

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

FORM S-1

REGISTRATION STATEMENT
UNDER
THE SECURITIES ACT OF 1933

FibroBiologics, Inc.

(Exact name of registrant as specified in its charter)

Delaware	2834	86-3329066
(State or other jurisdiction of incorporation or organization)	(Primary Standard Industrial Classification Code Number)	(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)

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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
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.

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.

The information in this preliminary prospectus is not complete and may be changed. These securities may not be sold until the registration statement filed with the Securities and Exchange Commission is effective. This preliminary prospectus is not an offer to sell these securities and it is not soliciting an offer to buy these securities in any jurisdiction where the offer or sale is not permitted.



FibroBiologics, Inc.

41,289,033 Shares of Common Stock

This prospectus relates to the registration of the resale or other disposition of up to 41,289,033 shares of our common stock by YA II PN, LTD, or Yorkville. Yorkville is also referred to in this prospectus as the Selling Stockholder. The shares of our common stock to which this prospectus relates have been or may be issued by us to Yorkville pursuant to a standby equity purchase agreement, dated as of December 20, 2024, by and between us and Yorkville, or the SEPA. Such shares of common stock include (i) up to 36,945,813 shares of common stock that may be issued to Yorkville pursuant to promissory notes that have been or may be issued by us to Yorkville pursuant to the SEPA, (ii) 105,932 shares of common stock we will issue to Yorkville as partial consideration for its commitment to purchase shares of our common stock pursuant to the SEPA, and (iii) up to 4,237,288 shares of common stock that may be issued to Yorkville pursuant to the SEPA, either in our sole discretion following an Advance Notice (as defined below) or pursuant to an Investor Notice (as defined below).

We are not selling any securities under this prospectus and will not receive any of the proceeds from the sale of our common stock by the Selling Stockholder. However, we may receive up to \$25,000,000 aggregate gross proceeds from sales of common stock we may elect to make to Yorkville pursuant to the SEPA prior to or after the date of this prospectus. See "The Standby Equity Purchase Agreement" on page 6 of this prospectus for a description of the SEPA and "Principal and Selling Stockholders" on page 17 of this prospectus for additional information regarding the Selling Stockholder.

The Selling Stockholder may sell or otherwise dispose of the common stock described in this prospectus in a number of different ways and at varying prices. The Selling Stockholder is an "underwriter" within the meaning of Section 2(a)(11) of the Securities Act of 1933, as amended, or the Securities Act, only with respect to advances under the SEPA and any profits on the sales of shares of our common stock by the Selling Stockholder and any discounts, commissions, or concessions received by the Selling Stockholder are deemed to be underwriting discounts and commissions under the Securities Act. If any underwriters, dealers, or agents are involved in the sale of any of the securities, their names and any applicable purchase price, fee, commission, or discount arrangement between or among them will be set forth, or will be calculable from the information set forth, in any applicable prospectus supplement. Yorkville is not an "underwriter" within the meaning of Section 2(a)(11) of the Securities Act with respect to conversion of the Promissory Notes. We will pay the expenses incurred in registering under the Securities Act the offer and sale of the shares of the common stock to which this prospectus relates by the Selling Stockholder, including our legal and accounting fees. See the sections "About this Prospectus" on page 1 and "Plan of Distribution" on page 27 of this prospectus for more information. No securities may be sold without delivery of this prospectus and any applicable prospectus supplement describing the method and terms of the offering of such securities. You should carefully read this prospectus and any applicable prospectus supplement before you invest in our securities.

We engaged D. Boral Capital LLC, or DBC, to act as our placement agent in connection with the SEPA. We have agreed to pay DBC a cash fee of 6.5% based upon the aggregate gross proceeds received from the sales of common stock that we elect to make to the Selling Stockholder pursuant to the SEPA. See "Plan of Distribution" on page 27 of this prospectus for additional information regarding this arrangement.

We will pay the expenses of registering these shares, but all selling and other expenses incurred by the Selling Stockholder will be paid by it.

Our common stock is listed on the Nasdaq Global Market under the symbol "FBLG". On December 27, 2024, the last reported sales price of our common stock was \$2.36 per share.

Our founder and Chief Executive Officer, Pete O'Heeron, beneficially owns approximately 57% of the voting power of our outstanding voting securities, and we are a "controlled company" within the meaning of the listing rules of The Nasdaq Stock Market LLC. We do not intend to rely on any exemptions from the corporate governance requirements that are available to controlled companies.

We are an "emerging growth company" and a "smaller reporting company" as defined under the federal securities laws and, as such, have elected to comply with certain reduced public company reporting requirements for this prospectus and may elect to do so in future filings. See "Prospectus Summary—Implications of Being an Emerging Growth Company and a Smaller Reporting Company."

Investing in our common stock involves a high degree of risk. See the "Risk Factors" section beginning on page 12 of this prospectus for the risks and uncertainties you should consider before investing in our common stock.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or determined if this prospectus is truthful or complete. Any representation to the contrary is a criminal offense.

Prospectus Dated , 2024

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You should rely only on the information contained in this prospectus or contained in any free writing prospectus filed with the Securities and Exchange Commission. Neither we nor Yorkville have authorized anyone to provide any information different from, or in addition to, the information contained in this prospectus and in any free writing prospectuses we have prepared or that have been prepared on our behalf or to which we have referred you. Neither we nor Yorkville take responsibility for, and can provide no assurance as to the reliability of, any other information that others may give you. Yorkville is offering to sell, and seeking offers to buy, shares of our common stock only under the circumstances and in jurisdictions where it is lawful to do so. The information contained in this prospectus is current only as of its date, regardless of the time of delivery of this prospectus or of any sale of our common stock. Our business, financial condition, results of operations and prospects may have changed since such date.

For investors outside the United States: Neither we nor Yorkville have done anything that would permit the use of or possession or distribution of this prospectus or any related free writing prospectus in any jurisdiction where action for that purpose is required, other than in the United States. Persons outside the United States who come into possession of this prospectus must inform themselves about, and observe any restrictions relating to, the offering of the shares of our common stock by Yorkville and the distribution of this prospectus outside the United States.

ABOUT THIS PROSPECTUS

This prospectus is a part of a registration statement on Form S-1 that we filed with the Securities and Exchange Commission, or the SEC, using a "shelf" registration or continuous offering process. Under this process, the Selling Stockholder may, from time to time, sell the common stock covered by this prospectus in the manner described in the section titled "Plan of Distribution." Additionally, we may provide a prospectus supplement to add information to, or update or change information contained in, this prospectus, including the section titled "Plan of Distribution." You may obtain this information without charge by following the instructions under the "Where You Can Find Additional Information" section of this prospectus. You should read this prospectus and any prospectus supplement before deciding to invest in our common stock.

This prospectus contains summaries of certain provisions contained in some of the documents described herein, but reference is made to the actual documents for complete information. All of the summaries are qualified in their entirety by the actual documents. Copies of some of the documents referred to herein have been filed or will be filed as exhibits to the registration statement of which this prospectus is a part, and you may obtain copies of those documents as described under "Where You Can Find Additional Information."

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PROSPECTUS SUMMARY

This summary highlights select information contained elsewhere in this prospectus and does not contain all the information you should consider before making an investment decision. You should read the entire prospectus carefully, including the sections entitled "Risk Factors," "Cautionary Note Regarding Forward-Looking Statements," "Management's Discussion and Analysis of Financial Condition and Results of Operations" and our financial statements and the accompanying notes included elsewhere in, or incorporated by reference into, this prospectus before making an investment decision. Unless otherwise indicated or the context otherwise requires, all references in this prospectus to "we," "us," "our," the "Company," "FibroBiologics" and similar terms refer to FibroBiologics, Inc.

Overview

We are a clinical-stage biotechnology company focused on developing and commercializing fibroblast-based therapies for patients suffering from chronic diseases with significant unmet medical needs, including wound healing, multiple sclerosis (MS), degenerative disc disease, psoriasis and certain cancers, and potential human longevity applications including thymic involution reversal. At present, our novel manufacturing process entails collecting excess tissue from surgical procedures and using the allogeneic fibroblasts to grow a cell bank for use in our procedures. Our most advanced product candidates are CYWC628, CYMS101 and CybroCell™.

