation by reason of a stop order, or the Company's failure to update the Registration Statement) (each such event, a "**Default**"). In the event that a Default occurs then, in addition to any other rights the Investors may have hereunder or under applicable law, on the first day of the occurrence of the Default, and on the same day of each succeeding month (if the applicable Default shall not have been cured by such date) until the applicable Default is cured, the Company shall pay to each Investor an amount in cash, as liquidated damages and not as a penalty ("**Liquidated Damages**"), equal to 1.0% of the aggregate purchase price paid by such Investor pursuant to the Share Purchase Agreement for any Registrable

Securities held by such Investor on the date of the Default and the same day of each succeeding month. The parties agree that in no event shall the aggregate amount of Liquidated Damages payable to the Investors exceed, in the aggregate, twenty-five percent (25%) of the aggregate purchase price paid by the Investors pursuant to the Share Purchase Agreement. If the Company fails to pay any Liquidated Damages pursuant to this Section 2.5(a) in full within five (5) Business Days after the date payable, the Company will pay interest thereon at a rate of 1.5% per month (or such lesser maximum amount that is permitted to be paid by applicable law) to the Investors, accruing daily from the date such Liquidated Damages are due until such amounts, plus all such interest thereon, are paid in full. The Liquidated Damages pursuant to the terms hereof shall apply on a daily pro-rata basis for any portion of a month prior to the cure of a Default, except in the case of the first occurrence of the Default. The Effectiveness Deadline for a Registration Statement shall be extended without default or Liquidated Damages hereunder in the event that the Company's failure to obtain the effectiveness of the Registration Statement on a timely basis results from the failure of any Investor to timely provide the Company with information requested by the Company and necessary to complete the Registration Statement in accordance with the requirements of the Securities Act (in which case the Effectiveness Deadline would be extended with respect to Registrable Securities held by the Investors).

(b) Rule 415; Cutback If at any time the Commission takes the position that the offering of some or all of the Registrable Securities in a Registration Statement is not eligible to be made on a delayed or continuous basis under the provisions of Rule 415 under the 1933 Act or requires any Investor to be named as an "underwriter", the Company shall use its commercially reasonable best efforts to persuade the Commission that the offering contemplated by the Registration Statement is a valid secondary offering and not an offering "by or on behalf of the issuer" as defined in Rule 415 and that no Investor is an "underwriter". The Investors shall have the right to participate or have their counsel participate in any meetings or discussions with the Commission regarding the Commission's position and to comment or have their counsel comment on any written submission made to the Commission with respect thereto. No such written submission shall be made to the Commission to which the Investors' counsel reasonably objects. In the event that, despite the Company's best efforts and compliance with the terms of this Section 2.5(b), the Commission refuses to alter its position, the Company shall (i) remove from the Registration Statement such portion of the Registrable Securities (the "**Cut Back Shares**") and/or (ii) agree to such restrictions and limitations on the registration and resale of the Registrable Securities as the Commission may require to assure the Company's compliance with the requirements of Rule 415 (collectively, the "**Commission Restrictions**"); provided, however, that the Company shall not agree to name any Investor as an "underwriter" in such Registration Statement without the prior written consent of such Investor. If and to the extent permitted by the Commission, the Cut-Back Shares shall be allocated among the Investors on a pro rata basis, in proportion to their respective Registrable Securities. No Liquidated Damages shall accrue as to any Cut Back Shares until such date as the Company is able to effect the registration of such Cut Back Shares in accordance with any Commission Restrictions (such date, the "**Restriction Termination Date**" of such Cut Back Shares). From and after the Restriction Termination Date applicable to any Cut Back Shares, all of the provisions of this Section 2 (including the Liquidated Damages provisions) shall again be applicable to such Cut Back Shares; provided, however, that (i) the Filing Deadline for the Registration Statement including such Cut Back Shares shall be ten (10) Business Days after such Restriction Termination Date, and (ii) the date by which the Company is required to obtain effectiveness with respect to such Cut Back Shares shall be the 90th

day immediately after the Restriction Termination Date. For the avoidance of doubt, for purposes of this Section 2.5(b), the term "best efforts" shall not require the Company to institute or maintain any action, suit or proceeding against the Commission or any member of the Staff of the Commission.

Section 2.6 Rights to Piggyback Registration

(a) If at any time following the date of this Agreement that any Registrable Securities remain outstanding (A) there is not one or more effective Registration Statements covering all of the Registrable Securities and (B) the Company proposes for any reason to register any shares of Common Stock under the 1933 Act (other than pursuant to a registration statement on Form S-4 or Form S-8 (or a similar or successor form)) with respect to an offering of Common Stock by the Company for its own account or for the account of any of its stockholders, it shall at each such time promptly give written notice to the holders of the Registrable Securities of its intention to do so (but in no event less than thirty (30) days before the anticipated filing date) and, to the extent permitted under the provisions of Rule 415 under the 1933 Act, include in such registration all Registrable Securities with respect to which the Company has received written requests for inclusion therein within fifteen (15) days after receipt of the Company's notice (a "**Piggyback Registration**"). Such notice shall offer the holders of the Registrable Securities the opportunity to register such number of shares of Registrable Securities as each such holder may request and shall indicate the intended method of distribution of such Registrable Securities.

