

**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)*

Jeff E. Margolis  
Senior Vice President, Chief Financial Officer, Treasurer, and Secretary  
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:  
Elizabeth A. Diffley  
Faegre Drinker Biddle & Reath LLP  
One Logan Square, Suite 2000  
Philadelphia, Pennsylvania 19103

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

Large accelerated filer	[ ]	Accelerated filer	[ ]
Non-accelerated filer	[ ]	Smaller reporting company	[X]
		Emerging Growth company	[ ]

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

**CALCULATION OF REGISTRATION FEE**

Title of 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	157,446,799 shares	\$ 0.0053	\$ 834,468	\$ 108.31

(1) The number of shares of common stock, par value \$0.001 per share (“Common Stock”), of RespireRx Pharmaceuticals Inc. (the “Company”), stated above consists of additional shares of Common Stock reserved under the Amended and Restated RespireRx Pharmaceuticals Inc. 2015 Stock and Stock Option Plan (the “2015 Plan”) pursuant to the amendments thereto. 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 Company’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 September 8, 2020, which was \$0.0053 per share.

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## EXPLANATORY NOTE UNDER GENERAL INSTRUCTION E

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, and consists only of those items required by General Instruction E. This Registration Statement is being filed for the purpose of registering an additional 157,446,799 shares of common stock, \$0.001 par value ("Common Stock"), of RespireRx Pharmaceuticals Inc. (the "Company") that may be offered pursuant to the Amended and Restated RespireRx Pharmaceuticals Inc. 2015 Stock and Stock Option Plan, as amended (the "2015 Plan").

The contents of the Company's previously filed Registration Statement on Form S-8 filed with the Securities and Exchange Commission on May 18, 2016 (Registration No. 333-211441) (the "2016 Form S-8") is hereby incorporated herein by reference to the extent not otherwise amended or superseded by the contents hereof.

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**PART II**  
**INFORMATION REQUIRED IN THE REGISTRATION STATEMENT**

Upon the filing of the 2016 Form S-8 on May 18, 2016, 500,000,000 shares were authorized to be issued under the 2015 Plan, 490,935,714 shares the issuance of which had been registered, in the aggregate, pursuant to the Company's Registration Statement on Form S-8 filed on November 13, 2015 and the 2016 Form S-8 (together, the "Previous Forms S-8"). On September 1, 2016, the Company effectuated a 325-to-1 reverse stock split (the "Reverse Stock Split") pursuant to the Third Certificate of Amendment of the Second Restated Certificate of Incorporation of RespireRx Pharmaceuticals Inc. (the "Charter Amendment"), which effectively reduced the shares authorized to be issued under the 2015 Plan from 500,000,000 to 1,538,461, and effectively reduced the number of those authorized shares covered by the Previous Forms S-8 from 490,935,714 to 1,510,570. The Charter Amendment is attached hereto as Exhibit 4.4 to this Registration Statement on Form S-8.

On January 17, 2017, the Board of Directors of the Company (the "Board") increased the number of shares authorized under the 2015 Plan by 1,500,000, bringing the total shares authorized to 3,038,461. On December 9, 2017, the Board further increased the number of shares authorized under the 2015 Plan by an additional 3,946,799, bringing the total number of shares authorized to be issued under the 2015 Plan to 6,985,260. On December 28, 2018, the Board further increased the number of shares authorized under the 2015 Plan by an additional 2,000,000, bringing the total number of shares authorized to be issued under the 2015 Plan to 8,985,260. On May 5, 2020, the Board further increased the number of shares authorized under the 2015 Plan by an additional 50,000,000, bringing the total number of shares authorized to be issued under the 2015 Plan to 58,985,260. On July 31, 2020, the Board further increased the number of shares authorized under the 2015 Plan by an additional 100,000,000, bringing the total number of shares authorized to be issued under the 2015 Plan to 158,985,260. The amendments to the 2015 Plan by which these authorized share increases were effected (the "2015 Plan Amendments") are attached hereto as Exhibits 4.9 through 4.13 to this Registration Statement on Form S-8.