We were formed in April 2021 as a Texas limited liability company under the name FibroBiologics, LLC, and converted to a Delaware corporation in December 2021 under the name FibroBiologics, Inc. On April 12, 2023, we changed our name to FibroBiologics, Inc. In connection with our formation, we issued shares of our Series A Preferred Stock, or the Series A Preferred Stock, to our then parent, SpinalCyte LLC (doing business as FibroGenesis), or FibroGenesis, in return for rights to certain intellectual property through a patent assignment agreement and an intellectual property cross-licensing agreement. Developing the intellectual property obtained from FibroGenesis was the basis for our formation. Prior to our inception, preclinical research and development related to the transferred intellectual property took place under FibroGenesis.

Fibroblasts Technology Platform

Fibroblasts and stem cells are the only two cell types in the human body that can regenerate tissue and organs. Studies have indicated that mesenchymal stem cells and fibroblasts share many surface markers in common, and can differentiate into many cells including adipocytes, chondrocytes, osteoblasts, hepatocytes, and cardiomyocytes, and can regulate the immune system. However, transcriptomic and epigenetic studies have indicated a clear difference between the two cell types.

Fibroblasts comprise the main cell type of connective tissue, possessing a spindle-shaped morphology, whose classical function has historically been believed to produce an extracellular matrix responsible for maintaining the structural integrity of the tissue. Fibroblasts also play an important role in maintaining stem cell niches in organs and are involved in every stage of wound healing.

Fibroblasts are favorable to stem cells as a cell therapy treatment platform because fibroblasts:

- can be non-invasively harvested from a variety of skin donors from surgical procedures such as tummy tuck flaps or simple biopsy punch;
- have a faster doubling time in culture than stem cells;
- possess superior immune modulatory activity compared with stem cells;
- exhibit enhanced ability to produce regenerative cytokines and growth factors compared with stem cells; and
- are more economical to isolate, culture and expand compared with stem cells because fibroblasts do not require the use of expensive tissue culture media and additives.

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Studies have demonstrated that allogeneic fibroblasts, much like mesenchymal stem cells, are immune-privileged and do not provoke an immune response *in vitro* and *in vivo*. If autologous fibroblasts were required instead, it would mean that cells would have to be harvested from each patient, processed and cultured, and then administered to the same patient, which would be more costly and inefficient. Because allogeneic fibroblasts do not cause an immune response, we are planning to build our own current Good Manufacturing Practices, or cGMP, manufacturing facility to source allogeneic fibroblast cells for clinical testing of our product candidates and for commercial sales if our product candidates receive marketing approval.

To date, however, no fibroblast therapy products have been approved and there have only been a few clinical trials involving fibroblasts. The costs to develop, manufacture, and commercialize product candidates utilizing our fibroblasts technology platform may exceed our estimates. Furthermore, the biotechnology and pharmaceutical industries are characterized by rapidly advancing technologies, intense competition and a strong emphasis on proprietary and novel products and product candidates so any product candidates that we successfully develop and commercialize will compete with existing therapies and new therapies that may become available in the future. Additional information regarding risks and uncertainties relating to our product candidates, technology and business are set forth in the sections titled "—Summary of Risk Factors" and "Risk Factors" in this prospectus.

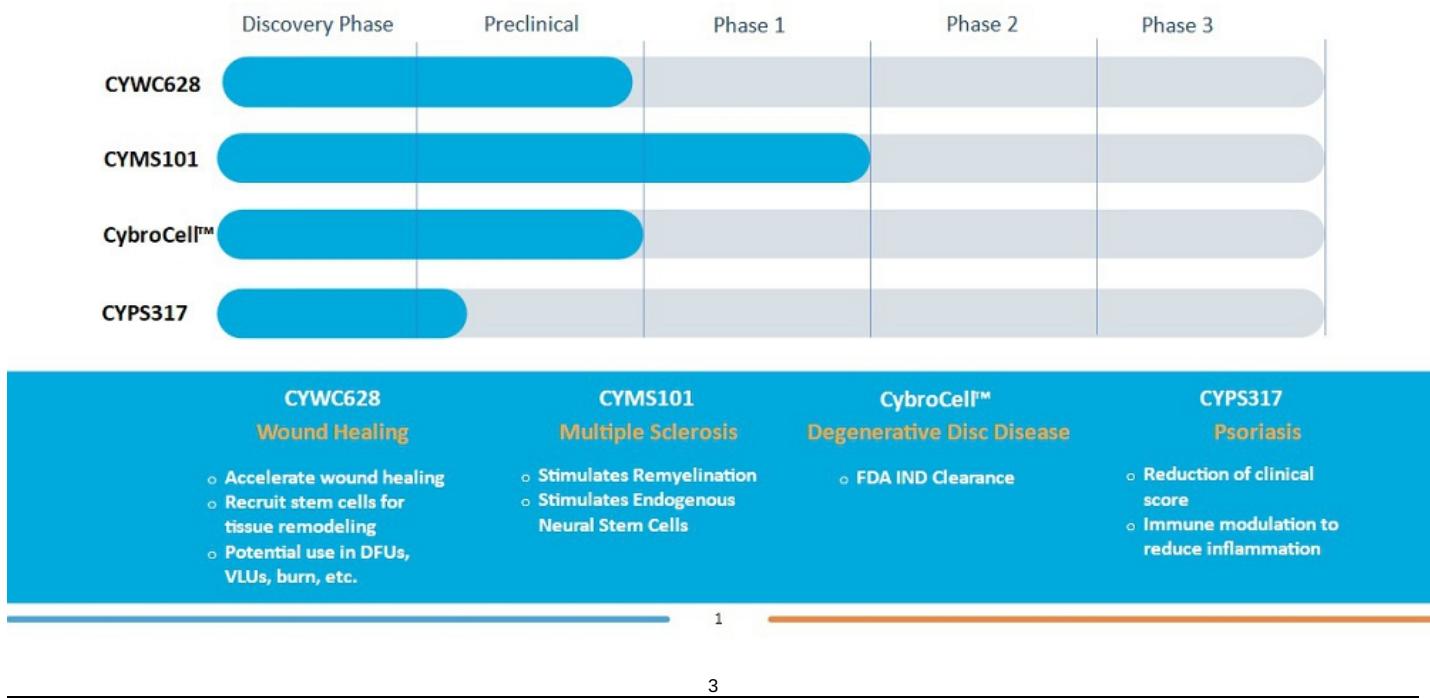
Our Management Team and Oversight

We have assembled an executive leadership team comprised of our founder, chief executive officer and chairperson of our board of directors, our chief scientific officer, our interim chief financial officer, and our general counsel, with combined successful track records in startup entrepreneurial companies and in the life sciences industry. Our executive leadership team works under the oversight of our board of directors who are recognized leaders with hands-on industry experience. We also have a team of world-renowned scientists with relevant expertise on our scientific advisory board to help guide our research and development efforts.

Our Current Pipeline

We have a pipeline of product candidates at various stages of development, including the following:

Our Product Candidate Pipeline



Our Competitive Strengths

Our strengths lie in our technology platform centered around the power of fibroblasts and in our experienced leadership team. Fibroblasts are the most common cell found in the human body and we believe they are more robust and potent than stem cells. Our intellectual property portfolio includes 160+ patents issued/pending for the use of fibroblasts in diverse therapeutic areas. We also have an experienced leadership team with successful track records in entrepreneurial startup companies and the life sciences industry, a board of directors with life sciences operational leadership experience, and a world-renowned scientific advisory board with relevant expertise.

Our Strategy

We are leveraging fibroblast cells as a technology platform to research and develop innovative treatments for chronic diseases with significant unmet treatment needs. Our vision is to become a world leader in regenerative medicine through a rigorous scientific process and commitment to serving patients' needs. To achieve our vision, we will focus our efforts on the following strategy:

- Prioritize our initial clinical development efforts on product candidates with the combination of significant unmet treatment needs, lower risk and high market potential.
- Partner with contract research organizations, or CROs, with the relevant expertise and experience to successfully and timely execute clinical trials to generate reliable pivotal data that can be used to seek approvals.
- Attract and retain scientists with the skill sets required to conduct preclinical studies and identify the optimal paths forward to clinical trials.
- Invest in critical capabilities required to produce and supply fibroblasts for clinical trials and initial commercialization.
- Protect, expand and defend our intellectual property portfolio around fibroblasts.
- Expand development efforts in product candidates with longer development timelines, greater risk and significant unmet treatment needs as funding allows.

