

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

**Amendment No. 4 to  
FORM S-1**  
REGISTRATION STATEMENT  
*UNDER*  
*THE SECURITIES ACT OF 1933*

**FibroBiologics, 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)

**86-3329066**

(I.R.S. Employer  
Identification Number)

**455 E. Medical Center Blvd.  
Suite 300  
Houston, Texas 77598  
(281) 671-5150**

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

**Pete O'Heeron  
Chief Executive Officer  
FibroBiologics, Inc.  
455 E. Medical Center Blvd.  
Suite 300  
Houston, Texas 77598  
(281) 671-5150**

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

*Copies to:*

**Brian Fenske  
Norton Rose Fulbright US LLP  
1301 McKinney Street  
Suite 5100  
Houston, Texas 77010  
(713) 651-5151**

**Pete O'Heeron  
Chief Executive Officer  
FibroBiologics, Inc.  
455 E. Medical Center Blvd.  
Suite 300  
Houston, Texas 77598  
(281) 671-5150**

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

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, please 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 statement number of the earlier effective registration statement for the same offering.

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  Accelerated filer   
Non-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.

**The registrant hereby amends this registration statement on such date or dates as may be necessary to delay its effective date until the registrant shall file a further amendment which specifically states that this registration statement shall thereafter become effective in accordance with Section 8(a) of the Securities Act of 1933, as**

amended, or until the registration statement shall become effective on such date as the Securities and Exchange Commission acting pursuant to said Section 8(a), may determine.



**EXPLANATORY NOTE**

This Amendment No. 4 to the registration statement of FibroBiologics, Inc. on Form S-1 (Registration No. 333-275361) is being filed solely to provide an updated legal opinion in Exhibit 5.1.

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**PART II**

**INFORMATION NOT REQUIRED IN PROSPECTUS**

**Item 13. *Other Expenses of Issuance and Distribution***

The following table sets forth the costs and expenses payable by us in connection with this registration statement and the listing of our common stock. All amounts shown are estimates except for the SEC registration fee and the Nasdaq listing fee.

	<b>Amount</b>
SEC registration fee	\$ 10,969
Nasdaq listing fee	270,000
Legal fees and expenses	310,000
Accounting fees and expenses	222,000
Advisory fee	200,000
Printing and engraving expenses	6,000
Transfer agent fees and expenses	12,850
Miscellaneous expenses	5,000
<b>Total</b>	<b>\$ 1,036,819</b>

**Item 14. *Indemnification of Directors and Officers***

We are incorporated under the laws of the State of Delaware. Section 145 of the DGCL provides that a Delaware corporation may indemnify any person who was or is, 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 such corporation), by reason of the fact that such person is or was a director, officer, employee or agent of such corporation, or is or was serving at the request of such 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 the person in connection with such action, suit or proceeding, if the person acted in good faith and in a manner the person reasonably believed to be in or not opposed to best interests of the corporation and, with respect to any criminal action or proceeding, had no reasonable cause to believe the person's conduct was unlawful.

Section 145 of the DGCL also provides that Delaware corporation may indemnify any person who was or is, 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 by reason of the fact that such person is or was a director, officer, employee or agent of such corporation, or is or was serving at the request of such 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 such person in connection with the defense or settlement of such action or suit if such person acted in good faith and in a manner such person reasonably believed to be in or not opposed to the best interests of the corporation, except that no indemnification of any claim, issue or matter is permitted without judicial approval if such person is adjudged to be liable to the corporation.

Under the DGCL, where a present or former officer or director is successful on the merits or otherwise in the defense of any action referred to above, or in defense of any claim, issue or matter therein, the corporation must indemnify such present or former officer or director against the expenses (including attorney's fees) which such present or former officer or director actually and reasonably incurred in connection with such action (or claim, issue or matter therein).

Section 102(b)(7) of the DGCL permits a corporation to provide in its certificate of incorporation that a director of the corporation shall not be personally liable to the corporation or its stockholders for monetary damages for breach of fiduciary duties as a director, except for liability for any:

- breach of a director's duty of loyalty to the corporation or its stockholders;
- act or omission not in good faith or that involves intentional misconduct or a knowing violation of law;
- unlawful payment of dividends or unlawful stock purchase or redemption; or
- transaction from which the director derived an improper personal benefit.

Our amended and restated certificate of incorporation which will become effective in connection with the effectiveness of the registration statement of which this prospectus forms a part, will contain a provision that precludes any director of ours from being personally liable to us or our stockholders for monetary damages for breach of fiduciary duty as a director, except for the aforementioned liabilities which we are not permitted to eliminate or limit under Section 107(b)(7) of the DGCL.