(a) Notwithstanding the foregoing, (A) if such registration involves an underwritten public offering, the Investors must sell their Registrable Securities to, if applicable, the underwriter(s) at the same price and subject to the same underwriting discounts and commissions that apply to the other securities sold in such offering (it being acknowledged that the Company shall be responsible for other expenses as set forth in Section 2.4(b)) and subject to the Investors entering into customary underwriting documentation for selling stockholders in an underwritten public offering, and (B) if, at any time after giving written notice of its intention to register any Registrable Securities pursuant to Section 2.6(a) and prior to the effective date of the registration statement filed in connection with such registration, the Company shall determine for any reason not to cause such registration statement to become effective under the 1933 Act, the Company shall deliver written notice to the Investors and, thereupon, shall be relieved of its obligation to register any Registrable Securities in connection with such registration; provided, however, that nothing contained in this Section 2.6(b) shall limit the Company's liabilities and/or obligations under this Agreement, including, without limitation, the obligation to pay liquidated damages under Section 2.5. If the managing underwriter(s) for the underwritten public offering advise the Company that the number of shares proposed to be included in the offering exceeds the number that can reasonably be sold in the offering, then the shares to be included in such offering shall be allocated, first, to the account of the Company, in the event that the public offering relates to a primary offering by or on behalf of the Company, or, if the offering is being made pursuant to a demand registration rights granted to one or more holders of Common Stock, such holders, second, to the Investors (proportionally), and third, to any other holder of Common Stock having the right to include its shares in such offering.

Section 2.7 Obligations of the Company

Whenever required to effect the registration of any Registrable Securities under this Agreement, the Company shall keep the Investors advised in writing as to the initiation of such registration and as to the completion thereof, and shall, at its expense promptly:

(a) Registration Statement. Prepare and file with the Commission a registration statement with respect to such Registrable Securities and use its commercially reasonable efforts to cause such registration statement to become effective, and keep any such registration statement effective for a period of one hundred and twenty (120) days or until the Investors have completed the distribution described in the Registration Statement relating thereto, whichever occurs first.

(b) Amendments and Supplements. Prepare and file with the Commission such amendments and supplements to the Registration Statement and the Prospectus used in connection with such registration statement as may be necessary to comply with the provisions of the Securities Act or other applicable securities laws with respect to the disposition of all securities covered by such registration statement.

(c) Registration Statements and Prospectuses. Furnish to the Investors such number of copies of Registration Statements and Prospectuses, including a preliminary prospectus, in conformity with the requirements of the Securities Act or other applicable securities laws, and such other documents as it may reasonably request in order to facilitate the disposition of the Registrable Securities owned by it that are included in such registration.

(d) Blue Sky. Use its best efforts to register and qualify the securities covered by such registration statement under such other securities or blue sky laws of such jurisdictions as shall be reasonably requested by the Investors, provided that the Company shall not be required in connection therewith or as a condition thereto to qualify to do business or to file a general consent to service of process in any such states or jurisdictions.

(e) Notification. Notify the Investors at any time when a prospectus relating to its Registrable Securities is required to be delivered under the Securities Act or other applicable securities laws of the happening of any event as a result of which the prospectus included in such registration statement, as then in effect, includes an untrue statement of a material fact or omits to state a material fact required to be stated therein or necessary to make the statements therein not misleading in the light of the circumstances then existing.

(f) Listing on Securities Exchange(s). Cause all such Registrable Securities registered pursuant hereto to be listed on the Nasdaq, or such other internationally recognized exchange, for long as the Company's securities are listed on such exchange.

Section 2.8 Furnish Information.

It shall be a condition precedent to the obligations of the Company to take any action pursuant to Section 2.4 with respect to the Registrable Securities of the Investors, that the Investors shall furnish to the Company such information regarding itself, the Registrable Securities held by it and the intended method of disposition of such securities as shall be reasonably requested in writing by the Company to timely effect the registration of its Registrable Securities.

Section 2.9 Indemnification.

