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Registration No. 333-228748

PROSPECTUS

3,796,668 Shares



Common Stock

This prospectus relates to the offer and sale of up to 3,796,668 shares of our common stock under this prospectus by the selling stockholders identified in the "Selling Stockholders" section of this prospectus or their transferees, pledges, donees or successors in interest. The shares of common stock registered hereunder are issuable to the selling stockholders at their election upon conversion of certain amended and restated senior secured convertible promissory notes, or Notes, issued pursuant to our facility agreement dated as of May 11, 2016, by and among us, the selling stockholders and other parties thereto, as amended by the First Amendment, dated June 1, 2017, and by the Second Amendment to the Facility Agreement, or the Second Amendment, dated November 5, 2018, which we refer to as the Facility Agreement.

The selling stockholders or their pledges, donees, transferees or other successors in interest may sell the shares of common stock described in this prospectus in a number of different ways and at varying prices. We provide more information about how the selling stockholders may sell shares of common stock in the section titled "Plan of Distribution" on page 13. We are not selling any securities under this prospectus and will not receive any of the proceeds from the sale of these shares by the selling stockholders. We will pay certain expenses incurred in registering the shares, including legal and accounting fees.

Our common stock is listed on the Nasdaq Global Market under the symbol "NEOS." On December 19, 2018, the closing price for our common stock, as reported on the Nasdaq Global Market, was \$1.88 per share. Our principal executive offices are located at 2940 N. Hwy 360, Grand Prairie, TX 75050.

Investing in our securities involves a high degree of risk. You should review carefully the risks and uncertainties referenced under the heading "Risk Factors" contained in this prospectus beginning on page 7 and any applicable prospectus supplement, and under similar headings in the other documents that are incorporated by reference into this prospectus.

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

The date of this Prospectus is December 20, 2018.

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INFORMATION CONTAINED IN THIS PROSPECTUS

We have not authorized any dealer, agent or other person to give any information or to make any representation other than those contained or incorporated by reference in this prospectus and, if applicable, any accompanying prospectus supplement. You must not rely upon any information or representation not contained or incorporated by reference in this prospectus or, if applicable, any accompanying prospectus supplement. This prospectus and, if applicable, any accompanying prospectus supplement, do not constitute an offer to sell or the solicitation of an offer to buy any securities other than the registered securities to which they relate, nor do this prospectus and, if applicable, any accompanying prospectus supplement constitute an offer to sell or the solicitation of an offer to buy securities in any jurisdiction to any person to whom it is unlawful to make such offer or solicitation in such jurisdiction. You should not assume that the information contained in this prospectus and, if applicable, any accompanying prospectus supplement, is accurate on any date subsequent to the date set forth on the front of the document or that any information we have incorporated by reference is correct on any date subsequent to the date of the document incorporated by reference, even though this prospectus and, if applicable, any accompanying prospectus supplement, is delivered or securities are sold on a later date.

SUMMARY

The following summary provides an overview of selected information related to this offering and does not contain all the information that you should consider before investing in our securities. You should carefully read this entire prospectus, including the risks of investing discussed under "Risk Factors" beginning on page 7, the financial statements and related notes and other information incorporated by reference in this prospectus, and, if applicable, any prospectus supplement or related free writing prospectus, and the additional information described under the captions "Where You Can Find More Information" and "Incorporation by Reference," before buying securities in this offering. Unless the context otherwise requires, "NEOS," the "Company," "we," "us," "our" and similar names refer to Neos Therapeutics, Inc. References to "selling stockholders" refer to the stockholders listed herein under the heading "Selling Stockholders" on page 11, who may sell shares from time to time as described in this prospectus.

About This Prospectus

The securities described in this prospectus are part of a registration statement that we filed with the Securities and Exchange Commission, or the SEC, using a "shelf" registration process to register 3,796,668 shares of our common stock, or the Shares. The Shares are issuable to the selling stockholders at the election of each selling stockholder to convert the Notes issued to the selling stockholders pursuant to the Facility Agreement, and as described in the Current Report on Form 8-K filed by us with the SEC on November 5, 2018. The Shares are being registered for resale or other disposition by the selling stockholders or their pledges, donees, transferees or other successors in interest. We will not receive any proceeds from the sale or other disposition of the Shares registered hereunder, or interests therein.

About the Company

We are a pharmaceutical company focused on developing, manufacturing and commercializing products utilizing our proprietary modified-release drug delivery technology platform, which we have already used to develop Adzenys XR-ODT, Cotempla XR-ODT and Adzenys ER oral suspension, or Adzenys ER, for the treatment of attention deficit hyperactivity disorder, or ADHD. Our products and product candidates are modified release medications in patient-friendly, orally disintegrating tablets, or ODT, or oral suspension dosage forms. Our proprietary modified-release drug delivery platform has enabled us to create novel, extended-release ODT and oral suspension dosage forms. We received approval from the U.S. Food and Drug Administration, or FDA, for Adzenys XR-ODT, our amphetamine XR-ODT, on January 27, 2016 and launched the commercialization of this product on May 16, 2016. We received approval from the FDA for Cotempla XR-ODT, our methylphenidate XR-ODT for the treatment of ADHD in patients 6 to 17 years old, on June 19, 2017. We initiated an early experience program with limited product availability on September 5, 2017 before launching this product nationwide on October 2, 2017. Also, we received approval from the FDA for Adzenys ER, our amphetamine extended-release oral suspension, on September 15, 2017, and launched the commercialization of this product on February 26, 2018. We believe Adzenys XR-ODT and Cotempla XR-ODT are the first amphetamine XR-ODT and the first methylphenidate XR-ODT, respectively, for the treatment of ADHD on the market. In addition to our marketed products, we are developing NT-0400, our XR-ODT product candidate, for nausea and vomiting and NT0501, our product candidate for the treatment of sialorrhea.