In addition, our amended and restated certificate of incorporation and bylaws, in each case, which will become effective in connection with the effectiveness of the registration statement of which this prospectus forms a part, will require us to indemnify, and advance expenses to, to the fullest extent permitted by law, any person who was or is, or is threatened to be made, a party to any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative or investigative by reason of the fact that the person is or was our director, officer, employee or agent, or is or was serving at our request as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise.

Our amended and restated bylaws which will become effective in connection with the effectiveness of the registration statement of which this prospectus forms a part, will further authorize us to purchase and maintain insurance on behalf of any person who is or was our director, officer, employee or agent, or is or was serving at our request as a director, officer, employee or agent of another corporation, partnership, joint venture, trust, enterprise or nonprofit entity against any liability asserted against such person and incurred by such person in any such capacity, or arising out of such person's status as such, whether or not we would have the power to indemnify such person against such liability under the provisions of the DGCL.

We plan to purchase an insurance policy covering our officers and directors with respect to certain liabilities, including liabilities arising under the Securities Act, or otherwise. In addition, in connection with the effectiveness of the registration statement of which this prospectus forms a part, we intend to enter into separate indemnification agreements with each of our directors and executive officers.

#### **Item 15. Recent Sales of Unregistered Securities**

The following sets forth information regarding all unregistered securities we have issued since our inception.

##### **Series A Preferred Stock**

In connection with our formation, on April 8, 2021, we issued the equivalent of 8,750,000 shares of our Series A Preferred Stock to FibroGenesis in return for rights to certain intellectual property through the Patent Assignment Agreement and the Intellectual Property Cross-License Agreement. See "*Business—Intellectual Property*" for additional details. No underwriters were involved in the sale of the securities. The sale of the securities were deemed to be exempt from registration pursuant to Section 4(a)(2) of the Securities Act, including Regulation D and Rule 506 promulgated thereunder, as transactions by an issuer not involving a public offering.

##### **Non-Voting Common Stock**

In January 2022, we issued an aggregate of the equivalent of 37,500 shares of our non-voting common stock for no cash consideration to five of our independent directors, the equivalent of 7,500 shares each, for their service on our board of directors. The issuance of the securities was deemed to be exempt from registration pursuant to Section 4(a)(2) of the Securities Act, including Regulation D and Rule 506 promulgated thereunder, as transactions by an issuer not involving a public offering.

In March 2022, we issued the equivalent of 12,500 shares and 1,250 shares, respectively, of our non-voting common stock for no cash consideration to Dr. An and Dr. Khoja for services provided. The issuance of the securities was deemed to be exempt from registration pursuant to Section 4(a)(2) of the Securities Act, including Regulation D and Rule 506 promulgated thereunder, as transactions by an issuer not involving a public offering.

In August 2022, we issued the equivalent of 28,179,592 of our nonvoting common stock to our parent company, FibroGenesis. The sale of the securities was deemed to be exempt from registration pursuant to Section 4(a)(2) of the Securities Act, including Regulation D and Rule 506 promulgated thereunder, as transactions by an issuer not involving a public offering.

##### **Series B Preferred Stock**

In December 2022, we issued an aggregate of the equivalent of 381,658 shares of Series B Preferred Stock to investors in a private placement, at a price the equivalent of \$6.76 with respect to the equivalent of 318,049 shares, with the remaining equivalent of 63,609 shares being bonus shares. The sales of the securities were deemed to be exempt from registration pursuant to Section 4(a)(2) of the Securities Act, including Regulation D and Rule 506 promulgated thereunder, as transactions by an issuer not involving a public offering.

From February 2023 through April 2023, we issued an aggregate of the equivalent of 890,310 shares of our Series B Preferred Stock to investors in a Regulation Crowdfunding offering, at a price the equivalent of \$6.76 as to the equivalent of 724,937 shares, with the remaining equivalent of 143,225 shares and equivalent of 22,148 shares being bonus and commission shares, respectively. The sales of the foregoing securities were issued pursuant to the exemption provided by Section 4(a)(6) of the Securities Act.

In March and April 2023, we issued an aggregate of the equivalent of 1,680,084 shares of our Series B Preferred Stock to investors in private placements, at a price the equivalent of \$6.76 as to the equivalent of 1,527,349 shares, with the remaining equivalent of 152,735 shares being bonus shares. The sales of the securities were deemed to be exempt from registration pursuant to Section 4(a)(2) of the Securities Act, including Regulation D and Rule 506 promulgated thereunder, as transactions by an issuer not involving a public offering.