Summary of Risk Factors

Our business is subject to numerous risks and uncertainties that you should be aware of before making an investment decision, including those highlighted and incorporated by reference in the section entitled "Risk Factors" in this prospectus. These risks include, but are not limited to, the following:

- There is substantial doubt about our ability to continue as a going concern.
- The successful development of biopharmaceutical products is highly uncertain.
- We have a limited operating history and none of our current product candidates have been approved for commercial sale.
- We have incurred significant net losses since inception, expect to continue to incur significant net losses for the foreseeable future and may never achieve or maintain profitability.
- We will require substantial additional capital to finance our operations. If we are unable to raise such capital when needed, or on acceptable terms, we may be forced to delay, reduce and/or eliminate one or more of our research and drug development programs or future commercialization efforts.
- The regulatory approval processes of the FDA, the European Medicines Agency, or the EMA, and other comparable foreign regulatory authorities are lengthy, time consuming and inherently unpredictable.

- We may encounter substantial delays in completing, or ultimately be unable to complete, the development and commercialization of our product candidates.
- The outcome of preclinical studies or early clinical trials may not be predictive of the success of later clinical trials, and the results of our clinical trials may not satisfy the requirements of the FDA, the EMA or other comparable foreign regulatory authorities.

- Interim, topline and preliminary data from our clinical trials that we announce or publish from time to time may change as more patient data become available and are subject to audit and verification procedures that could result in material changes in the final data.
- Our current or future product candidates may cause adverse events, toxicities or other undesirable side effects when used alone or in combination with other approved products or investigational new drugs that may result in a safety profile that could inhibit regulatory approval, prevent market acceptance, limit their commercial potential or result in significant negative consequences.
- Even if approved, our product candidates may not achieve adequate market acceptance.
- Our refrigerated product candidates require specific storage, handling and administration at the clinical sites.
- We intend to identify and develop novel cell therapy product candidates, which makes it difficult to predict the time, cost and potential success of product candidate development.
- Because cell therapy is novel and the regulatory landscape that governs any cell therapy product candidates we may develop is rigorous, complex, uncertain and subject to change, we cannot predict the time and cost of obtaining regulatory approval, if we receive it at all, for any product candidates we may develop.
- We may be unable to obtain U.S. or foreign regulatory approvals and, as a result, may be unable to commercialize our product candidates.
- Any product candidates for which we intend to seek approval as biologic products may face competition sooner than anticipated.
- We have limited experience in designing clinical trials.
- Our long-term prospects depend in part upon discovering, developing and commercializing additional product candidates, which may fail in development or suffer delays that adversely affect their commercial viability.
- We have never commercialized a fibroblast cell-based therapy product candidate before and may lack the necessary expertise, personnel and resources to successfully commercialize any product candidates on our own or together with suitable collaborators.
- We face significant competition.
- If we are unable to establish sales or marketing capabilities or enter into agreements with third parties to sell or market our product candidates, we may not be able to successfully sell or market our product candidates that obtain regulatory approval.
- In order to successfully implement our plans and strategies, we will need to grow the size of our organization, and we may experience difficulties in managing this growth.
- We are subject to risks related to our dependence on third parties (i) to conduct certain aspects of our preclinical studies and clinical trials and (ii) for certain portions of our manufacturing process.

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- We are highly dependent on our Houston, Texas facility and any failure to maintain the use of this facility would have a material and adverse effect on our business.
- We are subject to extensive government regulations.
- Our business entails a significant risk of product liability.
- The FDA, the EMA and other comparable foreign regulatory authorities may not accept data from trials conducted in locations outside of their jurisdiction.
- Even if our product candidates receive regulatory approval, they will be subject to significant post-marketing regulatory requirements and oversight.
- Our success depends on our ability to protect our intellectual property and our proprietary technologies, and we are subject to various risks relating to our intellectual property.
- We may not be able to continue to meet Nasdaq's continued listing requirements.
- The requirements of being a public company may strain our resources, divert management's attention and affect our ability to attract and retain executive management and qualified board members.
- We are a "controlled company" within the meaning of The Nasdaq Stock Market Rules because our insiders beneficially own more than 50% of the voting power of our outstanding voting securities.
- We have 2,500 shares of Series C Preferred Stock with super voting rights.
- We have identified a material weakness in our internal controls over financial reporting due to lack of segregation of duties.
- Our shares of common stock have a very short trading history on Nasdaq. An active trading market may not develop or continue to be liquid and the market price of our shares of common stock may be volatile.

The Standby Equity Purchase Agreement

On December 20, 2024, or the Effective Date, we entered into a Standby Equity Purchase Agreement, or the SEPA, with YA II PN, LTD., a Cayman Islands exempt limited company, or Yorkville or the Selling Stockholder.

Pursuant to the SEPA, Yorkville will advance us, subject to the satisfaction of certain conditions as set forth therein, the principal amount of \$15 million, or the Pre-Paid Advance, which will be evidenced by convertible promissory notes, or the Promissory Notes, in three tranches. The Promissory Notes will accrue interest on the outstanding principal balance at an annual rate equal to 0%, which will increase to an annual rate of 18% upon the occurrence of an event of default (as defined in the Promissory Notes) for so long as such event remains uncured. The Promissory Notes will mature on December 20, 2025, which may be extended at our election to January 19, 2026 by paying an extension fee of \$100,000, and subsequently to February 18, 2026 by paying an additional extension fee of \$100,000. The maturity date may also be extended at the option of the Selling Stockholder.

The Promissory Notes are convertible at a conversion price equal to the lower of (i) \$2.41 per share or (ii) 94% of the lowest daily VWAP during the five consecutive trading days immediately preceding the conversion date (but no lower than the "floor price" then in effect, subject to adjustment from time to time in accordance with the terms contained in the Promissory Notes).

The first tranche of the Pre-Paid Advance was disbursed on December 20, 2024 in the principal amount of \$5 million. The second tranche of the Pre-Paid Advance will be in the principal amount of \$5 million and advanced on the second trading day after the filing of this registration statement, subject to the satisfaction of certain additional conditions. The third tranche of the Pre-Paid Advance will be in the principal amount of \$5 million and advanced on the second trading day after the later of (i) this registration statement first becoming effective and (ii) our receipt of shareholder approval to issue shares of our common stock in excess of the Exchange Cap (as defined in the SEPA), subject to the satisfaction of certain additional conditions.

At the closing of each tranche of the Pre-Paid Advance, the Selling Stockholder will advance to us the principal amount of the applicable tranche of the Pre-Paid Advance, less a discount in the amount equal to 6% of the principal amount of such tranche of the Pre-Paid Advance netted from the purchase price due and structured as an original issue discount.

Pursuant to the SEPA, and upon the satisfaction of the conditions to the Selling Stockholder's purchase obligation set forth therein, including the registration of shares of common stock issuable pursuant to the SEPA for resale, we will have the right, from time to time, until December 20, 2026, to require the Selling Stockholder to purchase up to an additional \$10 million of shares of common stock, or the Commitment Amount, subject to certain limitations and conditions set forth in the SEPA, by delivering written notice to the Selling Stockholder, or an Advance Notice.

If there is no balance outstanding under the Promissory Notes, we may, in our sole discretion, select the amount of the Advance that we desire to issue and sell to the Selling Stockholder in each Advance Notice, subject to a maximum limit equal to 100% of the average of the daily volume traded of our common stock on The Nasdaq Global Market for the five consecutive trading days immediately preceding the delivery of an Advance Notice, or the Maximum Advance Amount. If there is a balance outstanding under the Promissory Notes, we may only submit an Advance Notice (i) if an Amortization Event (as defined in the Promissory Notes) has occurred and our obligation to make prepayments under the Promissory Notes has not ceased, and (ii) the aggregate purchase price owed to us from such Advances, or the Advance Proceeds, will be paid by the Selling Stockholder by offsetting the amount of the Advance Proceeds against an equal amount outstanding under the Promissory Notes. Pursuant to an Advance Notice, the shares will be issued and sold to Yorkville at a per share price equal to, at our election as specified in the relevant Advance Notice: (i) 94% of the Market Price for any period commencing on the receipt of the Advance Notice by the Selling Stockholder (or, if the Advance Notice is submitted to the Selling Stockholder prior to 9:00 a.m. Eastern Time, the opening of trading on such day) and ending on 4:00 p.m. Eastern Time on the date of the applicable Advance Notice, or (ii) 96% of the Market Price for the three consecutive trading days commencing on the day such Advance Notice is delivered.