The following indemnification provisions shall apply in the event any Registrable Securities are included in a registration statement under Section 2.4:

(a) By the Company. To the extent permitted by law, the Company will indemnify and hold harmless each Investor, and the partners, officers, directors, employees, trustees and legal counsel of each Investor and each Person, if any, who controls an Investor within the meaning of Section 15 of the Securities Act against any expenses, losses, claims, damages, or liabilities (joint or several) (or actions in respect thereof) to which they may become subject under the Securities Act, the Exchange Act or other applicable law, insofar as such expenses, losses, claims, damages, or liabilities (or actions in respect thereof) arise out of or are based upon any of the following statements, omissions or violations (each a "**Violation**"):

(i) any untrue statement or alleged untrue statement of a material fact contained in any registration statement, offering circular, preliminary prospectus, final prospectus or other document, or any amendments or supplements thereto;

(ii) the omission or alleged omission to state therein a material fact required to be stated therein, or necessary to make the statements therein, in light of the circumstances in which they were made, not misleading; or

(iii) any violation or alleged violation of the Securities Act, the Exchange Act, any federal or state or foreign securities law or any rule or regulation promulgated under the Securities Act, the Exchange Act or other applicable securities law in connection with the offering covered by such registration statement; and the Company will reimburse the Investors, and their respective partners, officers, directors, employees, legal counsel or controlling Person for any legal or other expenses reasonably incurred by them, as incurred, in connection with investigating or defending any such loss, claim, damage, liability or action; provided, however, that the indemnity agreement contained in this Section 2.9(a) shall not apply to amounts paid in settlement of any such loss, claim, damage, liability or action if such settlement is effected without the consent of the Company (which consent shall not be unreasonably withheld), nor shall the Company be liable in any such case for any such loss, claim, damage, liability or action to the extent that it arises out of or is based upon a Violation which occurs in reliance upon and in conformity with written information furnished expressly for use in connection with such registration by the Investors, underwriter or controlling Person of Investor.

(b) By Investors. To the extent permitted by law, each Investor will indemnify and hold harmless the Company and the partners, officers, directors, employees, trustees and legal counsel of the Company and each Person, if any, who controls the Company within the meaning

of Section 15 of the Securities Act, and any other Shareholder selling securities under such registration statement or any of such other Shareholder's partners, directors, officers, employees, trustees and legal counsel of such Shareholder and each Person, if any, who controls such Shareholder within the meaning of Section 15 of the Securities Act, against any expenses, losses, claims, damages or liabilities (joint or several) (or actions in respect thereof) to which the Company or any such director, officer, employee, trustee, legal counsel, controlling Person or other such Shareholder, partner or director, officer, employee or controlling Person of such other Shareholder may become subject under the Securities Act, the Exchange Act or other applicable law, insofar as such expenses, losses, claims, damages or liabilities (or actions in respect thereto) arise out of or are based upon any Violation, in each case to the extent (and only to the extent) that such Violation occurs in reliance upon and in conformity with written information furnished by such Investor to the Company expressly for inclusion in the Registration Statement or Prospectus or amendment or supplement thereto, which constituted by the Investor an untrue statement of a material fact or any omission of a material fact required to be stated in the Registration Statement or Prospectus or preliminary Prospectus or amendment or supplement thereto or necessary to make the statements therein not misleading: and such Investor will reimburse any legal or other expenses reasonably incurred by the Company or any such director, officer, employee, controlling Person or other Shareholder, partner, officer, employee, director or controlling Person of such other Shareholder in connection with investigating or defending any such loss, claim, damage, liability or action: provided, however, that the indemnity agreement contained in this Section 2.9(b) shall not apply to amounts paid in settlement of any such loss, claim, damage, liability or action if such settlement is effected without the consent of such Investor, which consent shall not be unreasonably withheld; and provided, further that the total amounts payable in indemnity by such Investor under this Section 2.9(b) plus any amount under Section 2.9(e) in respect of any Violation shall not exceed the net proceeds received by such Investor in the registered offering out of which such Violation arises. For the avoidance of doubt, the Investors indemnification obligations pursuant to this Section are several and not joint.

(c) Notice. Promptly after receipt by an indemnified party under this Section 2.9 of notice of the commencement of any claim or action (including any governmental action), such indemnified party will, if a claim in respect thereof is to be made against any indemnifying party under this Section 2.9, deliver to the indemnifying party a written notice of the commencement thereof (a "**Claim Notice**") and the indemnifying party shall have the right to participate in, and, to the extent the indemnifying party so desires, jointly with any other indemnifying party similarly noticed, to assume the defense thereof with counsel mutually satisfactory to the parties; provided, however, that an indemnified party shall have the right to retain its own counsel, with the reasonable fees and expenses to be paid by the indemnifying party (i) during the period from the delivery of a Claim Notice until retention of counsel by the indemnifying party; and (ii) if representation of such indemnified party by the counsel retained by the indemnifying party would be inappropriate due to conflict of interests between such indemnified party and any other party represented by such counsel in such proceeding. The failure to deliver written notice to the indemnifying party within a reasonable time of the commencement of any such action shall relieve such indemnifying party of liability to the indemnified party under this Section 2.9 to the extent the indemnifying party is prejudiced as a result thereof, but the omission so to deliver written notice to the indemnifying party will not relieve it of any liability that it may have to any indemnified party otherwise than under this Section 2.9.