Our predecessor company was incorporated in Texas on November 30, 1994 as PharmaFab, Inc. and subsequently changed its name to Neostx, Inc. On June 15, 2009, we completed a reorganization pursuant to which substantially all of the capital stock of Neostx, Inc. was acquired by a newly formed Delaware corporation, named Neos Therapeutics, Inc. The remaining capital stock of Neostx, Inc. was acquired by us on June 29, 2015, and Neostx, Inc. was merged with and into Neos Therapeutics, Inc. Our principal executive offices are located at 2940 N. Hwy 360, Grand Prairie, TX 75050 and our

telephone number is (972) 408-1300. Our website address is www.neostx.com. The information contained on our website is not a part of, and should not be construed as being incorporated by reference into, this prospectus or any applicable prospectus supplement. Our common stock trades on the Nasdaq Global Market under the symbol "NEOS".

Implications of Being an Emerging Growth Company

We qualify as an "emerging growth company" as defined in the Jumpstart Our Business Startups Act of 2012, or the JOBS Act. As an emerging growth company, we may take advantage of specified reduced disclosure and other requirements that are otherwise applicable generally to public companies. These provisions include, among others:

- only two years of audited financial statements, in addition to any required unaudited interim financial statements with correspondingly reduced "Management's Discussion and Analysis of Financial Condition and Results of Operations" disclosure;
- reduced disclosure about our executive compensation arrangements;
- no non-binding advisory votes on executive compensation or golden parachute arrangements; and
- exemption from the auditor attestation requirement in the assessment of our internal controls over financial reporting.

We may take advantage of these exemptions until such time that we are no longer an emerging growth company. We will continue to remain an "emerging growth company" until the earliest of the following: (i) the last day of the fiscal year following the fifth anniversary of our initial public offering; (ii) the last day of the fiscal year in which our total annual gross revenue is equal to or more than \$1.07 billion (as inflation-adjusted by the SEC from time to time); (iii) the date on which we have issued more than \$1 billion in nonconvertible debt during the previous three years; or (iv) the date on which we are deemed to be a large accelerated filer under the rules of the Securities and Exchange Commission, or the SEC. We may choose to take advantage of some, but not all, of the available exemptions. We have taken advantage of certain reduced reporting burdens in this prospectus and any applicable prospectus supplement and in documents incorporated herein and therein by reference. Accordingly, the information contained herein may be different than the information you receive from other public companies in which you hold stock.

RISK FACTORS

Investing in our securities involves a high degree of risk. You should carefully consider the risks described in this prospectus, together with all of the other information incorporated by reference into this prospectus, including from our most recent annual report on Form 10-K and subsequent quarterly reports on Form 10-Q, as well as other information we include or incorporate by reference into this prospectus and any applicable prospectus supplement, before making an investment decision. Our business, financial condition or results of operations could be materially adversely affected by the materialization of any of these risks. The trading price of our securities could decline due to the materialization of any of these risks, and you may lose all or part of your investment.

CAUTIONARY STATEMENT REGARDING FORWARD-LOOKING STATEMENTS

This prospectus, including the documents that we incorporate by reference, contains forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, or the Securities Act, and Section 21E of the Securities Exchange Act of 1934, as amended, or the Exchange Act. Any statements about our expectations, beliefs, plans, objectives, assumptions or future events or performance are not historical facts and may be forward-looking. These statements are often, but are not always, made through the use of words or phrases such as "may," "will," "could," "should," "expects," "intends," "plans," "anticipates," "believes," "estimates," "predicts," "projects," "potential," "continue," and similar expressions, or the negative of these terms, or similar expressions. Accordingly, these statements involve estimates, assumptions, risks and uncertainties which could cause actual results to differ materially from those expressed in them. Any forward-looking statements are qualified in their entirety by reference to the factors discussed throughout this prospectus, and in particular those factors referenced in the section "Risk Factors."

This prospectus contains forward-looking statements that are based on our management's belief and assumptions and on information currently available to our management. These statements relate to future events or our future financial performance, and involve known and unknown risks, uncertainties and other factors that may cause our actual results, levels of activity, performance or achievements to be materially different from any future results, levels of activity, performance or achievements expressed or implied by these forward-looking statements. Forward-looking statements include, but are not limited to, statements about:

- our anticipated cash needs and our estimates regarding our anticipated expenses, capital requirements and our needs for future financing;
- our ability to commercialize Adzenys XR-ODT, Cotempla XR-ODT and Adzenys ER oral suspension, or Adzenys ER, or develop and commercialize any other future product or product candidate;
- our ability to maintain our license for NT0501, to obtain regulatory approval of NT0501 and to otherwise realize the intended benefits of this license;
- the effect of the amendment to our facility agreement and our ability to satisfy the repayment obligations thereunder;
- the cost or other aspects of the future sales of Adzenys XR-ODT, Cotempla XR-ODT and Adzenys ER or the timing, cost or other aspects of the commercial launch and future sales of any other future product or product candidate;
- our ability to increase our manufacturing and distribution capabilities for Adzenys XR-ODT, Cotempla XR-ODT and Adzenys ER or any other future product or product candidate;
- the attention deficit hyperactivity disorder patient market size and market adoption of Adzenys XR-ODT, Cotempla XR-ODT and Adzenys ER by physicians and patients;
- the therapeutic benefits, effectiveness and safety of Adzenys XR-ODT, Cotempla XR-ODT and Adzenys ER or any other future product or product candidate;
- our expectations regarding the commercial supply of Adzenys XR-ODT, Cotempla XR-ODT and Adzenys ER, or any other future products, or our generic Tussionex;
- our ability to receive, and the timing of any receipt of the U.S. Food and Drug Administration, or FDA, approvals, or other regulatory action in the United States and elsewhere, for any future product candidate;
- our expectations regarding federal, state and foreign regulatory requirements;