For so long as there is a balance outstanding under the Promissory Notes, Yorkville, at its sole discretion, may deliver to us a notice, or an Investor Notice, to cause an Advance Notice to be deemed delivered to the Selling Stockholder and the issuance of shares of common stock to the Selling Stockholder pursuant to an Advance. The Selling Stockholder may select the amount of the Advance pursuant to an Investor Notice which shall not exceed the limitations set forth in the SEPA, provided that the amount of the Advance selected will not exceed the balance owed under the Promissory Notes outstanding on the date of delivery of the Investor Notice. The shares will be issued and sold to the Selling Stockholder pursuant to an Investor Notice at a per share price equal to the Conversion Price that would be applicable to the amount of the Advance selected by the Selling Stockholder if such amount were to be converted under the applicable Promissory Note(s) as of the date of delivery of the Investor Notice. The Selling Stockholder will pay the purchase price for such shares to be issued pursuant to the Investor Notice by offsetting the amount of the purchase price to be paid by the Selling Stockholder against an amount outstanding under the Promissory Notes.

We paid the Selling Stockholder a structuring fee of \$25,000 and agreed to pay the Selling Stockholder a commitment fee totaling \$250,000, or the Commitment Fee. The Commitment Fee will be paid through the issuance of such number of shares of common stock to the Selling Stockholder on the 12th trading day following the Effective Date equal to the Commitment Fee divided by the average VWAP for the three trading days prior to the 10th trading day following the Effective Date.

Under the applicable rules of The Nasdaq Stock Market LLC, or the Nasdaq Rules, and pursuant to the SEPA, in no event may we issue or sell to the Selling Stockholder shares of common stock in excess of 7,013,635 shares, or the Exchange Cap, which is 19.99% of the shares of our common stock outstanding immediately prior to the Effective Date, unless we obtain stockholder approval to issue shares of common stock in excess of the Exchange Cap. In any event, we may not issue or sell any shares of common stock under the SEPA if such issuance or sale would breach any applicable Nasdaq Rules.

In addition, we may not issue or sell any shares of common stock to the Selling Stockholder under the SEPA or under the Promissory Notes, which, when aggregated with all other shares of common stock then beneficially owned by the Selling Stockholder and its affiliates (as calculated pursuant to Section 13(d) of the Securities Exchange Act of 1934, as amended, and Rule 13d-3 promulgated thereunder), would result in the Selling Stockholder and its affiliates beneficially owning more than 4.99% of the then-outstanding shares of our common stock.

The SEPA will automatically terminate on the earlier to occur of (i) December 20, 2026 or (ii) the date on which the Selling Stockholder has purchased from us under the SEPA the Commitment Amount in full. We may terminate the SEPA at any time upon five trading days' prior written notice to Yorkville, provided that there are no outstanding Advance Notices under which we are yet to issue common stock and provided that we have paid all amounts owed to the Selling Stockholder pursuant to the SEPA and the Promissory Notes. We and the Selling Stockholder may also agree to terminate the SEPA by mutual written consent. Neither we nor the Selling Stockholder may assign or transfer our respective rights and obligations under the SEPA, and no provision of the SEPA may be modified or waived by us or the Selling Stockholder other than by an instrument in writing signed by both parties.

The SEPA contains customary representations, warranties, conditions, and indemnification obligations of the parties. The representations, warranties, and covenants contained in the SEPA were made only for purposes of such agreement and as of specific dates, were solely for the benefit of the parties to such agreement and may be subject to limitations agreed upon by the parties. Copies of the agreements have been filed as exhibits to the registration statement that includes this prospectus and are available electronically on the SEC's website at www.sec.gov.

In connection with the SEPA, the Company entered into a registration rights agreement, or the SEPA Registration Rights Agreement, with the Selling Stockholder, pursuant to which we agreed to file a registration statement registering the resale of the common stock underlying the SEPA, the Promissory Notes and the Commitment Fee.

Other than as stated above, we will control the timing and amount of any sales of common stock to the Selling Stockholder that we may elect, in our sole discretion, to effect from time to time during the term of the SEPA. Actual sales of shares of common stock to the Selling Stockholder under the SEPA will depend on a variety of factors to be determined by us from time to time, including, among other things, market conditions, the trading price of the common stock and determinations by us as to the appropriate sources of funding for our business and our operations.

The net proceeds to us from sales that we elect to make to the Selling Stockholder under the SEPA, if any, will depend on the frequency and prices at which we sell shares of our common stock to the Selling Stockholder. We expect that any proceeds received by us from such sales to the Selling Stockholder will be used for general corporate purposes.

So long as any Promissory Note is outstanding, we will not be party to any variable rate transactions; provided, however, we can enter into an at-the-market facility with D. Boral Capital and provided, further, that at any time a Promissory Note is outstanding, any use of such facility is subject to the consent of the Selling Stockholder unless we have paid it to extend the Maturity Date and 100% of the proceeds from the use of such facility are being used to pay off the Promissory Notes.

We agree that we shall not incur additional indebtedness (or grant any liens) other than (i) with the prior written consent of the Selling Stockholder or (ii) additional indebtedness which is subordinated to the Promissory Notes in form and substance reasonably acceptable to the Selling Stockholder; provided, however, we can, without limitation or consent, (a) incur debt or indebtedness in an amount up to \$250,000, incur any debt or indebtedness that does not take the form of loans from banks or other finance providers, such as credit facilities or revolving debt arrangements, or the sale of debt securities to investors, and is not otherwise for borrowed money, (b) incur short-term financing of necessary corporate expenditures such as directors and officers liability insurance and ordinary course short-term financing of payables, and (c) incur facility, equipment and other lease financing classified as debt under U.S. Generally Accepted Accounting Principles, or GAAP.

The Selling Stockholder has agreed that none of the Selling Stockholder, its sole member, any of their respective officers, or any entity managed or controlled by the Selling Stockholder or its sole member will engage in or effect, directly or indirectly, for its own account or for the account of any other of such persons or entities, any short sales of the common stock or hedging transaction that establishes a net short position in the common stock during the term of the SEPA.

Because the per share purchase price that Yorkville will pay for shares of common stock, or the Purchase Shares, pursuant to any Advance that we may elect to effect pursuant to the SEPA will be determined by reference to the VWAP during the applicable period for such Advance on the applicable purchase date for such Advance, or the Purchase Date, as of the date of this prospectus, we cannot determine the actual purchase price per share that the Selling Stockholder will be required to pay for any Purchase Shares that we may elect to sell to the Selling Stockholder under the SEPA from and after the Effective Date and, therefore, we cannot be certain how many Purchase Shares, in the aggregate, we may issue and sell to the Selling Stockholder under the SEPA from and after the Effective Date. As of December 30, 2024, there were 35,085,718 shares of our common stock outstanding, of which 29,044,596 shares were held by non-affiliates of our company. If all of the 41,289,033 shares offered for resale by the Selling Stockholder under this prospectus were issued and outstanding as of the date hereof, such shares would represent approximately 54.1% of the total number of outstanding shares of common stock and approximately 142.2% of the total number of outstanding shares of common stock held by non-affiliates of our company, in each case as of December 30, 2024.

Although the SEPA provides that we may sell up to \$25.0 million of our common stock to the Selling Stockholder, only 41,289,033 Purchase Shares are being registered under the Securities Act for resale by the Selling Stockholder under the registration statement that includes this prospectus. If we were to issue and sell all of such 41,289,033 Purchase Shares to the Selling Stockholder at the prices per share determined in accordance with the SEPA (without taking into account the 19.99% Exchange Cap limitation), we would only receive \$25.0 million in aggregate gross proceeds from the sale of such Purchase Shares to the Selling Stockholder under the SEPA. Depending on the market prices of our common stock on the purchase dates on which we elect to sell such Purchase Shares to the Selling Stockholder under the SEPA, we may need to register under the Securities Act additional shares of our common stock for resale by the Selling Stockholder which, together with the 41,289,033 Purchase Shares included in this prospectus, will enable us to issue and sell to the Selling Stockholder such aggregate number of shares of common stock under the SEPA as will be necessary in order for us to receive aggregate proceeds equal to the Selling Stockholder's \$25.0 million maximum aggregate purchase commitment available to us under the SEPA.

