

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

FORM S-8

REGISTRATION STATEMENT
UNDER THE SECURITIES ACT OF 1933

RESPIRERX PHARMACEUTICALS INC.

(Exact name of registrant as specified in its charter)

Delaware
*(State or other jurisdiction of
incorporation or organization)*

33-0303583
*(I.R.S. Employer
Identification No.)*

126 Valley Road, Suite C
Glen Rock, New Jersey 07452
(Address of Principal Executive Offices)

Amended and Restated RespireRx Pharmaceuticals Inc. 2015 Stock and Stock Option Plan
(Full title of the plan)

James S. Manuso, Ph.D.
President and Chief Executive Officer
RespireRx Pharmaceuticals Inc.
126 Valley Road, Suite C
Glen Rock, New Jersey 07452
(Name and address of agent for service)

(201) 444-4947
(Telephone number, including area code, of agent for service)

Copies to:
James Fischer, Esq.
Elizabeth A. Diffley, Esq.
Drinker Biddle & Reath LLP
600 Campus Drive
Florham Park, NJ 07932-1047

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

Large accelerated filer	[]	Accelerated filer	[]
Non-accelerated filer	[]	Smaller reporting company	[X]
<i>(Do not check if a smaller reporting company)</i>			

CALCULATION OF REGISTRATION FEE

Title of Securities To Be Registered	Amount To Be Registered ⁽¹⁾	Proposed Maximum Offering Price Per Share ⁽²⁾	Proposed Maximum Aggregate Offering Price ⁽²⁾	Amount Of Registration Fee ⁽²⁾
Common Stock, \$0.001 par value	250,000,000 shares	\$ 0.0176	\$ 4,400,000	\$ 443.08

(1) The number of shares of common stock, par value \$0.001 per share ("Common Stock"), of RespireRX Pharmaceuticals Inc. (the "Registrant"), stated above consists of additional shares of Common Stock reserved under the Amended and Restated RespireRx Pharmaceuticals Inc. 2015 Stock and Stock Option Plan (formerly the Cortex Pharmaceuticals, Inc. 2015 Stock and Stock Option Plan, the "2015 Plan"). Pursuant to Rule 416(a) under the Securities Act of 1933 (as amended, the "Securities Act"), the shares being registered hereunder include such indeterminate number of shares of the Registrant's Common Stock as may be issued from time to time with respect to the shares being registered hereunder as a result of stock splits, stock dividends or similar transactions.

(2)

Estimated solely for the purpose of calculating the registration fee, in accordance with Rule 457(h)(1) under the Securities Act, on the basis of the price of securities of the same class, as determined in accordance with Rule 457(c) under the Securities Act, using the average of the high and low prices reported by the OTCQB for our Common Stock on May 16, 2016, which was \$0.0176 per share.

EXPLANATORY NOTE

This Registration Statement on Form S-8 is being filed pursuant to General Instruction E to Form S-8 under the Securities Act of 1933, as amended, for the purpose of registering an additional 250,000,000 shares of common stock, \$0.001 par value (the “Common Stock”), of RespireRx Pharmaceuticals Inc. (formerly known as Cortex Pharmaceuticals, Inc., the “Company” or the “Registrant”) that may be offered pursuant to the Amended and Restated RespireRx Pharmaceuticals Inc. 2015 Stock and Stock Option Plan (formerly the Cortex Pharmaceuticals, Inc. 2015 Stock and Stock Option Plan, the “2015 Plan”).

The contents of the Registrant’s previously filed Registration Statement on Form S-8 filed with the Securities and Exchange Commission (the “Commission”) on November 13, 2015 (Registration No. 333-208017) is hereby incorporated herein by reference to the extent not otherwise amended or superseded by the contents hereof.

The prospectus documents containing the information specified in Part I of Form S-8 need not be filed with the Commission either as part of this Registration Statement or as a prospectus or prospectus supplement pursuant to Rule 424 under the Securities Act, but will be given to the employees as specified by Rule 428(b)(1) under the Securities Act.

PART II
INFORMATION REQUIRED IN THE REGISTRATION STATEMENT

Amended and Restated RespireRx Pharmaceuticals Inc. 2015 Stock and Stock Option Plan

On June 30, 2015, the Company's Board of Directors approved the Cortex Pharmaceuticals, Inc. 2015 Stock and Stock Option Plan (as amended, the "2015 Plan") with 150,000,000 shares reserved for issuance thereunder. The number of shares issuable under the 2015 Plan was subsequently increased to 250,000,000 shares on August 18, 2015. On March 31, 2016 the number of shares available under the 2015 Plan was further increased by an additional 250,000,000, bringing the total aggregate amount covered by the plan to 500,000,000 shares. In connection with that amendment, the Company also changed the name of the 2015 Plan to reflect the new name of the Company, RespireRx Pharmaceuticals Inc.