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- our entry into the settlement and licensing agreement with Actavis Laboratories FL, Inc., or Actavis, the effect of our agreement with Actavis on its Abbreviated New Drug Application, or ANDA, and with the FDA for a generic version of Adzenys XR-ODT, and the expected timing of the manufacture and marketing of Actavis's generic version of Adzenys XR-ODT under the ANDA;
- our product research and development activities, including the timing and progress of our clinical trials, and projected expenditures;
- issuance of patents to us by the U.S. Patent and Trademark Office and other governmental patent agencies;
- our ability to achieve profitability;
- our staffing needs; and
- the additional risks, uncertainties and other factors described under the caption "Risk Factors" in this prospectus and any prospectus supplement that we may file.

These forward-looking statements are neither promises nor guarantees of future performance due to a variety of risks and uncertainties and other factors more fully discussed in the "Risk Factors" section in this prospectus, the section of any accompanying prospectus supplement entitled "Risk Factors" and the risk factors and cautionary statements described in other documents that we file from time to time with the SEC, specifically under "Item 1A. Risk Factors" and elsewhere in our most recent Annual Report on Form 10-K for the period ended December 31, 2017 and our most recent Quarterly Report on Form 10-Q for the quarter ended September 30, 2018, and our Current Reports on Form 8-K.

Given these uncertainties, readers should not place undue reliance on our forward-looking statements. These forward-looking statements speak only as of the date on which the statements were made and are not guarantees of future performance. Except as may be required by applicable law, we do not undertake to update any forward-looking statements after the date of this prospectus or the respective dates of documents incorporated by reference herein or therein that include forward-looking statements.

USE OF PROCEEDS

The proceeds from the sale of the Shares offered pursuant to this prospectus are solely for the accounts of the selling stockholders. Accordingly, we will not receive any of the proceeds from the sale of the Shares offered by this prospectus. See "Selling Stockholders" and "Plan of Distribution" described below.

SELLING STOCKHOLDERS

The shares of common stock covered by this prospectus may be acquired by the selling stockholders from us by electing to convert the Notes issued to the selling stockholders pursuant to the Facility Agreement. Under the registration rights agreement, or the Registration Agreement, dated November 5, 2018, by and among the Company and the selling stockholders, we agreed to file a registration statement with the SEC covering the resale of the shares issuable upon conversion of the Notes referenced above. The principal of the Notes is convertible by the selling stockholders into shares of our common stock at a per share conversion price that equals 95% (subject to adjustment as provided in the Notes) of the greater of: (A) the average of the volume weighted average prices per share of the common stock on the NASDAQ Global Market for the three trading day period immediately preceding such conversion, and (B) \$10.00 (subject to adjustment as provided in the Notes). However, the Notes provide that we are not required to issue more than an aggregate of 3,796,668 shares of common stock pursuant to conversions of the Notes (unless requisite stockholder approval is obtained), which we refer to as the Exchange Cap, and that only 50% of the principal amount of the Notes outstanding as of November 8, 2018 may be converted into shares of our common stock on or before November 5, 2019, which we refer to as the Conversion Cap. Further, under the terms of the Notes, the number of shares of our common stock that may be acquired by a selling stockholder upon any conversion of a Note is limited to the extent necessary to ensure that, following such conversion, such selling stockholder would not, together with its affiliates and any other persons or entities whose beneficial ownership of our common stock would be aggregated with such selling stockholder for purposes of Section 13(d) of the Exchange Act, beneficially own in excess of 4.985% of the total number of shares of our common stock then issued and outstanding, which we refer to as the 4.985% Blocker. For purposes of the 4.985% blocker, beneficial ownership is determined in accordance with Section 13(d) of the Exchange Act and the rules and regulations promulgated thereunder. In addition, beginning on May 11, 2019, subject to the terms, conditions and limitations set forth in the Notes, we will have the right to pay principal and future interest in shares of common stock not to exceed 2,135,625 shares in the aggregate. The numbers of shares in the table below do not reflect any such potential payment in shares, assume the Notes will be convertible into the maximum numbers of shares allowed under the Exchange Cap, and do not take into account the Conversion Cap or the 4.985% Blocker.

The following table provides information regarding the selling stockholders and the number of Shares each selling stockholder is offering under this prospectus. We have prepared this table based on information furnished to us by or on behalf of the selling stockholders. Under the rules of the SEC, beneficial ownership includes shares over which the indicated beneficial owner exercises voting or investment power. Beneficial ownership is determined under Section 13(d) of the Securities Exchange Act of 1934, as amended, or the Exchange Act, and generally includes voting or investment power with respect to securities, including any securities that grant a selling stockholder the right to acquire common stock within 60 days of November 30, 2018. Unless otherwise indicated in the footnotes below, we believe that the selling stockholders have sole voting and investment power with respect to all shares beneficially owned. The percentage ownership data is based on 49,676,303 shares of our common stock issued and outstanding as of November 15, 2018. The number of shares of common stock beneficially owned by the selling stockholders is based on information provided by the selling stockholders as of as of November 30, 2018. Since November 30, 2018, the selling stockholders may have sold, transferred or otherwise disposed of shares of our common stock in transactions exempt from the registration requirements of the Securities Act of 1933, as amended, or the Securities Act.