If we elect to issue and sell to Yorkville more than the 7,013,635 shares of common stock being registered under the Securities Act for resale by Yorkville under the registration statement that includes this prospectus, which we have the right, but not the obligation, to do, we must first (i) obtain stockholder approval to issue shares of common stock in excess of the Exchange Cap under the SEPA in accordance with applicable Nasdaq rules and (ii) file with the SEC one or more additional registration statements to register under the Securities Act for the offer and resale by Yorkville of any such additional shares of our common stock we wish to sell from time to time under the SEPA, which the SEC must declare effective, in each case before we may elect to sell any additional shares of our common stock to Yorkville under the SEPA. Any issuance and sale by us under the SEPA of a substantial amount of shares of common stock in addition to the 41,289,033 shares of common stock being registered for resale by Yorkville under the registration statement that includes this prospectus could cause additional substantial dilution to our stockholders.

The number of shares of common stock ultimately offered for resale by the Selling Stockholder through this prospectus is dependent in part upon the number of shares of common stock, if any, we elect to sell to the Selling Stockholder under the SEPA. The issuance of our common stock to the Selling Stockholder pursuant to the SEPA will not affect the rights or privileges of our existing stockholders, except that the economic and voting interests of each of our existing stockholders will be diluted. Although the number of shares of our common stock that our existing stockholders own will not decrease, the shares of our common stock owned by our existing stockholders will represent a smaller percentage of our total outstanding shares of our common stock after any such issuance.

Reverse Stock Split

On October 6, 2023, our board of directors and our stockholders each approved a 1-for-4 reverse stock split of all classes of our issued and outstanding capital stock (the "Reverse Stock Split"), and on October 31, 2023, we filed an amended and restated certificate of incorporation with the State of Delaware to immediately effect the Reverse Stock Split. All share and per share information in this prospectus have been adjusted to reflect the Reverse Stock Split, unless otherwise stated.

Implications of Being a Controlled Company

Our founder and Chief Executive Officer, Pete O'Heeron, collectively beneficially owns approximately 57% of the voting power of our outstanding voting securities and we are a "controlled company" within the meaning of the listing rules of The Nasdaq Stock Market LLC.

As long as our principal shareholder owns at least 50% of the voting power of our Company, we will continue to be a "controlled company" as defined under Nasdaq Listing Rules. As a controlled company, we are permitted to rely on certain exemptions from Nasdaq's corporate governance rules, including:

- an exemption from the rule that a majority of our board of directors must be independent directors;
- an exemption from the rule that the compensation of our chief executive officer must be determined or recommended solely by independent directors; and
- an exemption from the rule that our director nominees must be selected or recommended solely by independent directors.

Although we currently do not intend to rely on the "controlled company" exemption under the Nasdaq listing rules, we could elect to rely on this exemption in the future. As a result, you may not in the future have the same protection afforded to shareholders of companies that are subject to these corporate governance requirements.

Implications of Being an Emerging Growth Company and a Smaller Reporting Company

We are an "emerging growth company" as defined in the Securities Act of 1933, or the Securities Act, as modified by the Jumpstart Our Business Startups Act of 2012, or the JOBS Act. As such, we are eligible to take, and intend to take, advantage of certain exemptions from various reporting requirements applicable to other public companies that are not emerging growth companies for as long as we continue to be an emerging growth company, including (i) the exemption from the auditor attestation requirements with respect to internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act of 2002, or the Sarbanes-Oxley Act, (ii) the exemptions from say-on-pay, say-on-frequency and say-on-golden parachute voting requirements and (iii) reduced disclosure obligations regarding executive compensation in our periodic reports and proxy statements.

We will remain an emerging growth company until the earliest of (i) December 31, 2028, (ii) the last day of the fiscal year in which we have total annual gross revenue of at least \$1.235 billion, (iii) the last day of the fiscal year in which we are deemed to be a "large accelerated filer" as defined in Rule 12b-2 under the Securities Exchange Act of 1934, as amended, or the Exchange Act, which would occur if the market value of our common stock held by non-affiliates was \$700.0 million or more as of the last business day of the second fiscal quarter of such year or (iv) the date on which we have issued more than \$1.0 billion in non-convertible debt securities during the prior three-year period.

In addition, the JOBS Act provides that an emerging growth company can take advantage of an extended transition period for complying with new or revised accounting standards. This allows an emerging growth company to delay the adoption of certain accounting standards until those standards would otherwise apply to private companies. We have elected to avail ourselves of this extended transition period and, as a result, we may adopt new or revised accounting standards on the relevant dates on which adoption of such standards is required for non-public companies instead of the dates required for other public companies.

We are also a "smaller reporting company" as defined in the Exchange Act. We may continue to be a smaller reporting company even after we are no longer an emerging growth company. We may take advantage of certain of the scaled disclosures available to smaller reporting companies until the fiscal year following the determination that our common stock held by non-affiliates is \$250 million or more measured on the last business day of our second fiscal quarter, or our annual revenues are less than \$100 million during the most recently completed fiscal year and our common stock held by non-affiliates is \$700 million or more measured on the last business day of our second fiscal quarter.

Corporate Information

We were formed in April 2021 as a Texas limited liability company under the name FibroBiologics, LLC, and converted to a Delaware corporation in December 2021 under the name FibroBiologics, Inc. On April 12, 2023, we changed our name to FibroBiologics, Inc. Our principal executive offices are located at 455 E. Medical Center Blvd., Suite 300, Houston, Texas 77598. Our telephone number is (281) 671-5150 and our website address is www.fibrobiologics.com. Information contained on or that can be accessed through our website is neither a part of nor incorporated by reference into this prospectus, and you should not consider information on our website to be part of this prospectus. Our website address is included in this prospectus as an inactive textual reference only.

SUMMARY FINANCIAL AND OTHER DATA

The summary financial and other data set forth below should be read together with our financial statements and the related notes to those statements, as well as the "Management's Discussion and Analysis of Financial Condition and Results of Operations" section incorporated by reference into this prospectus. The statements of operations and cash flows data for the years ended December 31, 2023 and 2022, have been derived from our audited financial statements incorporated by reference into this prospectus. The statements of operations and cash flows data for the nine months ended September 30, 2024 and 2023, and the balance sheet data as of September 30, 2024, have been derived from our unaudited interim condensed financial statements incorporated by reference into this prospectus. The unaudited interim condensed

financial statements were prepared on a basis consistent with our audited financial statements and include in management's opinion, all adjustments, consisting of normal recurring adjustments, that we consider necessary for a fair presentation of the financial information set forth in those statements. Our historical results are not necessarily indicative of the results that may be expected in any future period.

	For the nine months ended September 30,		For the years ended December 31,	
	2024 (unaudited, in thousands, except shares and per share data)		2023 (in thousands, except shares and per share data)	
	2024	2023	2023	2022
Statements of Operations Data:				
Operating expenses:				
Research and development	\$ 3,148	\$ 1,595	\$ 2,368	\$ 1,147
General, administrative and other	6,877	4,814	6,521	3,320
Total operating expenses	10,025	6,409	8,889	4,467
Loss from operations	(10,025)	(6,409)	(8,889)	(4,467)
Other income/(expense):				
Change in fair value of warrant liability/liability instrument	4,349	—	(7,236)	—
Change in fair value of forward contract liability	(650)	—	—	—
Commitment fee expense	(1,941)	—	—	—
Other income/(expense)	31	(213)	(213)	—
Interest income	188	—	—	—
Interest expense	(14)	(146)	(147)	(654)
Net loss	\$ (8,062)	\$ (6,768)	\$ (16,485)	\$ (5,121)
Deemed dividend	—	(2,573)	(2,573)	—
Net loss attributable to common stockholders	\$ (8,062)	\$ (9,341)	\$ (19,058)	\$ (5,121)
Net loss per share, basic and diluted	\$ (0.25)	\$ (0.33)	\$ (0.68)	\$ (0.18)
Weighted-average shares outstanding, basic and diluted	32,457,473	28,230,842	28,230,842	28,230,842
Statements of Cash Flows Data:				
Net cash used in operating activities	\$ (8,828)	\$ (4,800)	\$ (6,401)	\$ (4,066)
Net cash used in investing activities	\$ (85)	\$ (493)	\$ (495)	—
Net cash provided by financing activities	\$ 7,577	\$ 13,793	\$ 13,793	\$ 5,925
As of September 30, 2024				
	(unaudited, in thousands)			
Balance Sheet Data:				
Cash and cash equivalents	\$ 7,827			
Working capital ¹	\$ 1,521			
Total assets	\$ 10,469			
Total liabilities	\$ 7,732			
Total stockholders' equity	\$ 2,737			

¹ We define working capital as current assets less current liabilities.