The Company does not intend to submit the 2015 Plan for stockholder approval. 9,064,286 shares have been issued under the 2015 Plan, with an additional 387,428,572 shares potentially to be issued in connection with issued and outstanding options. Currently 103,507,142 shares remain available for issuance under the 2015 Plan. Accordingly, this registration statement covers 250,000,000 of the shares that remain in the 2015 Plan, either as simply unissued shares or unissued shares potentially to be issued in connection with issued and outstanding options, which is in addition to the 240,935,714 shares issuable under the 2015 Plan that were previously registered on Form S-8 filed November 13, 2015.

Item 3. Incorporation of Documents by Reference.

The Securities and Exchange Commission, or the SEC, allows us to "incorporate by reference" the information we file with it. This means that we can disclose important information to you by referring you to those documents. The information we incorporate by reference is an important part of this registration statement, and later information we file with the SEC will automatically update and supersede this information. Any such information so updated or superseded shall not be deemed, except as so updated or superseded, to constitute part of this registration statement. The Company hereby incorporates by reference into this Registration Statement the following documents filed with the Commission:

- (a) the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2015;
- (b) the Company's Quarterly Report on Form 10-Q for the quarterly period ended March 31, 2016, filed with the SEC on May 13, 2016
- (c) the Company's Current Reports on Form 8-K filed on January 11, 2016; February 3, 2016; April 6, 2016; April 11, 2016 (and the amendment thereto on Form 8-K/A filed on April 12, 2016); and May 10, 2016; and
- (d) the description of the Company's Common Stock, \$0.001 par value per share, contained in the Company's Amendment No. 1 to Registration Statement on Form 8-A (File No. 001-16467) filed with the Securities and Exchange Commission on February 15, 2002, including any amendment or report filed for the purpose of updating such description.

In addition, all documents and reports subsequently filed by the Company pursuant to Sections 13(a), 13(c), 14 and 15(d) of the Securities Exchange Act of 1934, prior to the filing of a post-effective amendment to this Registration Statement which indicates that all securities offered have been sold or which deregisters all securities then remaining unsold, shall be deemed to be incorporated by reference in this Registration Statement and to be part hereof from the date of filing of such documents, except as to any portion of any future annual or quarterly report to stockholders or document that is not deemed filed under such provisions. For the purposes of this registration statement, any statement in a document incorporated by reference shall be deemed to be modified or superseded to the extent that a statement contained in this registration statement modifies or supersedes a statement in such document. Any statement so modified or superseded shall not be deemed, except as so modified or superseded, to constitute a part of this registration statement. Unless specifically stated otherwise, none of the information that we disclose under Items 2.02 or 7.01 in our Current Reports on Form 8-K, nor any exhibits relating to such information, furnished to the SEC prior to, on or subsequent to the date of this registration statement will be deemed to be incorporated by reference into, or otherwise included in, this registration statement.

Item 4. Description of Securities.

Not applicable.

Item 5. Interests of Named Experts and Counsel.

The validity of the issuance of Common Stock registered hereby is passed on for the Company by its outside counsel, Drinker Biddle & Reath LLP. In June 2015, the Company issued options to purchase 28,571,429 shares of its common stock under the 2015 Plan to Drinker Biddle & Reath LLP, as partial payment for services previously provided and invoiced. The options expire on June 30, 2020 and have an exercise price of \$0.0175 per share.

Item 6. Indemnification of Directors and Officers.

Section 102(b)(7) of the Delaware General Corporation Law, or the DGCL, enables a corporation in its original certificate of incorporation or an amendment thereto to eliminate or limit the personal liability of a director to the corporation or its stockholders for monetary damages for breach of the director's fiduciary duty, except (i) for any breach of the director's duty of loyalty to the corporation or its stockholders, (ii) for acts or omissions not in good faith or which involve intentional misconduct or a knowing violation of law, (iii) pursuant to Section 174 of the DGCL (providing for liability of directors for unlawful payment of dividends or unlawful stock purchases or redemptions) or (iv) for any transaction from which the director derived an improper personal benefit.

Section 145(a) of the DGCL empowers a corporation to indemnify any person who was or is threatened to be made a party to any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative or investigative (other than an action by or in the right of the corporation) by reason of the fact that he or she is or was a director, officer, employee or agent of the corporation, or is or was serving at the request of the corporation as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise, against expenses (including attorneys' fees), judgments, fines and amounts paid in settlement actually and reasonably incurred by him or her in connection with such action, suit or proceeding if he or she acted in good faith and in a manner he or she reasonably believed to be in or not opposed to the best interests of the corporation, and, with respect to any criminal action or proceeding, had no reasonable cause to believe his or her conduct was unlawful.