(d) Defect Eliminated in Final Prospectus. The foregoing indemnity agreements of the Company and the Investors are subject to the condition that, insofar as they relate to any untrue statement, alleged untrue statement, omission or alleged omission made in a preliminary prospectus or free writing prospectus on file with the Commission at the time the registration statement becomes effective, such indemnity agreement shall not inure to the benefit of any Person if an amended prospectus is filed with the Commission and delivered pursuant to the Securities Act at or prior to the time of sale (including, without limitation, a contract of sale, and as further contemplated by Rule 159 promulgated under the Securities Act) to the Person asserting the loss, liability, claim or damage.

(e) Contribution. In order to provide for just and equitable contribution to joint liability under the Securities Act in any case in which either (i) an Investor exercising rights under this Agreement, or any controlling Person of any Investor, makes a claim for indemnification pursuant to this Section 2.9 but it is judicially determined (by the entry of a final judgment or decree by a court of competent jurisdiction and the expiration of time to appeal or the denial of the last right of appeal) that such indemnification may not be enforced in such case notwithstanding the fact that this Section 2.9 provides for indemnification in such case, or (ii) contribution under the Securities Act may be required on the part of any Investor or any such controlling Person in circumstances for which indemnification is provided under this Section 2.9; then, and in each such case, the Company and the Investors will contribute to the aggregate losses, claims, damages or liabilities to which they may be subject (after contribution from others) in such proportion so that each Investor is responsible for the portion represented by the percentage that the public offering price of its Registrable Securities offered by and sold under the registration statement bears to the public offering price of all securities offered by and sold under such registration statement, and the Company and any other selling Shareholders are responsible for the remaining portion; provided, however, that, in any such case: (A) no Investor will be required to contribute any amount in excess of the net proceeds received by such Investor from the public offering price of all such Registrable Securities offered and sold by such Investor pursuant to such registration statement; and (B) no Person guilty of fraudulent misrepresentation (within the meaning of Section 11(f) of the Securities Act) will be entitled to contribution from any Person who was not guilty of such fraudulent misrepresentation.

(f) Survival. The obligations of the Company and the Investors under this Section 2.9 shall survive until the fifth (5th) anniversary of the completion of any offering of Registrable Securities pursuant to a registration statement, regardless of the expiration of any statutes of limitation or extensions of such statutes.

Section 2.10 Rule 144 Reporting.

With a view to making available to the Investors the benefits of certain rules and regulations of the Commission which may permit the sale of the Restricted Securities to the public without registration, the Company agrees to use its commercially reasonable efforts to:

(a) Make and keep public information available, as those terms are understood and defined in Rule 144 or any similar or analogous rule promulgated under the Securities Act, at all times after the effective date of the first registration filed by the Company for an offering of its securities to the general public;

(b) File with the Commission, in a timely manner, all reports and other documents required of the Company under the Securities Act or the Exchange Act, at all times after the effective date of the first registration under the Securities Act filed by the Company; and

(c) So long as an Investor owns any Restricted Securities, furnish to such Investor forthwith upon request, (i) a written statement by the Company as to its compliance with the reporting requirements of said Rule 144, and of the Exchange Act (at any time after it has become subject to such reporting requirements), (ii) a copy of the most recent annual, interim, quarterly or other report of the Company, and (iii) such other reports and documents as such Investor may reasonably request in availing itself of any rule or regulation of the Commission allowing it to sell any such securities without registration.

ARTICLE III
GENERAL PROVISIONS

Section 3.1 Confidentiality. Each party hereto hereby agrees that it will, and will cause its respective Affiliates and its and their respective representatives to, hold in strict confidence any non-public records, books, contracts, instruments, computer data and other data and information concerning the other parties hereto, whether in written, verbal, graphic, electronic or any other form provided by any party hereto (except to the extent that such information has been (a) previously known by such party on a non-confidential basis from a source other than the other parties hereto or its representatives, provided that, to such party's knowledge, such source is not prohibited from disclosing such information to such party or its representatives by a contractual, legal or fiduciary obligation to the other parties hereto or its representatives, (b) in the public domain through no breach of this Agreement by such party, (c) independently developed by such party or on its behalf, or (d) later lawfully acquired from other sources) (the "**Confidential Information**"). In the event that a party hereto is requested or required by law, governmental authority, rules of stock exchanges, or other applicable judicial or governmental order to disclose any Confidential Information concerning any of the other parties hereto, such party shall, to the extent legally permissible, notify the other party prior to making any such disclosure by providing the other party with the text of the disclosure requirement and draft disclosure at least 24 hours prior to making any such disclosure, and, if requested by another party, assist such other party to limit or minimize such disclosure.