RISK FACTORS

An investment in our common stock involves a high degree of risk. Before you decide to invest in our common stock, you should carefully consider the following risks and uncertainties as well as the risks set forth under the section titled "Risk Factors" in our Annual Report on Form 10-K for the year ended December 31, 2023, or the Annual Report, and in our Quarterly Report on Form 10-Q for the three months ended September 30, 2024, or the Quarterly Report, both of which are incorporated by reference herein. You should also refer to the other information contained in this prospectus, and the documents incorporated by reference herein, including our financial statements and related notes and the section titled "Management's Discussion and Analysis of Financial Condition and Results of Operations" included in our Annual Report and in our Quarterly Report. The occurrence of one or more of the events or circumstances described in such risk factors, alone or in combination with other events or circumstances, may have a material adverse effect on our business, reputation, revenue, financial condition, results of operations and future prospects, in which event you could lose all or part of your investment. The risks and uncertainties described and incorporated by reference herein are not intended to be exhaustive and are not the only ones we face. Additional risks and uncertainties not presently known to us or that we currently deem immaterial may also impair our business operations. This prospectus also contains forward-looking statements that involve risks and uncertainties. See "Cautionary Note Regarding Forward-Looking Statements." Our actual results could differ materially and adversely from those anticipated in these forward-looking statements.

Risks Related to this Offering

It is not possible to predict the actual number of shares we will sell under the SEPA to Yorkville, or the actual gross proceeds resulting from those sales.

On December 20, 2024, we entered into the SEPA with Yorkville, pursuant to which Yorkville has committed to purchase up to \$25.0 million of shares of our common stock, subject to certain limitations and conditions set forth in the SEPA. The shares of our common stock that may be issued under the SEPA may be sold by us to Yorkville at our discretion from time to time for a period of up to 24 months, unless the SEPA is earlier terminated, beginning on the Effective Date.

We generally have the right to control the timing and amount of any sales of our shares of common stock to Yorkville under the SEPA. Sales of our common stock, if any, to Yorkville under the SEPA will depend upon market conditions and other factors to be determined by us. We may ultimately decide to sell to Yorkville all, some or none of the shares of our common stock that may be available for us to sell to Yorkville pursuant to the SEPA.

Because the per share purchase price that Yorkville will pay for Purchase Shares in any transaction that we may elect to effect pursuant to the SEPA will be determined by reference to the VWAP during the applicable period, respectively, on the applicable Purchase Date, as of the date of this prospectus, it is not possible for us to predict the number of shares of common stock that we will sell to Yorkville under the SEPA, the purchase price per share that Yorkville will pay for shares purchased from us under the SEPA, or the aggregate gross proceeds that we will receive from those purchases by Yorkville under the SEPA.

Although the SEPA provides that we may sell up to an aggregate of \$25.0 million of our common stock to Yorkville, only 41,289,033 shares of our common stock are being registered under the Securities Act for resale by Yorkville under the registration statement that includes this prospectus. If it becomes necessary for us to issue and sell to Yorkville under the SEPA more than the 41,289,033 Purchase Shares being registered under the Securities Act for resale by Yorkville under the registration statement that includes this prospectus in order to receive aggregate gross proceeds equal to \$25.0 million under the SEPA, we must first (i) obtain stockholder approval to issue shares of common stock in excess of the Exchange Cap under the SEPA in accordance with applicable Nasdaq rules and (ii) file with the SEC one or more additional registration statements to register under the Securities Act the resale by Yorkville of any such additional shares of our common stock we wish to sell from time to time under the SEPA, which the SEC must declare effective, in each case before we may elect to sell any additional shares of our common stock to Yorkville under the SEPA. Any issuance and sale by us under the SEPA of a substantial amount of shares of common stock in addition to the 41,289,033 shares of common stock being registered for resale by Yorkville under this prospectus could cause additional substantial dilution to our stockholders. The number of shares of our common stock ultimately offered for sale by Yorkville is dependent upon the number of shares of common stock, if any, we ultimately elect to sell to Yorkville under the SEPA.

Investors who buy shares at different times will likely pay different prices.

Pursuant to the SEPA, we will have discretion, subject to market demand, to vary the timing, prices, and numbers of shares sold to Yorkville. If and when we do elect to sell shares of our common stock to Yorkville pursuant to the SEPA, after Yorkville has acquired such shares, Yorkville may resell all, some or none of such shares at any time or from time to time in its discretion and at different prices. As a result, investors who purchase shares from Yorkville in this offering at different times will likely pay different prices for those shares, and so may experience different levels of dilution, and in some cases substantial dilution, and different outcomes in their investment results. Investors may experience a decline in the value of the shares they purchase from Yorkville in this offering as a result of future sales made by us to Yorkville at prices lower than the prices such investors paid for their shares in this offering. In addition, if we sell a substantial number of shares to Yorkville under the SEPA, or if investors expect that we will do so, the actual sales of shares or the mere existence of our arrangement with Yorkville may make it more difficult for us to sell equity or equity-related securities in the future at a time and at a price that we might otherwise wish to effect such sales.

Once we issue a Promissory Note, we do not have the right to control the timing and amount of the issuance of our common stock to Yorkville and, accordingly, it is not possible to predict the actual number of shares of common stock we will issue pursuant to the conversion of a Promissory Note at any one time or in total.

Once we issue a Promissory Note, we do not have the right to control the timing and amount of any issuances of our shares of common stock to Yorkville upon conversion of a Promissory Note. As the conversion price per share to be used upon conversion of the Promissory Notes will fluctuate based on the market prices of our shares of common stock, if any, it is not possible for us to predict the actual number of shares of common stock we will issue pursuant to the conversion of a Promissory Note at any one time or in total.

Sales of a substantial number of our securities in the public market by our existing stockholders could cause the price of our shares of common stock to fall.

Yorkville can resell, under this prospectus, up to 41,289,033 shares of common stock from time to time after the date of this prospectus and during the term of the SEPA. If all of the 41,289,033 shares offered for resale by Yorkville under this prospectus were issued and outstanding as of the date hereof (without taking into account the 19.99% Exchange Cap limitation), such shares would represent approximately 54.1% of the total number of outstanding shares of common stock and approximately 142.2% of the total number of outstanding shares of common stock held by non-affiliates, in each case as of December 30, 2024.

Sales of a substantial number of our shares of common stock in the public market by Yorkville and/or by our other existing stockholders, or the perception that those sales might occur, could depress the market price of our shares of common stock and could impair our ability to raise capital through the sale of additional equity securities.

Our management team will have broad discretion over the use of the net proceeds from our sale of shares of common stock to Yorkville, if any, and you may not agree with how we use the proceeds and the proceeds may not be invested successfully.

Our management team will have broad discretion as to the use of the net proceeds from our sale of shares of common stock to Yorkville, if any, and we could use such proceeds for purposes other than those contemplated at the time of commencement of this offering. Accordingly, you will be relying on the judgment of our management team with regard to the use of those net proceeds, and you will not have the opportunity, as part of your investment decision, to assess whether the proceeds are being used appropriately. It is possible that, pending their use, we may invest those net proceeds in a way that does not yield a favorable, or any, return for us. The failure of our management team to use such funds effectively could have a material adverse effect on our business, financial condition, operating results and cash flows.

CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus contains forward-looking statements that can involve substantial risks and uncertainties. All statements other than statements of historical facts contained in this prospectus, including statements regarding our future results of operations and financial position, business strategy, prospective products, product approvals, research and development costs, future revenue, timing and likelihood of success, plans and objectives of management for future operations, future results of anticipated products and prospects, plans and objectives of management are forward-looking statements. These statements involve known and unknown risks, uncertainties and other important factors that may cause our actual results, performance or achievements to be materially different from any future results, performance or achievements expressed or implied by the forward-looking statements.

In some cases, you can identify forward-looking statements by terms such as "anticipate," "believe," "contemplate," "continue," "could," "estimate," "expect," "intend," "may," "plan," "potential," "predict," "project," "should," "target," "will," or "would" or the negative of these terms or other similar expressions, although not all forward-looking statements contain these words. Forward-looking statements contained in this prospectus include, but are not limited to, statements about:

- the timing, progress and results of preclinical studies and clinical trials for our current and future product candidates, including statements regarding the timing of initiation and completion of studies or trials and related preparatory work, the period during which the results of the trials will become available and our research and development programs;
- the timing, scope or likelihood of regulatory submissions, filings, and approvals, including final regulatory approval of our product candidates;
- our ability to develop and advance product candidates into, and successfully complete, clinical trials;
- our expectations regarding the size of the patient populations for our product candidates, if approved for commercial use;
- the implementation of our business model and our strategic plans for our business, product candidates and technology;
- our commercialization, marketing and manufacturing capabilities and strategy;
- the pricing and reimbursement of our product candidates, if approved;
- the rate and degree of market acceptance and clinical utility of our product candidates, in particular, and cell therapy, in general;
- our ability to establish or maintain collaborations or strategic relationships or obtain additional funding;
- our competitive position;
- the scope of protection we and/or our licensors are able to establish and maintain for intellectual property rights covering our product candidates;
- developments and projections relating to our competitors and our industry;
- our estimates regarding expenses, future revenue, capital requirements and needs for additional financing;
- the period over which we estimate our existing cash and cash equivalents will be sufficient to fund our future operating expenses and capital expenditure requirements; and
- the impact of laws and regulations.

We have based these forward-looking statements largely on our current expectations and projections about our business, the industry in which we operate and financial trends that we believe may affect our business, financial condition, results of operations and prospects, and these forward-looking statements are not guarantees of future performance or development. These forward-looking statements speak only as of the date of this prospectus and are subject to a number of risks, uncertainties and assumptions described in the section titled "*Risk Factors*" and elsewhere in this prospectus. Because forward-looking statements are inherently subject to risks and uncertainties, some of which cannot be predicted or quantified, you should not rely on these forward-looking statements as predictions of future events. The events and circumstances reflected in our forward-looking statements may not be achieved or occur and actual results could differ materially from those projected in the forward-looking statements. Except as required by applicable law, we do not plan to publicly update or revise any forward-looking statements contained herein until after we distribute this prospectus, whether as a result of any new information, future events or otherwise.

In addition, statements that "we believe" and similar statements reflect our beliefs and opinions on the relevant subject. These statements are based upon information available to us as of the date of this prospectus, and while we believe such information forms a reasonable basis for such statements, such information may be limited or incomplete, and our statements should not be read to indicate that we have conducted an exhaustive inquiry into, or review of, all potentially available relevant information. These statements are inherently uncertain and you are cautioned not to unduly rely upon these statements.

MARKET AND INDUSTRY DATA

This prospectus includes estimates regarding market and industry data. Unless otherwise indicated, information concerning our industry and the markets in which we operate, including our general expectations, market position, market opportunity, and market size, are based on our management's knowledge and experience in the markets in which we operate, together with currently available information obtained from various sources, including publicly available information, industry reports and publications, surveys, our customers, trade and business organizations, and other contacts in the markets in which we operate. Certain information is based on management estimates, which have been derived from third-party sources, as well as data from our internal research.

In presenting this information, we have made certain assumptions that we believe to be reasonable based on such data and other similar sources and on our knowledge of, and our experience to date in, the markets in which we operate. While we believe the estimated market and industry data included in this prospectus is generally reliable, such information is inherently uncertain and imprecise. Market and industry data is subject to change and may be limited by the availability of raw data, the voluntary nature of the data gathering process, and other limitations inherent in any statistical survey of such data. In addition, projections, assumptions, and estimates of the future performance of the markets in which we operate are necessarily subject to uncertainty and risk due to a variety of factors, including those described in "Risk Factors" and "Cautionary Note Regarding Forward-Looking Statements." These and other factors could cause results to differ materially from those expressed in the estimates made by third parties and by us. Accordingly, you are cautioned not to place undue reliance on such market and industry data or any other such estimates.

The source of certain statistical data, estimates, and forecasts contained in this prospectus are the following independent industry publications or reports:

- "Degenerative Disc Disease Therapeutics Global Market Analysis, Insights and Forecast, 2022-2029" Fortune Business Insights;
- "Global Regenerative Medicine Market 2022-2029" Fortune Business Insights;
- "Global Multiple Sclerosis Drugs Market 2022-2029" Fortune Business Insights; and
- "Global Wound Care Market 2022-2029" Fortune Business Insights.

The content of the above sources, except to the extent specifically set forth in this prospectus, does not constitute a portion of this prospectus and is not incorporated herein.

TRADEMARKS, SERVICE MARKS AND TRADENAMES

We own or otherwise have rights to the trademarks, including those mentioned in this prospectus, used in conjunction with the operation of our business. This prospectus includes our own trademarks, which are protected under applicable intellectual property laws, as well as trademarks, service marks and tradenames of other entities, which are the property of their respective owners. Solely for convenience, trademarks, trade names and service marks referred to in this prospectus may appear without the ®, ™ or SM symbols, but such references are not intended to indicate, in any way, that the applicable licensor will not assert, to the fullest extent under applicable law, its rights to these trademarks, service marks and tradenames. We do not intend our use or display of other entities' trademarks, service marks or tradenames to imply a relationship with, or endorsement or sponsorship of us by, any other entities.

USE OF PROCEEDS

Yorkville, or the Selling Stockholder, may, or may not, elect to sell shares of our common stock covered by this prospectus. To the extent the Selling Stockholder chooses to sell shares of our common stock covered by this prospectus, we will not receive any proceeds from any such sales of our common stock.

We may receive up to \$25.0 million in aggregate gross proceeds under the SEPA from any sales we make to Yorkville pursuant to the SEPA. The net proceeds from sales, if any, under the SEPA, will depend on the frequency and prices at which we sell our common stock to Yorkville after the date of this prospectus. See the section titled "Plan of Distribution" in this prospectus for more information.

We expect to use the net proceeds from the sales under the SEPA for general corporate purposes.

DIVIDEND POLICY

We have never declared or paid cash dividends on our common stock. We currently intend to retain all available funds and any future earnings to fund the development, commercialization and growth of our business, and therefore we do not anticipate declaring or paying any cash dividends on our common stock in the foreseeable future. Any future determination as to the declaration and payment of dividends, if any, will be at the discretion of our board of directors. Any such determination will also depend upon our business prospects, operating results, financial condition, capital requirements, general business conditions and other factors that our board of directors may deem relevant. Our future ability to pay cash dividends on our common stock may also be limited by the terms of any future debt securities or credit facility.

CAPITALIZATION

The following table sets forth our cash and cash equivalents and capitalization as of September 30, 2024, as follows.

- on an actual basis; and
- on an as adjusted basis to give effect to the 41,289,033 shares of common stock that we may sell to Yorkville pursuant to the SEPA that are being registered in this registration statement at an assumed aggregate offering price of \$25.0 million, and after deducting estimated offering expenses payable by us.

This table should be read in conjunction with, and is qualified in its entirety by reference to, our financial statements and related notes incorporated by reference into this prospectus.