The Shares may be sold by the selling stockholders, by those persons or entities to whom they transfer, donate, devise, pledge or distribute their Shares or by other successors in interest. The information regarding shares beneficially owned after this offering assumes the sale of all Shares offered by each of the selling stockholders. The selling stockholders may sell less than all of the Shares

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listed in the table. In addition, the Shares listed below may be sold pursuant to this prospectus or in privately negotiated transactions. Accordingly, we cannot estimate the number of Shares the selling stockholders will sell under this prospectus.

Other than our Facility Agreement, the selling stockholders have not held any position or office or had any other material relationship with us or any of our predecessors or affiliates within the past three years, other than beneficial ownership of the shares described in the table below.

Name of Selling Stockholder(1)	Shares Beneficially Owned before Offering(2)	Shares Offered Hereby(2)	Shares Beneficially Owned After Offering(3)	
			Number	Percentage (%)
Deerfield Special Situations Fund, L.P.(4)	1,676,567	1,265,556	411,011	*
Deerfield Private Design Fund III, L.P.(5)	3,350,368	2,531,112	819,256	2.48%

* Represents beneficial ownership of less than 1% of our outstanding common stock.

- (1) The business address of each selling stockholder is: c/o Deerfield Management Company, L.P., 780 Third Avenue, 37th Floor, New York, NY 10017. Additional information concerning named selling stockholders or pledgees, donees, transferees or other successors-in-interest of any such stockholder may be set forth in a prospectus supplement to this prospectus.
- (2) The number of shares of common stock beneficially owned, and the number of shares offered, by each selling stockholder reflects the pro rata portion of the maximum number of Shares issuable the selling stockholders under the Exchange Cap, based on the principal amount of the Note held by such selling stockholder as of November 30, 2018.
- (3) We do not know when or in what amounts a selling stockholder may offer Shares for sale. The selling stockholders may not sell any or all of the Shares offered by this prospectus. Because the selling stockholders may offer all or some of the Shares pursuant to this offering and because there are currently no agreements, arrangements or undertakings with respect to the sale of any of the Shares, we cannot estimate the number of Shares that will be held by the selling stockholders after completion of this offering. However, for purposes of this table, we have assumed that, after completion of this offering, none of the Shares covered by this prospectus will be held by the selling stockholders.
- (4) Includes: (i) 411,011 shares of common stock held by Deerfield Special Situations Fund, L.P., or DSS, and (ii) 1,265,556 shares of common stock issuable upon conversion of the Note held by DSS, based on the lowest potential conversion price and the outstanding principal amount of such Note as of November 30, 2018, and after giving effect to the Exchange Cap. DSS disclaims beneficial ownership of shares of common stock in excess of the DSS Conversion Cap or the 4.985% Blocker. Deerfield Mgmt, L.P. is the general partner of DSS. Deerfield Management Company, L.P. is the investment manager of DSS. Mr. James E. Flynn is the sole member of the general partner of each of Deerfield Mgmt, L.P. and Deerfield Management Company, L.P. Deerfield Mgmt, L.P., Deerfield Management Company, L.P. and Mr. James E. Flynn may be deemed to beneficially own the shares of common stock beneficially owned by DSS.
- (5) Includes: (i) 819,256 shares of common stock held by Deerfield Private Design Fund III, L.P., or DPD III, and (ii) 2,531,112 shares of common stock issuable upon conversion of the Note held by DPD III based on potential conversion price and the outstanding principal amount of such Note as of November 30, 2018, and after giving effect to the Exchange Cap. DPD III disclaims beneficial ownership of shares of common stock in excess of the DPD Conversion Cap or the 4.985% Blocker. Deerfield Mgmt III, L.P. is the general partner of DPD III. Deerfield Management Company, L.P. is the investment manager of Deerfield Private Design Fund III, L.P. Mr. James E. Flynn is the sole member of the general partner of each of Deerfield Mgmt III, L.P. and Deerfield Management Company, L.P. Deerfield Mgmt III, L.P., Deerfield Management Company, L.P. and Mr. James E. Flynn may be deemed to beneficially own the shares of common stock beneficially owned by DPD III.

PLAN OF DISTRIBUTION

The selling stockholders, or their pledgees, donees, transferees, or any of their successors in interest selling Shares received from a named selling stockholder as a gift, pledge, partnership distribution or other transfer after the date of this prospectus (all of whom may be selling stockholders), may sell any or all of its Shares from time to time on any stock exchange, market or trading facility on which the Shares are listed or traded, in the over-the-counter market, in privately negotiated transactions or otherwise, at fixed prices that may be changed, at market prices prevailing at the time of sale, at prices related to prevailing market prices or at prices otherwise negotiated. The selling stockholders may sell the Shares by one or more of the following methods, without limitation:

- (a) block trades in which the broker or dealer so engaged will attempt to sell the securities as agent but may position and resell a portion of the block as principal to facilitate the transaction;
- (b) purchases by a broker or dealer as principal and resale by the broker or dealer for its own account pursuant to this prospectus;
- (c) an exchange distribution in accordance with the rules of any stock exchange on which the securities are listed;
- (d) ordinary brokerage transactions and transactions in which the broker solicits purchases;
- (e) privately negotiated transactions;
- (f) short sales;
- (g) through the writing or settlement of options or other hedging transactions on the securities, whether or not the options are listed on an options exchange;
- (h) through the distribution of the securities by any selling stockholder holder to its partners, members or stockholders;
- (i) one or more underwritten offerings on a firm commitment or best efforts basis;
- (j) any combination of any of these methods of sale; and
- (k) any other method permitted pursuant to applicable law.