##### **Series B-1 Preferred Stock**

From April 2023 through September 2023, we issued an aggregate of the equivalent of 74,922 shares of our Series B-1 Preferred Stock to investors in a private placement, at prices ranging from the equivalent of \$18.00 to \$20.00 per share as to the equivalent of 64,070 shares, with the remaining equivalent of 10,852 shares being bonus shares. In connection with a portion of such private placement of our Series B-1 Preferred Stock, we also agreed to issue warrants, exercisable for a period of three years from their

issuance date, to purchase an aggregate of the equivalent of an aggregate of 8,890 shares of our common stock at an exercise price of the equivalent of \$20.00 per share. The sales of the securities were deemed to be exempt from registration pursuant to Section 4(a)(2) of the Securities Act, including Regulation D and Rule 506 promulgated thereunder, as transactions by an issuer not involving a public offering. In November 2023, the Company issued a total of 14,859 additional shares of Series B-1 Preferred Stock and 1,431 additional warrants to purchase shares of common stock to investors who subscribed to purchase shares of Series B-1 Preferred Stock at a price per share that exceeded the reference price per share expected in the Direct Listing.

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

***Exhibits***

See the Exhibit Index immediately preceding the signature page hereto for a list of exhibits filed as part of this registration statement, which Exhibit Index is incorporated herein by reference.

***Financial Statement Schedules***

All financial statement schedules are omitted because the information called for is not required or is shown either in the financial statements or in the accompanying notes.

**Item 17. 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;

(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.

(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), (ii), and (iii) 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 SEC by the registrant pursuant to Section 13 or Section 15(d) of the Exchange Act, that are incorporated by reference in the registration statement.

(2) That, for the purpose of determining any liability under the Securities Act, 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.

(4) That, for the purpose of determining liability under the Securities Act to any purchaser, each prospectus filed pursuant to Rule 424(b) as part of a registration statement relating to an offering, other than registration statements relying on Rule 430B or other than prospectuses filed in reliance on Rule 430A, shall be deemed to be part of and included in the registration statement as of the date it is first used after effectiveness. Provided, however, that no statement made in a registration statement or prospectus that is part of the registration statement or made in a document incorporated or deemed incorporated by reference into the registration statement or prospectus that is part of the registration statement will, as to a purchaser with a time of contract of sale prior to such first use, supersede or modify any statement that was made in the registration statement or prospectus that was part of the registration statement or made in any such document immediately prior to such date of first use.

(5) That, for the purpose of determining liability of the registrant under the Securities Act to any purchaser in the initial distribution of the securities, the undersigned registrant undertakes that in a primary offering of securities of the undersigned registrant pursuant to this registration statement, regardless of the underwriting method used to sell the securities to the purchaser, if the securities are offered or sold to such purchaser by means of any of the following communications, the undersigned registrant will be a seller to the purchaser and will be considered to offer or sell such securities to such purchaser:

(i) Any preliminary prospectus or prospectus of the undersigned registrant relating to the offering required to be filed pursuant to Rule 424;

(ii) Any free writing prospectus relating to the offering prepared by or on behalf of the undersigned registrant or used or referred to by the undersigned registrant;

(iii) The portion of any other free writing prospectus relating to the offering containing material information about the undersigned registrant or its securities provided by or on behalf of the undersigned registrant; and

(iv) Any other communication that is an offer in the offering made by the undersigned registrant to the purchaser.

(b) Insofar as indemnification for liabilities arising under the Securities Act 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 SEC such indemnification is against public policy as expressed in the Securities Act 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 and will be governed by the final adjudication of such issue.

(c) For purposes of determining any liability under the Securities Act, the information omitted from the form of prospectus filed as part of this registration statement in reliance upon Rule 430A and contained in a form of prospectus filed by the registrant pursuant to Rule 424(b)(1) or (4) or 497(h) under the Securities Act shall be deemed to be part of this registration statement as of the time it was declared effective.

(d) For the purpose of determining any liability under the Securities Act, each post-effective amendment that contains a form of prospectus 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.

