

CALCULATION OF REGISTRATION FEE

| Title of Securities to be Registered | 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 | 892,679 shares | \$9.37 (2) | \$8,364,402 (2) | \$970 |

In accordance with Rule 416 under the Securities Act of 1933, as amended, this registration statement shall be (1) deemed to cover any additional securities that may from time to time be offered or issued to prevent dilution resulting from stock splits, stock dividends or similar transactions.

Estimated solely for the purpose of calculating the registration fee pursuant to Rules 457(c) and 457(h) of the (2) Securities Act of 1933, as amended, and based upon the average of the high and low prices of the Registrant's Common Stock as reported on The Nasdaq Global Market on February 27, 2017.

Statement of Incorporation by Reference

This Registration Statement on Form S-8, relating to the 2014 Stock Incentive Plan of Concert Pharmaceuticals, Inc. (the "Registrant"), is being filed for the purpose of registering additional securities of the same class as other securities for which a Registration Statement on Form S-8 has previously been filed and is effective. Accordingly, this Registration Statement incorporates by reference the contents of the Registration Statement on Form S-8, File No. 333-195125, filed with the Securities and Exchange Commission on April 8, 2014 by the Registrant, relating to the Registrant's Amended and Restated 2006 Stock Option and Grant Plan and 2014 Stock Incentive Plan, except for Item 8, Exhibits, with respect to which the Exhibit Index immediately preceding the exhibits attached hereto is incorporated herein by reference.

SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, the registrant certifies that it has reasonable grounds to believe that it meets all of the requirements for filing on Form S-8 and has duly caused this registration statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the city of Lexington, Commonwealth of Massachusetts, on this 6th day of March, 2017.

CONCERT PHARMACEUTICALS, INC.

By: /s/ Roger. D Tung
 Roger D. Tung, Ph.D.
 President and Chief Executive Officer

POWER OF ATTORNEY AND SIGNATURES

We, the undersigned officers and directors of Concert Pharmaceuticals, Inc., hereby severally constitute and appoint Roger D. Tung, Nancy Stuart and D. Ryan Daws, and each of them singly, our true and lawful attorneys with full power to them, and each of them singly, to sign for us and in our names in the capacities indicated below, the registration statement on Form S-8 filed herewith and any and all subsequent amendments to said registration statement, and generally to do all such things in our names and on our behalf in our capacities as officers and directors to enable Concert Pharmaceuticals, Inc. to comply with the provisions of the Securities Act of 1933, as amended, and all requirements of the Securities and Exchange Commission, hereby ratifying and confirming our signatures as they may be signed by our said attorneys, or any of them, to said registration statement and any and all amendments thereto. Pursuant to the requirements of the Securities Act of 1933, this registration statement has been signed by the following persons in the capacities and on the dates indicated.

| Signature | Title | Date |
|--|--|---------------|
| /s/ Roger D. Tung Roger D. Tung, Ph.D. | Director, President and Chief Executive Officer (Principal Executive Officer) | March 6, 2017 |
| /s/ Ryan Daws Ryan Daws | Chief Financial Officer (Principal Financial Officer and Principal Accounting Officer) | March 6, 2017 |
| /s/ Richard H. Aldrich Richard H. Aldrich | Director | March 6, 2017 |
| /s/ Thomas G. Auchincloss Thomas G. Auchincloss | Director | March 6, 2017 |
| /s/ Ronald W. Barrett Ronald W. Barrett, Ph.D. | Director | March 6, 2017 |
| /s/ Meghan FitzGerald Meghan FitzGerald, Ph.D. | Director | March 6, 2017 |
| /s/ Christine van Heek Christine van Heek | Director | March 6, 2017 |
| /s/ Peter Barton Hutt Peter Barton Hutt | Director | March 6, 2017 |
| /s/ Wilfred E. Jaeger Wilfred E. Jaeger, M.D. | Director | March 6, 2017 |
| /s/ Wendell Wierenga, Wendell Wierenga, Ph.D. | Director | March 6, 2017 |

EXHIBIT INDEX

| Exhibit Number | Description of Exhibit | Incorporated by Reference | | | Exhibit Number | Filed Herewith |
|----------------|--|---------------------------|-------------|-------------------|----------------|----------------|
| | | Form | File Number | Date of Filing | | |
| 4.1 | Restated Certificate of Incorporation of the Registrant | 8-K | 001-36310 | February 20, 2014 | 3.1 | |
| 4.2 | Amended and Restated By-Laws of the Registrant | 8-K | 001-36310 | February 20, 2014 | 3.2 | |
| 5.1 | Opinion of Goodwin Procter LLP, counsel to the Registrant | | | | | X |
| 23.1 | Consent of Goodwin Procter LLP (included in Exhibit 5.1) | | | | | X |
| 23.2 | Consent of Ernst & Young LLP | | | | | X |
| 24.1 | Power of attorney (included on the signature pages of this registration statement) | | | | | X |
| 99.1 | 2014 Stock Incentive Plan | S-1 | 333-193335 | February 3, 2014 | 10.6 | |