The selling stockholders may also transfer the securities by gift. We do not know of any arrangements by the selling stockholders for the sale of any of the securities.

The selling stockholders may engage brokers and dealers, and any brokers or dealers may arrange for other brokers or dealers to participate in effecting sales of the Shares. These brokers, dealers or underwriters may act as principals, or as an agent of a selling stockholder. Broker-dealers may agree with a selling stockholder to sell a specified number of the Shares at a stipulated price per Share. If the broker-dealer is unable to sell the Shares acting as agent for a selling stockholder, it may purchase as principal any unsold Shares at the stipulated price. Broker-dealers who acquire the Shares as principals may thereafter resell the Shares from time to time in transactions in any stock exchange, market or trading facility on which the Shares are then listed or traded, at prices and on terms then prevailing at the time of sale, at prices related to the then-current market price or in negotiated transactions. Broker-dealers may use block transactions and sales to and through broker-dealers, including transactions of the nature described above. The selling stockholders may also sell the Shares in accordance with Rule 144 under the Securities Act, rather than pursuant to this prospectus, regardless of whether the Shares are covered by this prospectus.

From time to time, one or more of the selling stockholders may pledge, hypothecate or grant a security interest in some or all of the Shares owned by them. The pledgees, secured parties or persons

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to whom the Shares have been hypothecated will, upon foreclosure in the event of default, be deemed to be selling stockholders and may offer and sell such Shares, from time to time, under this prospectus, or under an amendment or supplement to this prospectus under Rule 424(b)(3) or other applicable provisions 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 number of a selling stockholder's Shares offered under this prospectus will decrease as and when it takes such actions. The plan of distribution for that selling stockholder's Shares will otherwise remain unchanged. In addition, a selling stockholder may, from time to time, sell the Shares short, and, in those instances, this prospectus may be delivered in connection with the short sales and the Shares offered under this prospectus may be used to cover short sales.

To the extent required under the Securities Act, the aggregate amount of selling stockholders' Shares being offered and the terms of the offering, the names of any agents, brokers, dealers or underwriters and any applicable commission with respect to a particular offer will be set forth in an accompanying prospectus supplement. Any underwriters, dealers, brokers or agents participating in the distribution of the Shares may receive compensation in the form of underwriting discounts, concessions, commissions or fees from a selling stockholder and/or purchasers of selling stockholders' Shares, for whom they may act (which compensation as to a particular broker-dealer might be in excess of customary commissions).

The selling stockholders and any underwriters, brokers, dealers or agents that participate in the distribution of the Shares may be deemed to be "underwriters" within the meaning of the Securities Act, and any discounts, concessions, commissions or fees received by them and any profit on the resale of the Shares sold by them may be deemed to be underwriting discounts and commissions.

A selling stockholder may enter into hedging transactions with broker-dealers and the broker-dealers may engage in short sales of the Shares in the course of hedging the positions they assume with that selling stockholder, including, without limitation, in connection with distributions of the Shares by those broker-dealers. A selling stockholder may enter into option or other transactions with broker-dealers that involve the delivery of the Shares offered hereby to the broker-dealers, who may then resell or otherwise transfer those Shares. A selling stockholder may also loan or pledge the Shares offered hereby to a broker-dealer and the broker-dealer may sell the Shares offered hereby so loaned or upon a default may sell or otherwise transfer the pledged Shares offered hereby.

The selling stockholders and other persons participating in the sale or distribution of the Shares will be subject to applicable provisions of the Exchange Act, and the rules and regulations thereunder, including Regulation M. This regulation may limit the timing of purchases and sales of any of the Shares by the selling stockholders and any other person. Furthermore, Regulation M may restrict the ability of any person engaged in the distribution of the Shares to engage in market-making activities with respect to the particular Shares being distributed for a period of up to five business days before the distribution. These restrictions may affect the marketability of the Shares and the ability of any person or entity to engage in market-making activities with respect to the Shares.

We have agreed to indemnify in certain circumstances the selling stockholders and any brokers, dealers and agents who may be deemed to be underwriters, if any, of the Shares covered by the registration statement, against certain liabilities, including liabilities under the Securities Act. The selling stockholders have agreed to indemnify us in certain circumstances against certain liabilities, including liabilities under the Securities Act.

The Shares offered hereby are issuable to the selling stockholders pursuant to an exemption from the registration requirements of the Securities Act. We agreed to register the Shares under the Securities Act, and to keep the registration statement of which this prospectus forms a part effective until the earlier of the date on which the selling stockholders have publicly sold all of the Shares or the date that all the Shares may be sold by the selling stockholders to the public without volume or

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manner-of-sale restrictions pursuant to Rule 144 promulgated under the Securities Act, and without the requirement for the Company to be in compliance with the current public information requirement under Rule 144. We have agreed to pay all expenses in connection with this offering, including the fees and expenses of counsel to the selling stockholders up to \$25,000 per registration, but not including underwriting discounts, concessions or commissions of the selling stockholders.

We will not receive any proceeds from sales of any Shares by the selling stockholders.

We cannot assure you that the selling stockholders will sell all or any portion of the Shares offered hereby.

DESCRIPTION OF CAPITAL STOCK

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

General

Our authorized capital stock consists of 100,000,000 shares of common stock, \$0.001 par value per share, and 5,000,000 shares of undesignated preferred stock, \$0.001 par value per share.

As of November 15, 2018, there were 49,676,303 shares of our common stock outstanding, held by 63 stockholders of record, and no shares of preferred stock outstanding. Our board of directors is authorized, without stockholder approval except as required by the listing standards of the Nasdaq Global Market, to issue additional shares of our capital stock.