Section 3.2 Termination. Unless expressly provided otherwise herein, in addition to the other termination provisions in this Agreement, this Agreement shall terminate, and have no further force and effect, upon the earliest of: (a) a written agreement to that effect, signed by all parties hereto, and (b) the date following the Closing on which the Investors no longer hold any shares of the Common Stock of the Company; provided that, notwithstanding the foregoing, Article II shall survive any termination of this Agreement until the specific provisions thereof terminate in accordance with their express terms.

Section 3.3 Notices. All notices, requests and other communications to any party hereunder shall be in writing (including facsimile transmission and electronic mail transmission ("**Email**"), so long as a receipt of such Email is requested and received) and shall be given:

If to the Company:

Athenex, Inc.
Conventus Building
1001 Main Street, Suite 600
Buffalo, NY 14203 Attn: Teresa Bair, Vice President, Legal Affairs & Corporate Development
Email: tbair@athenex.com
Facsimile: 716-800-6818

with a copy to:

Harter Secrest & Emery LLP
1600 Bausch & Lomb Place
Rochester, New York 14604
Attn: Alexander R. McClean
Facsimile: 585-232-6500
E-mail: amcclean@hselaw.com

If to any Investor, to its address set forth on Schedule 3.3.

A party may change or supplement the addresses given above, or designate additional addresses, for the purposes of this Section 3.3 by giving the other parties written notice of the new address in the manner set forth above.

Section 3.4 Entire Agreement. This Agreement and the other Transaction Documents, together with all the schedules and exhibits hereto and thereto and the certificates and other written instruments delivered in connection therewith from time to time on and following the date hereof, constitute and contain the entire agreement and understanding of the parties with respect to the subject matter hereof and thereof, and supersedes any and all prior negotiations, correspondence, agreements, understandings, duties or obligations between the parties respecting the subject matter hereof and thereof. Each party expressly represents and warrants that it is not relying on any oral or written representations, warranties, covenants or agreements outside of this Agreement and the other Transaction Documents.

Section 3.5 Governing Law. This Agreement shall be governed by and construed in accordance with the law of the State of New York, without regard to conflict of law principles.

Section 3.6 Dispute Resolution. Each of the parties hereto irrevocably submits to the exclusive jurisdiction of the courts of the State of New York located in New York County and the United States District Court for the Southern District of New York for the purpose of any suit, action, proceeding or judgment relating to or arising out of this Agreement and the transactions contemplated hereby. Service of process in connection with any such suit, action or proceeding may be served on each party hereto anywhere in the world by the same methods as are specified for the giving of notices under this Agreement. Each of the parties hereto irrevocably consents to the jurisdiction of any such court in any such suit, action or proceeding and to the laying of venue in such court. Each party hereto irrevocably waives any

objection to the laying of venue of any such suit, action or proceeding brought in such courts and irrevocably waives any claim that any such suit, action or proceeding brought in any such court has been brought in an inconvenient forum. To the extent that the Company has or hereafter may acquire any immunity (on the grounds of sovereignty or otherwise) from the jurisdiction of any court or from any legal process with respect to itself or its property, the Company irrevocably waives, to the fullest extent permitted by law, such immunity in respect of any such suit, action or proceeding. EACH OF THE PARTIES HERETO HEREBY IRREVOCABLY WAIVES ANY AND ALL RIGHT TO TRIAL BY JURY IN ANY LEGAL PROCEEDING ARISING OUT OF OR RELATED TO THIS AGREEMENT OR THE TRANSACTIONS CONTEMPLATED HEREBY.

Section 3.7 Severability. If any provision of this Agreement is found to be invalid or unenforceable, then such provision shall be construed, to the extent feasible, so as to render the provision enforceable and to provide for the consummation of the transactions contemplated hereby on substantially the same terms as originally set forth herein, and if no feasible interpretation would save such provision, it shall be severed from the remainder of this Agreement, which shall remain in full force and effect unless the severed provision is essential to the rights or benefits intended by the parties. In such event, the parties shall use commercially reasonable efforts to negotiate, in good faith, a substitute, valid and enforceable provision or agreement, which most nearly effects the parties' intent in entering into this Agreement.

Section 3.8 Assignments and Transfers; No Third Party Beneficiaries. Except as otherwise provided herein, this Agreement and the rights and obligations of the Company and the Investors hereunder shall inure to the benefit of, and be binding upon, their respective successors and permitted assigns and legal representatives, but shall not otherwise be for the benefit of any third party. Notwithstanding anything to the contrary, without the prior written consent of the Company, no Investor may assign any of its rights under this Agreement except to an Affiliate of such Investor (a "**Permitted Transferee**"), provided, however, that no Permitted Transferee or any other person may be assigned any of the foregoing rights unless the Company is given written notice by the assigning party stating the name and address of the assignee and identifying the securities of the Company as to which the rights in question are being assigned; and any such transferee shall execute and deliver to the Company and such Investor a Deed of Adherence (in the same form and substance as set out in Exhibit B hereto), subject to the terms and conditions hereof.