Section 145(b) of the DGCL empowers a corporation to indemnify any person who was or is a party or is threatened to be made a party to any threatened, pending or completed action or suit by or in the right of the corporation to procure a judgment in its favor by reason of the fact that he or she is or was a director, officer, employee or agent of the corporation, or is or was serving at the request of the corporation as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise, against expenses (including attorneys' fees) actually and reasonably incurred by him or her in connection with the defense or settlement of such action or suit if he or she acted in good faith and in a manner he or she reasonably believed to be in or not opposed to the best interests of the corporation and except that no indemnification shall be made in respect of any claim, issue or matter as to which such person shall have been adjudged to be liable to the corporation unless and only to the extent that the Court of Chancery or the court in which such action or suit was brought shall determine upon application that, despite the adjudication of liability but in view of all of the circumstances of the case, such person is fairly and reasonably entitled to indemnity for such expenses which the Court of Chancery or such other court shall deem proper.

Section 145 of the DGCL further provides that (i) to the extent a present or former director or officer has been successful on the merits or otherwise in the defense of any action, suit or proceeding referred to in subsections (a) and (b) of Section 145 of the DGCL, or in the defense of any claim, issue or matter therein, he or she shall be indemnified against expenses (including attorneys' fees) actually and reasonably incurred by him or her in connection therewith; (ii) the indemnification and advancement of expenses provided for, by, or granted pursuant to, Section 145 of the DGCL shall not be deemed exclusive of any other rights to which the persons seeking indemnification may be entitled; and (iii) the corporation is empowered to purchase and maintain insurance on behalf of a present or former director, officer, employee or agent of the corporation, or any individual who is or was serving at the corporation's request as a director, officer or employee of another organization, against any liability asserted against him or her or incurred by him or her in any such capacity, or arising out of his or her status as such, whether or not the corporation would have the power to indemnify him or her against such liabilities under Section 145 of the DGCL.

As permitted by the DGCL, our restated certificate of incorporation, as amended, eliminates the liability of our directors to us or our stockholders for monetary damages for breach of fiduciary duty as a director, except to the extent otherwise prohibited by the DGCL. Our restated certificate of incorporation, as amended, provides that we will indemnify each person who was or is made a party to any proceeding by reason of the fact that such person is or was our director or officer against all expense, liability and loss reasonably incurred or suffered by such person in connection therewith to the fullest extent authorized by the DGCL. Our restated certificate of incorporation, as amended, also gives us the ability to enter into indemnification agreements with each of our directors and officers.

We also maintain liability insurance for our directors and officers.

Item 7. Exemption from Registration Claimed.

Not applicable.

Item 8. Exhibits.

A list of the exhibits required to be filed as a part of this Registration Statement on Form S-8 is set forth in the Exhibit Index, which is included elsewhere in this document and is incorporated herein by reference.

Item 9. 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 SEC pursuant to Rule 424(b) if, in the aggregate, the changes in volume and price represent no more than 20% change in the maximum aggregate offering price set forth in the "Calculation of Registration Fee" table in the effective registration statement; and

(iii) To include any material information with respect to the plan of distribution not previously disclosed in the registration statement or any material change to such information in the registration statement.

Provided, however, that paragraphs (a)(1)(i) and (a)(1)(ii) of this section do not apply if the information required to be included in a post-effective amendment by those paragraphs is contained in reports filed with or furnished to the 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.

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

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

(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 (and, where applicable, each filing of an employee benefit plan's annual report pursuant to section 15(d) of the Securities Exchange Act of 1934) that is incorporated by reference in the registration statement shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial *bona fide* offering thereof.

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

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 New York, State of New York, on the 18th day of May, 2016.

RESPIRERX PHARMACEUTICALS INC.

By: /s/ James S. Manuso, Ph.D.

James S. Manuso, Ph.D.
President and Chief Executive Officer

POWER OF ATTORNEY

We, the undersigned directors and officers of RespireRx Pharmaceuticals Inc., do hereby make, constitute and appoint James S. J. Manuso, Ph.D., Robert N. Weingarten, Jeff E. Margolis and Arnold S. Lippa, Ph.D., and each of them acting individually, our true and lawful attorneys-in-fact and agents, with power to act without any other and with full power of substitution, to do any and all acts and things in our name and behalf in our capacities as directors and officers, to sign any and all amendments (including post-effective amendments) to this registration statement, or any related registration statement that is to be effective upon filing under the Securities Act of 1933, as amended, 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 and about the premises, as fully to all intents and purposes as he or she might or could do in person, hereby ratifying and confirming all that each of said attorneys-in-fact and agents, or his or her substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