Common Stock

The holders of our common stock are entitled to one vote per share on all matters to be voted on by our stockholders. The amended and restated certificate of incorporation and amended and restated bylaws currently in effect do not provide for cumulative voting rights. Because of this, the holders of a plurality of the shares of common stock entitled to vote in any election of directors can elect all of the directors standing for election, if they should so choose. With respect to matters other than the election of directors, at any meeting of the stockholders at which a quorum is present or represented, the affirmative vote of a majority of the voting power of the shares present in person or represented by proxy at such meeting and entitled to vote on the subject matter shall be the act of the stockholders, except as otherwise required by law. The holders of a majority of the stock issued and outstanding and entitled to vote, present in person or represented by proxy, shall constitute a quorum for the transaction of business at all meetings of the stockholders.

Subject to preferences that may be applicable to any outstanding shares of preferred stock, holders of common stock are entitled to receive ratably such dividends as may be declared by our board of directors out of funds legally available for that purpose. In the event of our liquidation, dissolution or winding up, the holders of common stock are entitled to share ratably in all assets remaining after the payment of liabilities, subject to the prior distribution rights of preferred stock then outstanding. Holders of common stock have no preemptive, conversion or subscription rights. There are no redemption or sinking fund provisions applicable to the common stock.

Preferred Stock

Our board of directors has the authority, without further action by our stockholders, to issue up to 5,000,000 shares of preferred stock in one or more series and to fix the rights, preferences, privileges and restrictions thereof. These rights, preferences and privileges could include dividend rights, conversion rights, voting rights, terms of redemption, liquidation preferences, sinking fund terms and the number of shares constituting, or the designation of, such series, any or all of which may be greater than the rights of common stock. The issuance of our preferred stock could adversely affect the voting power of holders of common stock and the likelihood that such holders will receive dividend payments and payments upon our liquidation. In addition, the issuance of preferred stock could have the effect of delaying, deferring or preventing a change in control of our company or other corporate action. There

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are no shares of preferred stock currently outstanding, and we have no present plans to issue any shares of preferred stock.

Warrants

In connection with our loan and security agreement with Hercules Technology III, L.P., or Hercules, in March 2014 and as amended in September 2014, we issued to Hercules warrants, which, upon the closing of our initial public offering in July 2015, became exercisable for up to 70,833 shares of our common stock at an exercise price of \$12.00 per share pursuant to the terms thereof. The warrants may be exercised at the option of the holder either by delivery of the exercise price in cash or by a cashless exercise.

Registration Rights

Certain of our stockholders hold registration rights pursuant to (i) the Amended and Restated Investors' Rights Agreement, dated as of June 9, 2015, by and between us and certain of our stockholders, or the Investor Rights Agreement, and (ii) the Registration Rights Agreement. All fees, costs and expenses of underwritten registrations will be borne by us and all selling expenses, including underwriting discounts and selling commissions, will be borne by the holders of the shares being registered.

Pursuant to the Registration Rights Agreement, we are obligated to file a registration statement on Form S-3 with the SEC registering the resale of all of the shares of our common stock issuable upon conversion of the Notes issued to the selling stockholders pursuant to the Facility Agreement. This prospectus is a part of the registration statement we have filed in order to satisfy our obligations under the Registration Rights Agreement.

The Investor Rights Agreement provides for various registration rights, including demand registration rights, short-form registration rights and piggyback registration rights, all as described below:

Demand registration rights

The holders of 423,366 shares of our common stock are entitled to demand registration rights. Under the terms of the Investor Rights Agreement, we will be required, upon the written request of holders of a majority of the then-outstanding shares of Registrable Securities, as such term is defined in the Investor Rights Agreement, requesting registration of at least 40% of the then-outstanding shares of Registrable Securities, to use our commercially reasonable efforts to effect the registration of such shares for public resale. We are required to effect only two registrations pursuant to this provision of the Investor Rights Agreement.

Form S-3 registration rights

If at any time we become entitled under the Securities Act to register our shares on Form S-3 and the holders of at least 20% of the then-outstanding Registrable Securities request in writing that we register their shares for public resale on Form S-3 with an aggregate price to the public of the shares to be registered, net of underwriting discounts and commissions, of at least \$3.0 million, we will be required to effect such registration; provided, however, that if our board of directors determines, in good faith, that such registration would be materially detrimental to us and our stockholders at such time, we may defer the registration for up to 60 days. We are only obligated to effect up to two registrations on Form S-3 within any twelve month period.

Piggyback registration rights

The holders of 423,366 shares of our common stock are entitled to piggyback registration rights. If we register any of our securities either for our own account or for the account of other security holders, the holders of these shares are entitled to include their shares in the registration. Subject to certain exceptions, we and the underwriters may limit the number of shares included in the underwritten offering if the underwriters believe that including these shares would adversely affect the offering.

Indemnification

Our Investor Rights Agreement contains customary cross-indemnification provisions, under which we are obligated to indemnify holders of registrable securities in the event of material misstatements or omissions in the registration statement attributable to us, and they are obligated to indemnify us for material misstatements or omissions attributable to them.

Termination of registration rights

The registration rights granted under the Investor Rights Agreement will terminate on July 28, 2020, or, with respect to any holder of registrable securities, such earlier time as all such registrable securities held by such holder are available for resale without limitation during a three-month period without registration, pursuant to Rule 144 or another similar exemption under the Securities Act.