## EXHIBIT INDEX

### Exhibit No.

- 3.1\* [Amended and Restated Certificate of Incorporation of the registrant, as currently in effect.](#)
- 3.2\* [Bylaws of the registrant, as currently in effect.](#)
- 4.1\* Reference is made to exhibits [3.1](#) through [3.2](#).
- 5.1 [Opinion of Norton Rose Fulbright US LLP.](#)
- 10.1\* [Intellectual Property Cross-License Agreement dated as of May 17, 2021, between SpinalCyte LLC and FibroBiologics, LLC.](#)
- 10.2\* [Patent Assignment Agreement dated May 17, 2021, between SpinalCyte LLC and FibroBiologics, LLC.](#)
- 10.3\* [Share Purchase Agreement dated as of November 12, 2021, by and among FibroBiologics, LLC GEM Global Yield LLC SCS and GEM Yield Bahamas Limited.](#)
- 10.4\* [Registration Rights Agreement dated November 12, 2021, by and among FibroBiologics, LLC GEM Global Yield LLC SCS and GEM Yield Bahamas Limited.](#)
- 10.5\* [Bridge Note dated April 1, 2021, between SpinalCyte LLC and FibroBiologics, Inc.](#)
- 10.6\* [Sublease Agreement between United Fire & Casualty Company and FibroBiologics, Inc., effective October 5, 2022.](#)
- 10.7\* [License Agreement, dated November 30, 2021, between K2 Biolabs, LLC and FibroBiologics, LLC.](#)
- 10.8\* [Amendment No. 1, effective July 1, 2022, to the License Agreement between K2 Biolabs, LLC and FibroBiologics, Inc.](#)
- 10.9\* [Amendment No. 2, effective August 1, 2022, to the License Agreement between K2 Biolabs, LLC and FibroBiologics, Inc.](#)
- 10.10\* [Amendment No. 3, effective October 1, 2022, to the License Agreement between K2 Biolabs, LLC and FibroBiologics, Inc.](#)
- 10.11\* [Amendment No. 4, effective January 1, 2023, to the License Agreement between K2 Biolabs, LLC and FibroBiologics, Inc.](#)
- 10.12\* [2022 Stock Plan](#)
- 10.13\* [Employment Agreement effective from July 20, 2021, between FibroBiologics, LLC and Hamid Khoja.](#)
- 10.14\* [Employment Agreement effective from May 31, 2022, between FibroBiologics, Inc. and Mark Andersen.](#)
- 10.15\* [Form of Indemnification Agreement between the Registrant and each of its Directors and Executive Officers.](#)
- 10.16\* [Energy Research Park Industrial Lease between University of Houston System, as Landlord, and FibroBiologics, Inc., as Tenant, effective August 1, 2023.](#)
- 10.17\* [IP Transfer Agreement between SpinalCyte, LLC and FibroBiologics, LLC, dated as of May 17, 2021.](#)
- 10.18\* [Amendment 1 to the Patent Assignment Agreement, effective August 2, 2022.](#)
- 10.19\* [Agreement Regarding Right of First Negotiation dated January 20, 2023.](#)
- 10.20\* [Form of Stock Option Notice and Grant Agreement.](#)
- 10.21\* [Amendment 1 to Energy Research Park Industrial Lease between University of Houston System, as Landlord, and FibroBiologics, Inc., as Tenant, effective October 1, 2023.](#)
- 10.22\* [Employment Agreement effective from December 1, 2023, between FibroBiologics, Inc. and Pete O’Heeron.](#)
- 23.1 [Consent of Norton Rose Fulbright US LLP \(included in Exhibit 5.1\).](#)
- 23.2 [Consent of WithumSmith+Brown PC.](#)
- 23.3\* [Consent of Howard An, M.D.](#)
- 24.1\* [Power of Attorney \(included in the signature page to this registration statement\).](#)
- 107\* [Filing Fee Table](#)

\* Previously filed.

**SIGNATURES**

Pursuant to the requirements of the Securities Act of 1933, the registrant has duly caused this registration statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the city of Houston, State of Texas, on December 7, 2023.

**FibroBiologics, Inc.**

By: /s/ Pete O'Heeron  
Pete O'Heeron  
Chief Executive Officer

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.

<u>Signature</u>	<u>Title</u>	<u>Date</u>
<u>/s/ Pete O'Heeron</u> Pete O'Heeron	Chairperson and Chief Executive Officer (Principal Executive Officer)	December 7, 2023
<u>/s/ Mark Andersen</u> Mark Andersen	Chief Financial Officer (Principal Financial Officer and Principal Accounting Officer)	December 7, 2023
<u>*</u> Robert Hoffman	Director	December 7, 2023
<u>*</u> Victoria Niklas, M.D.	Director	December 7, 2023
<u>*</u> Richard Cilento	Director	December 7, 2023
<u>*</u> Stacy Coen	Director	December 7, 2023
<u>*</u> Matthew Link	Director	December 7, 2023

\*By: /s/ Mark Andersen  
Name: Mark Andersen  
Title: Attorney-in-fact



December 7, 2023

FibroBiologics Inc.  
455 E. Medical Center Blvd.  
Suite 300  
Houston, Texas 77598

Norton Rose Fulbright US LLP  
1301 McKinney, Suite 5100  
Houston, Texas 77010-3095  
United States

Tel +1 713 651 5151  
Fax +1 713 651 5246  
nortonrosefulbright.com

**Re: Registration Statement of FibroBiologics Inc. on Form S-1**

Dear Sirs:

We have acted as counsel to FibroBiologics Inc. (the **Company**), a Delaware corporation, in connection with its filing of a registration statement on Form S-1 (the **Registration Statement**) filed by the Company under the Securities Act of 1933, as amended (the **Securities Act**), relating to the offer and resale of up to an aggregate of 4,806,226 shares of common stock of the Company (the **Shares**). We have been requested by the Company to render this opinion in connection with the filing of the Registration Statement.

