

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

**POST-EFFECTIVE AMENDMENT NO. 1  
TO  
FORM S-1  
REGISTRATION STATEMENT  
UNDER  
THE SECURITIES ACT OF 1933**

**Synthorx, Inc.**

(Exact name of registrant as specified in its charter)

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

**2834**  
(Primary Standard Industrial  
Classification Code Number)

**46-4709185**  
(I.R.S. Employer  
Identification Number)

**11099 N. Torrey Pines Road, Suite 190  
La Jolla, California 92121  
(858) 750-4700**

(Address, including zip code, and telephone number, including area code, of registrant's principal executive offices)

**Laura K. Shawver, Ph.D.  
President and Chief Executive Officer  
Synthorx, Inc.  
11099 N. Torrey Pines Road, Suite 190  
La Jolla, California 92037  
(858) 750-4700**

(Name, address, including zip code, and telephone number, including area code, of agent for service)

**Copies to:**

**Kenneth J. Rollins, Esq.  
Cooley LLP  
4401 Eastgate Mall  
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(858) 550-6000**

**Christian V. Kühlen, Esq.  
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**Cheston J. Larson, Esq.  
Matthew T. Bush, Esq.  
Latham & Watkins LLP  
12670 High Bluff Drive  
San Diego, California 92130  
(858) 523-5400**

**Approximate date of commencement of proposed sale to the public:** As soon as practicable after the effective date of this registration statement.

If any of the securities being registered on this form are to be offered on a delayed or continuous basis pursuant to Rule 415 under the Securities Act of 1933, check the following box.

If this form is filed to register additional securities for an offering pursuant to Rule 462(b) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering.

If this form is a post-effective amendment filed pursuant to Rule 462(c) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering.

If this form is a post-effective amendment filed pursuant to Rule 462(d) under the Securities Act, check the following box and list the Securities Act registration number of the earlier effective registration statement for the same offering.  333-228355

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

Large accelerated filer   
Non-accelerated filer

Accelerated filer   
Smaller reporting company   
Emerging growth company

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

**This post-effective amendment shall become effective upon filing with the Securities and Exchange Commission in accordance with Rule 462(d) under the Securities Act of 1933, as amended.**

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### Explanatory Note

This Post-Effective Amendment No. 1 (this "Amendment") relates to the Registrant's Registration Statement on Form S-1 (File No. 333-228355), as amended, declared effective on December 6, 2018 by the Securities and Exchange Commission. The Registrant is filing this Amendment for the sole purpose of replacing Exhibit 5.1 to the Registration Statement. This Amendment does not modify any provision of Part I or Part II of the Registration Statement other than Item 16(a) of Part II as set forth below.

### PART II INFORMATION NOT REQUIRED IN PROSPECTUS

#### Item 16. Exhibits and Financial Statement Schedules.

##### (a) Exhibits.

Exhibit Number	Description of Document
5.1	<a href="#">Opinion of Cooley LLP.</a>
23.2	<a href="#">Consent of Cooley LLP (included in Exhibit 5.1).</a>
24.1	<a href="#">Power of Attorney (included on the signature page of the Registration Statement on Form S-1, as amended (File No. 333-228355), filed with the Commission on November 13, 2018 and incorporated herein by reference).</a>





Kenneth J. Rollins  
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EXHIBIT 5.1

December 6, 2018

Synthorx, Inc.  
11099 North Torrey Pines Road, Suite 290  
La Jolla, California 92037

Ladies and Gentlemen:

You have requested our opinion, as counsel to Synthorx, Inc., a Delaware corporation (the "**Company**"), in connection with the filing by the Company of a Registration Statement (No. 333-228355) on Form S-1 (the "**Initial Registration Statement**") with the Securities and Exchange Commission, including a related prospectus which forms a part of the Initial Registration Statement (the "**Prospectus**"), and a Registration Statement on Form S-1 related thereto that is to be filed with the Commission pursuant to Rule 462(b) of Regulation C promulgated under the Act (the "**Rule 462(b) Registration Statement**") and, together with the Initial Registration Statement, the "**Registration Statements**"), covering an underwritten public offering of up to 13,699,636 shares (the "**Shares**") of the Company's common stock, par value \$0.001, including up to 1,786,909 Shares that may be sold pursuant to the exercise of an option to purchase additional Shares.

In connection with this opinion, we have (i) examined and relied upon (a) the Registration Statements and the Prospectus, (b) the Company's Amended and Restated Certificate of Incorporation and Amended and Restated Bylaws, each as currently in effect, (c) the Company's Amended and Restated Certificate of Incorporation, filed as Exhibit 3.2 to the Initial Registration Statement, and the Company's Amended and Restated Bylaws, filed as Exhibit 3.3 to the Initial Registration Statement, each of which is to be in effect immediately prior to the closing of the offering contemplated by the Registration Statements and (d) originals or copies certified to our satisfaction of such records, documents, certificates, memoranda and other instruments as in our judgment are necessary or appropriate to enable us to render the opinion expressed below, and (ii) assumed that the Amended and Restated Certificate of Incorporation referred to in sub-clause (i)(c) above will be filed with the Secretary of State of the State of Delaware prior to the closing of the offering contemplated by the Registration Statements. We have undertaken no independent verification with respect to such matters. We have assumed the genuineness and authenticity of all documents submitted to us as originals, and the conformity to originals of all documents, other than by the Company, submitted to us as copies and the due execution and delivery of all documents where due execution and delivery are a prerequisite to the effectiveness thereof. As to certain factual matters, we have relied upon a certificate of an officer of the Company and have not sought independently to verify such matters.

Our opinion is expressed only with respect to the General Corporation Law of the State of Delaware. We express no opinion to the extent that any other laws are applicable to the subject matter hereof and express no opinion and provide no assurance as to compliance with any federal or state securities law, rule or regulation.

On the basis of the foregoing, and in reliance thereon, we are of the opinion that the Shares, when sold and issued against payment therefor as described in the Registration Statements and the Prospectus, will be validly issued, fully paid and non-assessable.

We consent to the reference to our firm under the caption "Legal Matters" in the Prospectus included in the Initial Registration Statement, to the filing of this opinion as an exhibit to an amendment to the Initial Registration Statement filed pursuant to Rule 462(d) and to the filing of this opinion as an exhibit to the Rule 462(b) Registration Statement.

Sincerely,

Cooley LLP

/s/ Kenneth J. Rollins

Kenneth J. Rollins

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