Anti-Takeover Provisions

Our amended and restated certificate of incorporation and amended and restated bylaws contain certain provisions that are intended to enhance the likelihood of continuity and stability in the composition of the board of directors and which may have the effect of delaying, deferring or preventing a future takeover or change in control of the company unless such takeover or change in control is approved by the board of directors.

Classified board

Our amended and restated certificate of incorporation provides that our board of directors will be divided into three classes of directors, with the classes as nearly equal in number as possible. As a result, approximately one-third of our board of directors will be elected each year. The classification of directors will have the effect of making it more difficult for stockholders to change the composition of our board. Our amended and restated certificate of incorporation also provides that, subject to any rights of holders of preferred stock to elect additional directors under specified circumstances, the number of directors will be fixed exclusively pursuant to a resolution adopted by our board of directors. Our board of directors currently has seven members.

Action by written consent; special meetings of stockholders

Our amended and restated certificate of incorporation provides that stockholder action can be taken only at an annual or special meeting of stockholders and cannot be taken by written consent in lieu of a meeting. Our amended and restated certificate of incorporation and amended and restated bylaws also provides that, except as otherwise required by law, special meetings of the stockholders can be called only by or at the direction of the board of directors pursuant to a resolution adopted by a majority of the total number of directors. Stockholders will not be permitted to call a special meeting or to require the board of directors to call a special meeting.

Removal of directors

Our amended and restated certificate of incorporation provides that our directors may be removed only for cause by the affirmative vote of at least 75% of the votes that all our stockholders would be entitled to cast in an annual election of directors, voting together as a single class, at a meeting of the stockholders called for that purpose. This requirement of a supermajority vote to remove directors could enable a minority of our stockholders to prevent a change in the composition of our board.

Advance notice procedures

Our amended and restated bylaws establish an advance notice procedure for stockholder proposals to be brought before an annual meeting of our stockholders, including proposed nominations of persons for election to the board of directors. Stockholders at an annual meeting will only be able to consider proposals or nominations specified in the notice of meeting or brought before the meeting by or at the direction of the board of directors or by a stockholder who was a stockholder of record on the record date for the meeting, who is entitled to vote at the meeting and who has given our Secretary timely written notice, in proper form, of the stockholder's intention to bring that business before the meeting. Although our amended and restated bylaws do not give the board of directors the power to approve or disapprove stockholder nominations of candidates or proposals regarding other business to be conducted at a special or annual meeting, our amended and restated bylaws may have the effect of precluding the conduct of certain business at a meeting if the proper procedures are not followed or may discourage or deter a potential acquirer from conducting a solicitation of proxies to elect its own slate of directors or otherwise attempting to obtain control of our company.

Super majority approval requirements

The Delaware General Corporation Law generally provides that the affirmative vote of a majority of the shares entitled to vote on any matter is required to amend a corporation's certificate of incorporation or bylaws, unless either a corporation's certificate of incorporation or bylaws requires a greater percentage. A majority vote of our board of directors or the affirmative vote of holders of at least 75% of the total votes of our outstanding shares of capital stock entitled to vote with respect thereto, voting together as a single class, will be required to amend, alter, change or repeal the bylaws. In addition, the affirmative vote of the holders of at least 75% of the total votes of our outstanding shares of capital stock entitled to vote with respect thereto, voting together as a single class, will be required to amend, alter, change or repeal, or to adopt any provisions inconsistent with, any of the provisions in our certificate of incorporation relating to amendments to our certificate of incorporation and bylaws and as described under "Action by written consent; special meetings of stockholders", "Classified board" and "Removal of directors" above. This requirement of a supermajority vote to approve amendments to our bylaws and certificate of incorporation could enable a minority of our stockholders to exercise veto power over any such amendments.

Authorized but unissued shares

Our authorized but unissued shares of common stock and preferred stock will be available for future issuance without stockholder approval. These additional shares may be utilized for a variety of corporate purposes, including future public offerings to raise additional capital and corporate acquisitions. The existence of authorized but unissued shares of common stock and preferred stock could render more difficult or discourage an attempt to obtain control of a majority of our common stock by means of a proxy contest, tender offer, merger or otherwise.

Exclusive forum

Our amended and restated certificate of incorporation provides that, subject to limited exceptions, the state or federal courts located in the State of Delaware will be the sole and exclusive forum for (1) any derivative action or proceeding brought on our behalf, (2) any action asserting a claim of breach of a fiduciary duty owed by any of our directors, officers or other employees to us or our stockholders, (3) any action asserting a claim against us arising pursuant to any provision of the Delaware General Corporation Law, our certificate of incorporation or our bylaws, or (4) any other action asserting a claim against us that is governed by the internal affairs doctrine. Any person or entity purchasing or otherwise acquiring any interest in shares of our capital stock shall be deemed to have notice of and to have consented to the provisions of our certificate of incorporation described above. Although we believe these provisions benefit us by providing increased consistency in the application of Delaware law for the specified types of actions and proceedings, the provisions may have the effect of discouraging lawsuits against our directors and officers. The enforceability of similar choice of forum provisions in other companies' certificates of incorporation has been challenged in legal proceedings, and it is possible that, in connection with one or more actions or proceedings described above, a court could find the choice of forum provisions contained in our certificate of incorporation to be inapplicable or unenforceable.

Section 203 of the Delaware General Corporation Law

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

Under Section 203, a business combination between a corporation and an interested stockholder is prohibited unless it satisfies one of the following conditions: before the stockholder became interested, the board of directors approved either the business combination or the transaction which resulted in the stockholder becoming an interested stockholder; upon consummation of the transaction which resulted in the stockholder becoming an interested stockholder, the interested stockholder owned at least 75% of the voting stock of the corporation outstanding at the time the transaction commenced, excluding for purposes of determining the voting stock outstanding, shares owned by persons who are directors and also officers, and employee stock plans, in some instances; or at or after the time the stockholder became interested, the business combination was approved by the board of directors of the corporation and authorized at an annual or special meeting of the stockholders by the affirmative vote of at least two-thirds of the outstanding voting stock which is not owned by the interested stockholder.