Section 3.9 Construction. Each of the parties has participated in the drafting and negotiation of this Agreement. If an ambiguity or question of intent or interpretation arises, this Agreement must be construed as if it is drafted by all the parties and no presumption or burden of proof shall arise favoring or disfavoring any party by virtue of authorship of any of the provisions of this Agreement.

Section 3.10 Counterparts. This Agreement may be executed in two or more identical counterparts, all of which shall be considered one and the same agreement and shall become effective when counterparts have been signed by each party and delivered to the other parties. A facsimile or "PDF" signature shall be considered due execution and shall be binding upon the signatory thereto with the same force and effect as if the signature were an original.

Section 3.11 Aggregation of Shares. All Securities held or acquired by an Investor and/or its Permitted Transferees shall be aggregated together for the purpose of determining the availability of any rights of such Investor under this Agreement.

Section 3.12 Specific Performance. The parties hereto acknowledge and agree irreparable harm may occur for which money damages would not be an adequate remedy in the event that any of the provisions of this Agreement were not performed in accordance with their specific terms or were otherwise breached. It is accordingly agreed that, in addition to any other remedies at law or in equity, the parties to this Agreement shall be entitled to injunction to prevent breaches of this Agreement and to enforce specifically the terms and provisions of this Agreement without posting any bond or other undertaking.

Section 3.13 Amendment; Waiver. This Agreement may be amended, modified or supplemented only by a written instrument duly executed by all the parties hereto. The observance of any provision in this Agreement may be waived (either generally or in a particular instance and either retroactively or prospectively) only by the written consent of the party against whom such waiver is to be effective. Any amendment or waiver effected in accordance with this Section 3.13 shall be binding upon the parties hereof and their respective assigns. It is agreed that no delay or omission to exercise any right, power or remedy accruing to any party, upon any breach, default or noncompliance by another party under this Agreement, shall impair any such right, power or remedy, nor shall it be construed to be a waiver of any such breach, default or noncompliance, or any acquiescence therein, or of or in any similar breach, default or noncompliance thereafter occurring.

Section 3.14 Public Announcements. Without limiting any other provision of this Agreement, the parties hereto, to the extent permitted by applicable law, will consult with each other before issuance, and provide each other the opportunity to review, comment upon and agree on any press release or public statement with respect to this Agreement, the other Transaction Documents and the transactions contemplated hereby and thereby and the ongoing business relationship among the parties. The parties hereto will not issue any such press release or make any such public statement without the prior written consent of the other party, except as may be required by law or any listing agreement with or requirement of the Nasdaq or any other applicable securities exchange, provided that the disclosing party shall, to the extent permitted by applicable law or any listing agreement with or requirement of the Nasdaq or any other applicable securities exchange, and if reasonably practicable, inform the other parties about the disclosure to be made pursuant to such requirements prior to the disclosure.

[*Signature Pages Follow*]

IN WITNESS WHEREOF, the parties have caused their respective duly authorized representatives to execute this Agreement as of the date and year first above written.

ATHENEX, INC.

By: /s/ Johnson Y.N. Lau
Name: Johnson Y.N. Lau
Title: Chief Executive Officer and
Board Chairman

[signature page to Registration Rights Agreement]

IN WITNESS WHEREOF, the parties have caused their respective duly authorized representatives to execute this Agreement as of the date and year first above written.

PERCEPTIVE LIFE SCIENCES MASTER FUND, LTD.

By: /s/ James H. Mannix
Name: James H. Mannix
Title: Chief Operating Officer

VENBIO SELECT FUND LLC

By: /s/ Scott Epstein
Name: Scott Epstein
Title: Chief Financial Officer and Chief Compliance Officer

ORBIMED PARTNERS MASTER FUND LIMITED
By: OrbiMed Capital LLC, solely in its capacity as Investment Advisor

By: /s/ Geoffrey C. Hsu
Name: Geoffrey C. Hsu
Title: Member

THE BIOTECH GROWTH TRUST PLC
By: OrbiMed Capital LLC, solely in its capacity as Portfolio Manager

By: /s/ Geoffrey C. Hsu
Name: Geoffrey C. Hsu
Title: Member

[signature page to Registration Rights Agreement]

SCHEDULE 3.3

ADDRESSES FOR NOTICES TO INVESTORS

(a) Notices to Perceptive Life Sciences Master Funds, Ltd.:

Perceptive Life Sciences Master Funds, Ltd.
51 Astor Place, 10th Floor
New York, NY 10003 Attn: Adam Stone
E-mail: Adam@perspectivelife.com

with a copy (which shall not constitute notice) to:

Tannenbaum Helpern Syracuse Hirschtritt LLP
900 Third Avenue
New York, NY 10022
Attn: David R. Lallouz
Facsimile: 646-390-7005
Email: lallouz@thsh.com