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

<u>Signature</u>	<u>Title</u>	<u>Date</u>
<u>/s/ James S. Manuso, Ph.D.</u> James S. Manuso, Ph.D.	President and Chief Executive Officer, Director and Vice Chairman of the Board (Principal Executive Officer)	May 18, 2016
<u>/s/ Robert N. Weingarten</u> Robert N. Weingarten	Vice President, Chief Financial Officer and Director (Principal Financial and Accounting Officer)	May 18, 2016
<u>/s/ Arnold S. Lippa, Ph.D.</u> Arnold S. Lippa, Ph.D.	Chief Scientific Officer, Director and Executive Chairman of the Board	May 18, 2016
<u>/s/ Jeff E. Margolis</u> Jeff E. Margolis	Vice President, Treasurer, Secretary and Director	May 18, 2016
<u>/s/ James E. Sapirstein</u> James E. Sapirstein	Director	May 18, 2016
<u>/s/ Kathryn MacFarlane</u> Kathryn MacFarlane	Director	May 18, 2016

EXHIBIT INDEX

Exhibit Number	Description
4.1	Amended and Restated RespireRX Pharmaceuticals Inc. 2015 Stock and Stock Option Plan, incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed on April 6, 2016.
5.1*	Opinion of Drinker Biddle & Reath LLP.
23.1*	Consent of Drinker Biddle & Reath LLP (included in Exhibit 5.1).
23.2*	Consent of Haskell & White LLP, independent registered public accounting firm.
24.1*	Power of Attorney (included on the signature page to this registration statement on Form S-8).

* Filed herewith

May 18, 2016

RespireRx Pharmaceuticals Inc.
126 Valley Road, Suite C
Glen Rock, New Jersey 07452

**Re: Registration Statement on Form S-8
Amended and Restated RespireRx Pharmaceuticals Inc. 2015 Stock and Stock Option Plan**

Ladies and Gentlemen:

We have acted as counsel to RespireRx Pharmaceuticals Inc., a Delaware corporation (the "Company"), in connection with the filing of a Registration Statement on Form S-8 by the Company under the Securities Act of 1933, as amended (the "Registration Statement"). The Registration Statement relates to an additional 250,000,000 shares of the Company's common stock, par value \$0.001 per share (the "Common Stock"), issuable pursuant to the Company's Amended and Restated 2015 Stock and Stock Option Plan (the "Plan") and such presently indeterminate number of shares of Common Stock that may be offered or issued to adjust for stock splits, stock dividends, or similar transactions. In that capacity, we have examined originals or copies, certified or otherwise identified to our satisfaction, of the Second Restated Certificate of Incorporation and the Bylaws of the Company, both as amended to date, the Registration Statement, the Plan, resolutions of the Board of Directors relating to the Plan and the issuance of the Common Stock, and such other documents and corporate records that we have deemed necessary for the issuance of this opinion.

In all cases, we have assumed the legal capacity of each natural person signing any of the documents and corporate records examined by us, the genuineness of signatures, the authenticity of documents submitted to us as originals, the conformity to authentic original documents of documents submitted to us as copies and the accuracy and completeness of all corporate records and other information made available to us by the Company. As to all issues of fact material to this opinion, we have examined and relied on certificates and other comparable documents of public officials and of officers of the Company.

This opinion is limited to the Delaware General Corporation Law. We express no opinion as to matters relating to securities or blue sky laws of any jurisdiction or any rules or regulations thereunder. For purposes of this opinion, we have assumed that a sufficient number of authorized but unissued shares of the Common Stock will be available for issuance pursuant to the Plan when the shares registered hereby are issued.

Based on the foregoing and having regard for such other legal considerations as we have deemed relevant, we are of the opinion that the shares of Common Stock have been duly authorized for issuance by all requisite action on the part of the Company and, when issued and paid for in accordance with the terms and conditions of the Plan, will be validly issued, fully paid and non-assessable by the Company.

We hereby consent to the filing of this opinion as an exhibit to the Registration Statement. In giving such consent, we do not admit that we are in the category of persons whose consent is required under Section 7 of the Securities Act of 1933, as amended.

Very truly yours,

/s/ Drinker Biddle & Reath LLP

DRINKER BIDDLE & REATH LLP

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We consent to the incorporation by reference in this Registration Statement on Form S-8 of RespireRx Pharmaceuticals Inc. (the "Company"), pertaining to its 2015 Stock and Stock Option Plan, of our report dated March 28, 2016, relating to our audit of the Company's consolidated financial statements as of December 31, 2015 and 2014 and for each of the years then ended, included in the Company's Annual Report on Form 10-K for the year ended December 31, 2015.

Our report dated March 28, 2016 contains an explanatory paragraph that states the Company does not have sufficient working capital to fund its operations and commitments. These conditions raise substantial doubt about the Company's ability to continue as a going concern. The consolidated financial statements do not include any adjustments that might result from the outcome of this uncertainty.

HASKELL & WHITE LLP

Irvine, California
May 18, 2016