This Registration Statement on Form S-8 covers 157,446,799 shares of Common Stock, the aggregate number of shares authorized to be issued under the 2015 Plan pursuant to the increases effected by the 2015 Plan Amendments.

The Company has not submitted, and does not intend to submit, the 2015 Plan for stockholder approval. 327,987 shares (as adjusted for the Reverse Stock Split) have been issued under the 2015 Plan, with an additional 54,623,559 shares potentially to be issued in connection with outstanding granted options. Currently, 104,033,715 shares unrelated to outstanding options remain available for issuance under the 2015 Plan. This Registration Statement on Form S-8 covers 157,446,799 of the 158,657,274 shares that remain in the 2015 Plan, either as unissued shares or as unissued shares potentially to be issued in connection with outstanding options. The 157,446,799 shares covered by this Registration Statement on Form S-8 are in addition to the 1,210,475 shares that remain issuable under the 2015 Plan that were registered on the Previous Forms S-8 (as adjusted for the Reverse Stock Split).

**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, Faegre Drinker Biddle & Reath LLP. In January 2017, the Company issued options to purchase 10,000 shares of its Common Stock under the 2015 Plan to Faegre Drinker Biddle & Reath LLP, as partial payment for services previously provided and invoiced. The options expire on January 17, 2022 and have an exercise price of \$3.90 per share.

**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 follows, and is incorporated herein by reference.

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## EXHIBIT INDEX

<b>Exhibit Number</b>	<b>Description</b>
4.1	<a href="#"><u>Second Restated Certificate of Incorporation dated May 19, 2010, incorporated by reference to the same numbered Exhibit to the Company's Current Report on Form 8-K filed May 24, 2010 (File no. 001-16467).</u></a>
4.2	<a href="#"><u>Certificate of Amendment of the (Second Restated) Certificate of Incorporation of Cortex Pharmaceuticals, Inc., incorporated by reference to Exhibit 3.2 to the Company's Current Report on Form 8-K filed on April 18, 2014 (File no. 001-16467).</u></a>
4.3	<a href="#"><u>Second Certificate of Amendment of the (Second Restated) Certificate of Incorporation of Cortex Pharmaceuticals, Inc., incorporated by reference to Exhibit 3.1 to the Company's Current Report on Form 8-K filed December 17, 2015 (File no. 001-16467).</u></a>
4.4	<a href="#"><u>Third Certificate of Amendment of the Second Restated Certificate of Incorporation of RespireRx Pharmaceuticals Inc., incorporated by reference to Exhibit 3.1 to the Company's Current Report on Form 8-K filed September 1, 2016 (File no. 001-16467).</u></a>
4.5	<a href="#"><u>Fourth Certificate of Amendment of Second Restated Certificate of Incorporation of RespireRx Pharmaceuticals Inc. (incorporated by reference to Exhibit 3.1 of the Company's Current Report on Form 8-K (file no. 001-16467) filed on May 6, 2020).</u></a>
4.6	<a href="#"><u>Certificate of Amendment of By-Laws of the Company, incorporated by reference to Exhibit 3.5 to the Company's Report on Form 8-K filed November 15, 2007. (File no. 001-16467)</u></a>
4.7	<a href="#"><u>By-Laws of the Company, as adopted March 4, 1987, and amended on October 8, 1996, incorporated by reference to Exhibit 3.2 to the Company's Annual Report on Form 10-KSB filed October 15, 1996 (File no. 001-17951).</u></a>
4.8	<a href="#"><u>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 (file no. 001-16467) filed on April 6, 2016).</u></a>
4.9	<a href="#"><u>First Amendment of the 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 (file no. 001-16467) filed on January 23, 2017).</u></a>
4.10	<a href="#"><u>Second Amendment of the Amended and Restated RespireRx Pharmaceuticals Inc. 2015 Stock and Stock Option Plan (incorporated by reference to Exhibit 10.3 to the Company's Current Report on Form 8-K (file no. 001-16467) filed on December 14, 2017).</u></a>
4.11	<a href="#"><u>Third Amendment of the Amended and Restated RespireRx Pharmaceuticals Inc. 2015 Stock and Stock Option Plan (incorporated by reference to Exhibit 99.4 of the Company's Current Report on Form 8-K (file no. 001-16467) filed on January 4, 2019).</u></a>
4.12	<a href="#"><u>Fourth Amendment of Amended and Restated RespireRx Pharmaceuticals Inc. 2015 Stock and Stock Option Plan (incorporated by reference to Exhibit 99.7 of the Company's Current Report on Form 8-K (file no. 001-16467) filed on May 6, 2020).</u></a>
4.13	<a href="#"><u>Fifth Amendment of Amended and Restated RespireRx Pharmaceuticals Inc. 2015 Stock and Stock Option Plan (incorporated by reference to Exhibit 99.14 of the Company's Current Report on Form 8-K (file no. 001-16467) filed on August 3, 2020).</u></a>
5.1*	<a href="#"><u>Opinion of Faegre Drinker Biddle &amp; Reath LLP.</u></a>
23.1*	<a href="#"><u>Consent of Faegre Drinker Biddle &amp; Reath LLP (included in Exhibit 5.1).</u></a>
23.2*	<a href="#"><u>Consent of Haskell &amp; White LLP, independent registered public accounting firm.</u></a>
24.1*	<a href="#"><u>Power of Attorney (included on the signature page to this registration statement on Form S-8).</u></a>