(b) Notices to venBio Select Fund LLC:

venBio Select Fund LLC
110 Greene Street
Suite 800
New York, NY 10012
Attn: Scott Epstein, CFO and CCO
E-mail: sepstein@venbioselect.com

(c) Notices to OrbiMed Partners Master Fund Limited or The Biotech Growth Trust PLC:

c/o OrbiMed Capital LLC
601 Lexington Avenue, 54th Floor
New York, NY 10022
Attn: Geoffrey C. Hsu
E-mail:HsuG@OrbiMed.com

with a copy (which shall not constitute notice) to:

c/o OrbiMed Capital LLC
601 Lexington Avenue, 54th Floor
New York, NY 10022
Attn: General Counsel
Email: legal@OrbiMed.com

Exhibit A

Plan of Distribution

The selling stockholders, which as used herein includes donees, pledgees, transferees or other successors-in-interest selling shares of common stock or interests in shares of common stock received after the date of this prospectus from a selling stockholder as a gift, pledge, partnership distribution or other transfer, may, from time to time, sell, transfer or otherwise dispose of any or all of their shares of common stock or interests in shares of common stock on any stock exchange, market or trading facility on which the shares are traded or in private transactions. These dispositions may be at fixed prices, at prevailing market prices at the time of sale, at prices related to the prevailing market price, at varying prices determined at the time of sale, or at negotiated prices.

The selling stockholders may use any one or more of the following methods when disposing of shares or interests therein:

- 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;
- short sales effected after the date the registration statement of which this Prospectus is a part is declared effective by the SEC;
- through the writing or settlement of options or other hedging transactions, whether through an options exchange or otherwise;
- broker-dealers may agree with the selling stockholders to sell a specified number of such shares at a stipulated price per share;
- a combination of any such methods of sale; and
- any other method permitted by applicable law.

The selling stockholders may, from time to time, pledge or grant a security interest in some or all of the shares of common 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, under this prospectus, or under an amendment to this prospectus under Rule 424(b)(3) or other applicable provision of the Securities Act amending 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 the shares of common stock in other circumstances, in which case the transferees, pledgees or other successors in interest will be the selling beneficial owners for purposes of this prospectus.

In connection with the sale of our common stock or interests therein, 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 common stock in the course of hedging the positions they assume. The selling stockholders may also sell shares of our common stock short and deliver these securities to close out their short positions, or loan or pledge the common stock to broker-dealers that in turn may sell these securities. 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).

The aggregate proceeds to the selling stockholders from the sale of the common stock offered by them will be the purchase price of the common stock less discounts or commissions, if any. Each of the selling stockholders reserves the right to accept and, together with their agents from time to time, to reject, in whole or in part, any proposed purchase of common stock to be made directly or through agents. We will not receive any of the proceeds from this offering. Upon any exercise of the warrants by payment of cash, however, we will receive the exercise price of the warrants.

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, provided that they meet the criteria and conform to the requirements of that rule.

The selling stockholders and any underwriters, broker-dealers or agents that participate in the sale of the common stock or interests therein may be “underwriters” within the meaning of Section 2(11) of the Securities Act. Any discounts, commissions, concessions or profit they earn on any resale of the shares may be underwriting discounts and commissions 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 prospectus delivery requirements of the Securities Act.

To the extent required, the shares of our common stock to be sold, the names of the selling stockholders, the respective purchase prices and public offering prices, the names of any agents, dealer or underwriter, any applicable commissions or discounts with respect to a particular offer will be set forth in an accompanying prospectus supplement or, if appropriate, a post-effective amendment to the registration statement that includes this prospectus.

In order to comply with the securities laws of some states, if applicable, the common stock may be sold in these jurisdictions only through registered or licensed brokers or dealers. In

addition, in some states the common stock may not be sold unless it has been registered or qualified for sale or an exemption from registration or qualification requirements is available and is complied with.

We have advised the selling stockholders that the anti-manipulation rules of Regulation M under the Exchange Act may apply to sales of shares in the market and to the activities of the selling stockholders and their affiliates. In addition, to the extent applicable we will make copies of this prospectus (as it may be supplemented or amended from time to time) available to the selling stockholders for the purpose of satisfying the prospectus delivery requirements of the Securities Act. The selling stockholders may indemnify any broker-dealer that participates in transactions involving the sale of the shares against certain liabilities, including liabilities arising under the Securities Act.

We have agreed to indemnify the selling stockholders against liabilities, including liabilities under the Securities Act and state securities laws, relating to the registration of the shares offered by this prospectus.

We have agreed with the selling stockholders to keep the registration statement of which this prospectus constitutes a part effective until the earlier of (1) such time as all of the shares covered by this prospectus have been disposed of pursuant to and in accordance with the registration statement or (2) the date on which all of the shares may be sold without restriction pursuant to Rule 144 of the Securities Act.