A Delaware corporation may "opt out" of these provisions with an express provision in its original certificate of incorporation or an express provision in its certificate of incorporation or bylaws resulting from a stockholders' amendment approved by at least a majority of the outstanding voting shares. We have not opted out of these provisions. As a result, mergers or other takeover or change in control attempts of us may be discouraged or prevented.

Transfer Agent and Registrar

The transfer agent and registrar for our common stock is American Stock Transfer & Trust Company, LLC.

Listing

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

LEGAL MATTERS

Certain legal matters in connection with this offering will be passed upon for us by Goodwin Procter LLP, Boston, Massachusetts. Any underwriters will also be advised about the validity of the securities and other legal matters by their own counsel, which will be named in the applicable prospectus supplement.

EXPERTS

The consolidated financial statements and the related consolidated financial statement schedule of Neos Therapeutics, Inc. appearing in our Annual Report on Form 10-K for the year ended December 31, 2017, and as retrospectively revised for the adoption of ASC 606, *Revenue from Contracts with Customers*, in the Current Report on Form 8-K dated December 11, 2018, have been audited by RSM US LLP, independent registered public accounting firm, as set forth in their reports thereon, included therein, and incorporated herein by reference. Such consolidated financial statements are incorporated herein by reference in reliance upon such report given on the authority of such firm as experts in accounting and auditing.

WHERE YOU CAN FIND MORE INFORMATION

This prospectus is part of a registration statement that we have filed with the SEC. Certain information in the registration statement has been omitted from this prospectus in accordance with the rules of the SEC. We are subject to the information requirements of the Exchange Act and, in accordance therewith, file annual, quarterly and special reports, proxy statements and other information with the SEC. These documents and any other documents on file with the SEC may be accessed through the SEC's electronic data gathering, analysis and retrieval system, or EDGAR, via electronic means, including the SEC's home page on the Internet (www.sec.gov).

We have the authority to designate and issue more than one class or series of stock having various preferences, conversion and other rights, voting powers, restrictions, limitations as to dividends, qualifications, and terms and conditions of redemption. See "Description of Capital Stock." We will furnish a full statement of the relative rights and preferences of each class or series of our stock which has been so designated and any restrictions on the ownership or transfer of our stock to any stockholder upon request and without charge. Written requests for such copies should be directed to Neos Therapeutics, Inc., 2940 N. Hwy 360, Grand Prairie, TX 75050, Attention: Secretary, or by telephone request to (972) 408-1300. Our website is located at www.neostx.com. Information contained on our website is not incorporated by reference into this prospectus and, therefore, is not part of this prospectus or any accompanying prospectus supplement.

INCORPORATION BY REFERENCE

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

- Annual Report on Form 10-K for the year ended December 31, 2017;
- The information specifically incorporated by reference into our Annual Report on Form 10-K for the year ended December 31, 2017 from our definitive proxy statement on Schedule 14A (other than information furnished rather than filed), which was filed with the SEC on April 30, 2018;
- Quarterly Report on Form 10-Q filed for the quarter ended March 31, 2018, filed with the SEC on May 10, 2018, for the quarter ended June 30, 2018, filed with the SEC on August 9, 2018, for the quarter ended September 30, 2018, filed with the SEC on November 9, 2018;
- Current Reports on Form 8-K filed on April 27, 2018, June 22, 2018, June 27, 2018 (only with respect to item(s) deemed "filed" with the SEC contained in such Current Report), October 24, 2018, November 5, 2018, November 6, 2018, November 8, 2018, November 30, 2018 (only with respect to item(s) deemed "filed" with the SEC contained in such Current Report) and December 11, 2018; and
- The description of our common stock contained in our registration statement on Form 8-A (Registration No. 001-37508) filed with the SEC on July 20, 2015 under Section 12(b) of the Exchange Act, including any amendments or reports filed for the purpose of updating such description.

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Upon request, we will provide, without charge, to each person, including any beneficial owner, to whom a copy of this prospectus is delivered, a copy of the documents incorporated by reference into this prospectus but not delivered with the prospectus. You may request a copy of these filings, and any exhibits we have specifically incorporated by reference as an exhibit in this prospectus, at no cost by writing or telephoning us at the following address:

Neos Therapeutics, Inc., 2940 N. Hwy 360, Grand Prairie, TX 75050, Attention: Secretary, or by telephone request to (972) 408-1300.

You may also access these documents, free of charge on the SEC's website at www.sec.gov or on our website at www.neostx.com. Information contained on our website is not incorporated by reference into this prospectus, and you should not consider any information on, or that can be accessed from, our website as part of this prospectus or any accompanying prospectus supplement.

This prospectus is part of a registration statement we filed with the SEC. We have incorporated exhibits into this registration statement. You should read the exhibits carefully for provisions that may be important to you.

You should rely only on the information incorporated by reference or provided in this prospectus or any prospectus supplement. We have not authorized anyone to provide you with different information. We are not making an offer of these securities in any state where the offer is not permitted. You should not assume that the information in this prospectus or in the documents incorporated by reference is accurate as of any date other than the date on the front of this prospectus or those documents.

PROSPECTUS

3,796,668 shares



Common Stock

December 20, 2018

We have not authorized any dealer, salesperson or other person to give any information or represent anything not contained in 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 securities 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.