As counsel, we have made such investigations and examined the originals, or duplicate, certified, conformed, telecopied or photostatic copies of such corporate records, agreements, documents and other instruments and have made such other investigations as we have considered necessary or relevant for the purposes of this opinion, including:

- (a) the Registration Statement;
- (b) the Amended & Restated Certificate of Incorporation and Bylaws of the Company; and
- (c) a Certificate of Good Standing dated November 3, 2023 issued by the Secretary of State of Delaware.

With respect to the accuracy of factual matters material to this opinion, we have relied upon certificates or comparable documents and representations of public officials and of officers of the Company and have not performed any independent check or verification of such factual matters.

In giving this opinion, we have assumed the genuineness of all signatures, the legal capacity of natural persons, the authenticity of all documents submitted to us as originals, the conformity to authentic original documents of all documents submitted to us as duplicates, certified, conformed, telecopied or photostatic copies and the authenticity of the originals of such latter documents, and that all facts set forth in the certificates supplied by officers of the Company are complete, true and accurate as of the date hereof.

The opinion set forth below is limited to the laws of the State of Delaware and the federal laws of United States applicable therein, in each case in effect on the date hereof. Our opinion is rendered as of the date hereof, and we assume no obligation to advise you of changes in law or fact (or the effect thereof on the opinions expressed herein) that hereafter may come to our attention.

Norton Rose Fulbright US LLP is a limited liability partnership registered under the laws of Texas.

Norton Rose Fulbright US LLP, Norton Rose Fulbright LLP, Norton Rose Fulbright Australia, Norton Rose Fulbright Canada LLP and Norton Rose Fulbright South Africa Inc are separate legal entities and all of them are members of Norton Rose Fulbright Verein, a Swiss verein. Norton Rose Fulbright Verein helps coordinate the activities of the members but does not itself provide legal services to clients. Details of each entity, with certain regulatory information, are available at [nortonrosefulbright.com](http://nortonrosefulbright.com).

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December 7, 2023

Page 2

The opinion set forth below is subject to the following exceptions, limitations and qualifications: (i) the effect of bankruptcy, insolvency, reorganization, arrangement, moratorium, fraudulent conveyance, fraudulent transfer and other similar laws relating to or affecting the rights of creditors; (ii) the effect of general principles of equity (including, without limitation, concepts of materiality, reasonableness, good faith and fair dealing and the possible unavailability of specific performance, injunctive relief and other equitable remedies), regardless of whether considered in a proceeding at law or in equity, (iii) the effect of public policy considerations that may limit the rights of the parties to obtain further remedies, (iv) we express no opinion with respect to the enforceability of provisions relating to choice of law, choice of venue, jurisdiction or waivers of jury trial, and (v) we express no opinion with respect to the enforceability of any waiver of any usury defense.

Based on the foregoing, and subject to the assumptions, limitations and qualifications set forth herein, including the assumption that the Registration Statement and any required post-effective amendment(s) thereto required by applicable laws have become effective under the Securities Act, we are of the opinion that the Shares have been authorized and validly issued and are fully paid and non-assessable.

We hereby consent to the filing of this opinion with the Commission as an exhibit to the Registration Statement and to the use of our name therein. In giving such consent, we do not thereby admit that we are in the category of persons whose consent is required under Section 7 of the Securities Act or the Rules and Regulations of the Commission promulgated thereunder.

Very truly yours,

/s/ Norton Rose Fulbright US LLP

Norton Rose Fulbright US LLP

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**CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM**

We hereby consent to the use in the Prospectus constituting a part of this Registration Statement Amendment No. 4 to Form S-1 of our report dated April 28, 2023, except for the effects of the reverse stock split described in Note 13, as to which the date is November 7, 2023, relating to the financial statements of FibroBiologics, Inc. as of and for the years ended December 31, 2022 and 2021, which is included in that Prospectus. We also consent to the reference to our firm under the caption “Experts” in the Prospectus.

/s/ WithumSmith+Brown, PC

East Brunswick, New Jersey  
December 7, 2023

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