EXHIBIT B
FORM OF DEED OF ADHERENCE

THIS DEED is made the day of 20[ ] by [ ] of [ ] (the "**Permitted Transferee**") and is supplemental to the Registration Rights Agreement dated [•], 2019 made among Athenex, Inc. (the "**Company**"), and certain Investors (such agreement as amended, restated or supplemented from time to time, the "**Registration Rights Agreement**").

WITNESSETH as follows:

The Permitted Transferee confirms that it has been provided with a copy of the Registration Rights Agreement and all amendments, restatements and supplements thereto and hereby covenants with each of the parties to the Registration Rights Agreement from time to time to observe, perform and be bound by all the terms and conditions of the Registration Rights Agreement which are capable of applying to the Permitted Transferee to the intent and effect that the Permitted Transferee shall be deemed as and with effect from the date hereof to be a party to the Registration Rights Agreement and to be subject to the obligations thereof.

The address and facsimile number at which notices are to be served on the Permitted Transferee under the Registration Rights Agreement and the person for whose attention notices are to be addressed are as follows:

[*to insert contact details*]

Words and expressions defined in the Registration Rights Agreement shall have the same meaning in this Deed. This Deed shall be governed by and construed in accordance with the laws of the State of New York.

This Deed shall take effect as a deed poll for the benefit of the Company, the Investors (as defined in the Registration Rights Agreement), and any other parties to the Registration Rights Agreement.

IN WITNESS whereof the Permitted Transferee has executed this Deed the day and year first above written.

THE COMMON SEAL of [ ].

was hereunto affixed)

in the presence of:)

_____
(Director)

_____
(Director/Secretary)

Exhibit 5.1

July 23, 2019

Athenex, Inc.
1001 Main Street, Suite 600
Buffalo, New York 14203

Re: Registration Statement on Form S-3

Ladies and Gentlemen:

We have acted as counsel to Athenex, Inc., a Delaware corporation (the "***Company***"), in connection with its filing of a Registration Statement on Form S-3 (the "***Registration Statement***") with the Securities and Exchange Commission pursuant to the Securities Act of 1933, as amended (the "***Securities Act***") registering the resale by selling stockholders of up to 10,000,000 shares (the "***Resale Shares***") of the Company's common stock, par value $0.001 per share ("***Common Stock***").

In connection with the foregoing, we have examined originals or copies of such corporate records of the Company, certificates and other communications of public officials, certificates of officers of the Company and such other documents as we have deemed relevant or necessary for the purpose of rendering the opinions expressed herein. As to questions of fact material to those opinions, we have, to the extent we deemed appropriate, relied on certificates of officers of the Company and on certificates and other communications of public officials. We have assumed the genuineness of all signatures on, and the authenticity of, all documents submitted to us as originals, the conformity to authentic original documents of all documents submitted to us as copies thereof, the due authorization, execution and delivery by the parties thereto other than the Company of all documents examined by us, and the legal capacity of each individual who signed any of those documents.

Based upon the foregoing, and subject to the additional qualifications set forth below, we are of the opinion that the Resale Shares were validly issued, fully paid and are non-assessable.

The opinions expressed herein are limited exclusively to the applicable provisions of the Delaware General Corporation Law as currently in effect, and we are expressing no opinion as to the effect of the laws of any other jurisdiction.

This opinion letter has been prepared in accordance with the customary practice of lawyers who regularly give, and lawyers who regularly advise opinion recipients concerning, opinions of the type contained herein.

This opinion letter deals only with the specified legal issues expressly addressed herein, and you should not infer any opinion that is not explicitly addressed herein from any matter stated in this letter.

We consent to the use of this opinion as an exhibit to the Registration Statement and the reference to this firm under the caption "Legal Matters" in the prospectus. In giving such consent, we do not hereby admit that we are within the category of persons whose consent is required under Section 7 of the Securities Act and the rules and regulations thereunder. This opinion is rendered to you as of the date hereof and we assume no obligation to advise you or any other person hereafter with regard to any change after the date hereof in the circumstances or the law that may bear on the matters set forth herein even though the changes may affect the legal analysis or legal conclusion or other matters in this letter.

Very truly yours,

/s/ Harter Secrest & Emery LLP

Exhibit 23.1

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We consent to the incorporation by reference in this Registration Statement on Form S-3 of our report dated March 11, 2019 relating to the consolidated financial statements and consolidated financial statement schedule of Athenex, Inc. and subsidiaries (the "Company") (which report expresses an unqualified opinion and includes an explanatory paragraph regarding a going concern uncertainty) appearing in the Annual Report on Form 10-K of Athenex, Inc. and subsidiaries for the year ended December 31, 2018, and to the reference to us under the heading "Experts" in the Prospectus, which is part of this Registration Statement.

/s/ Deloitte & Touche LLP

Williamsville, New York
July 23, 2019