\* Filed herewith

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## 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 Bridgehampton, State of New York, on the 15th day of September, 2020.

RESPIRERX PHARMACEUTICALS INC.

By: /s/ Jeff E. Margolis

Jeff E. Margolis.  
Senior Vice President, Chief Financial Officer, Treasurer and  
Secretary

## POWER OF ATTORNEY

We, the undersigned directors and officers of RespireRx Pharmaceuticals Inc., do hereby make, constitute and appoint 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/ Timothy Jones</u> Timothy Jones	<i>President, Chief Executive Officer and Director</i>	September 15, 2020
<u>/s/ Arnold S. Lippa, Ph.D.</u> Arnold S. Lippa Ph.D.	<i>Chief Scientific Officer, Director and Executive Chairman of the Board</i>	September 15, 2020
<u>/s/ Jeff E. Margolis</u> Jeff E. Margolis	<i>Senior Vice President, Chief Financial Officer, Secretary, Treasurer and Director</i>	September 15, 2020
<u>/s/ Kathryn MacFarlane</u> Kathryn MacFarlane	<i>Director</i>	September 15, 2020

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September 15, 2020

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 157,446,799 shares (the "Shares") of the Company's common stock, par value \$0.001 per share ("Common Stock"), issuable pursuant to the Company's Amended and Restated 2015 Stock and Stock Option Plan, as amended (the "2015 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.

For purposes of this opinion letter, 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, each as amended to date, the Registration Statement, the 2015 Plan, resolutions of the Board of Directors of the Company relating to the 2015 Plan and the issuance of the Shares, 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 relied on representations of officers of the Company and upon certificates and other comparable documents of public officials and of officers of the Company. Except as otherwise indicated, we have not undertaken any independent investigation of factual matters.

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 Common Stock will be available for issuance pursuant to the 2015 Plan when the Shares 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 have been duly authorized for issuance by all requisite action on the part of the Company and, when and if issued and paid for in accordance with the terms and conditions of the 2015 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/ Faegre Drinker Biddle & Reath LLP*

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FAEGRE DRINKER BIDDLE & REATH LLP

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**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, (as amended), of our report dated April 14, 2020, relating to our audit of the Company’s consolidated financial statements as of December 31, 2019 and 2018 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, 2019.

Our report dated April 14, 2020 contains an explanatory paragraph that states the Company has experienced recurring losses, negative cash flows from operations, has limited capital resources, and a net stockholders’ deficiency. These matters 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

*/s/ HASKELL & WHITE LLP*

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Irvine, California  
September 15, 2020

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