	As of September 30, 2024	
	Actual	As Adjusted
	(unaudited, in thousands, except for share and per share amounts)	
Cash and cash equivalents	\$ 7,827	\$ 31,070
Stockholders' equity:		
Preferred Stock, \$0.00001 par value; 10,000,000 shares authorized, actual and as adjusted; 2,500 Series C Preferred shares authorized, issued and outstanding, actual and as adjusted	—	—
Common Stock, \$0.00001 par value; 100,000,000 shares authorized, actual and as adjusted; 33,917,961 shares issued and outstanding, actual; 75,206,994 shares issued and outstanding, as adjusted	—	—
Additional paid-in capital	35,156	58,399
Accumulated deficit	(32,419)	(32,419)
Total stockholders' equity/(deficit)	\$ 2,737	\$ 25,980
Total capitalization	\$ 10,469	\$ 33,712

The number of shares of our common stock reflected in our actual and as adjusted information set forth in the table above excludes:

- 4,032,111 shares of common stock issuable upon exercise of stock options outstanding under our 2022 Stock Plan (as defined herein) as of September 30, 2024;
- 8,467,889 shares of common stock reserved for issuance under our 2022 Stock Plan;
- 10,321 shares of common stock underlying warrants that were issued in connection with the issuance of certain shares of the Series B-1 Preferred Stock;
- 1,167,757 shares of common stock sold to GEM pursuant to the GEM SPA subsequent to September 30, 2024.

PRINCIPAL AND SELLING STOCKHOLDERS

Security Ownership of Certain Beneficial Owners and Management

The following table sets forth, as of December 30, 2024, certain information regarding the beneficial ownership of our voting securities (being our common stock and our Series C Preferred Stock) by (i) each person or group of affiliated persons known by us to be the beneficial owner of more than 5% of our voting securities, (ii) each of our named executive officers, (iii) each of our directors, (iv) all of our directors and executive officers as a group and (v) the number of shares of our common stock held by, and registered for resale by means of this prospectus for, the Selling Stockholder. Except as otherwise indicated, all persons listed below have (i) sole voting power and investment power with respect to their common stock and Series C Preferred Stock, as applicable, except to the extent that authority is shared by spouses under applicable law, and (ii) record and beneficial ownership with respect to their common stock and Series C Preferred Stock, as applicable.

We are registering the shares of our common stock included in this prospectus pursuant to the provisions of the Registration Rights Agreement we entered into with Yorkville on December 20, 2024, in order to permit the Selling Stockholder to offer the shares included in this prospectus for resale from time to time. Except for the transactions contemplated by the SEPA and the Registration Rights Agreement and as set forth in the section titled “*Plan of Distribution*” in this prospectus, Yorkville has not had any material relationship with us within the past three years.

The table below presents information regarding the Selling Stockholder and the shares of our common stock that may be resold by the Selling Stockholder from time to time under this prospectus. This table is prepared based on information supplied to us by the Selling Stockholder. The Selling Stockholder may sell some, all or none of the shares being offered for resale in this offering. We do not know how long the Selling Stockholder will hold the shares before selling them and, except as set forth in the section titled “*Plan of Distribution*” in this prospectus, we are not aware of any existing arrangements between the Selling Stockholder and any other stockholder, broker, dealer, underwriter or agent relating to the sale or distribution of the shares of our common stock being offered for resale by this prospectus.

Beneficial ownership is determined in accordance with Rule 13d-3(d) promulgated by the SEC under the Exchange Act, and includes shares of our common stock with respect to which the Selling Stockholder has sole or shared voting and investment power. Because the purchase price to be paid by the Selling Stockholder for shares of our common stock, if any, that we may elect to sell to the Selling Stockholder in one or more transactions from time to time under the SEPA will be determined on the applicable purchase dates therefor, the actual number of shares of our common stock that we may sell to the Selling Stockholder under the SEPA may be fewer than the number of shares being offered for resale under this prospectus. In calculating the number of shares beneficially owned after the offering, we assume the resale by the Selling Stockholder of all of the shares of our common stock being offered for resale pursuant to this prospectus.

In accordance with the rules of the SEC, beneficial ownership includes voting or investment power with respect to securities and includes the common stock issuable pursuant to options and warrants that are exercisable or settled within 60 days of December 30, 2024. Shares of common stock issuable pursuant to options and warrants are deemed outstanding for computing the percentage of the class beneficially owned by the person holding such securities but are not deemed outstanding for computing the percentage of the class beneficially owned by any other person.

In the table below, the percentage of beneficial ownership is based on, as applicable: (i) 35,085,718 shares of our common stock outstanding; and (ii) 2,500 shares of our Series C Preferred Stock outstanding, each as of December 30, 2024.

Each share of our Series C Preferred Stock is entitled to 13,000 votes per share and each share of our common stock is entitled to one vote per share. The percentage of total voting power in the table below is based on the sum of (i) 35,085,718 votes, being the total number of votes associated with 35,085,718 shares of our common stock (with each share of common stock having one vote) and (ii) 32,500,000 votes, being the total number of votes associated with 2,500 shares of Series C Preferred Stock (with each share of Series C Preferred Stock having 13,000 votes).

Unless otherwise indicated, the business address of each of the individuals and entities named below is c/o FibroBiologics, Inc., 455 E. Medical Center Blvd., Suite 300, Houston, Texas 77598.

Name and address of Beneficial Owner	Beneficial Ownership Prior to the Offering					Shares of Common Stock Being Registered Pursuant to this Prospectus	
	Common Stock		Series C Preferred Stock		Percentage of Total Voting Power ⁽¹⁾		
	Shares	%	Shares	%			
5% Stockholders:							
Pete O'Heeron, MSHA ⁽²⁾	6,871,751	19.1%	2,500	100%	57.4%	—	
Golden Knight Incorporated, L.P. ⁽³⁾	2,125,001	6.1%	—	—	3.1%	—	
Named Executive Officers and Directors							
Pete O'Heeron, MSHA ⁽²⁾	6,871,751	19.1%	2,500	100%	57.4%	—	
Mark Andersen, CPA CFA ⁽⁴⁾	214,925	*	—	—	*	—	
Hamid Khoja, Ph.D. ⁽⁵⁾	255,468	*	—	—	*	—	
Robert E. Hoffman ⁽⁶⁾	109,510	*	—	—	*	—	
Victoria Niklas, M.D. ⁽⁷⁾	109,510	*	—	—	*	—	
Richard Cilento, Jr., MBA ⁽⁸⁾	194,735	*	—	—	*	—	
Stacy Coen, MBA ⁽⁹⁾	109,510	*	—	—	*	—	
Matthew Link ⁽¹⁰⁾	109,510	*	—	—	*	—	
Directors and Executive Officers as a Group (9 persons) ⁽¹¹⁾	7,974,919	21.5%	2,500	100%	58.2%	—	
Selling Stockholder:	—	—	—	—	—	41,289,033	
Total Number of Shares Being Registered							
Beneficial Ownership After the Offering							
Name and address of Beneficial Owner	Common Stock		Series C Preferred Stock		Percentage of Total Voting Power ⁽¹⁾		
	Shares	%	Shares	%	Percentage of Total Voting Power ⁽¹⁾		
5% Stockholders:							
Pete O'Heeron, MSHA ⁽²⁾	6,871,751	8.9%	2,500	100%	35.8%		
Golden Knight Incorporated, L.P. ⁽³⁾	2,125,001	2.8%	—	—	2.0%		
Named Executive Officers and Directors							
Pete O'Heeron, MSHA ⁽²⁾	6,871,751	8.9%	2,500	100%	35.8%		
Mark Andersen, CPA CFA ⁽⁴⁾	214,925	*	—	—	*		

Hamid Khoja, Ph.D. ⁽⁵⁾	255,468	*	—	—	—	*
Robert E. Hoffman ⁽⁶⁾	109,010	*	—	—	—	*
Victoria Niklas, M.D. ⁽⁷⁾	109,010	*	—	—	—	*
Richard Cilento, Jr., MBA ⁽⁸⁾	194,735	*	—	—	—	*
Stacy Coen, MBA ⁽⁹⁾	109,010	*	—	—	—	*
Matthew Link ⁽¹⁰⁾	109,010	*	—	—	—	*
Directors and Executive Officers as a Group (9 persons)⁽¹¹⁾	7,972,919	10.2%	2,500	100%	36.5%	
Selling Stockholder:						
YA II PN, Ltd. ⁽¹²⁾	—	—	—	—	—	—

* Less than 1%.

(1) After giving effect to the rights of the Series C Preferred Stock to 13,000 votes per share.

(2) Shares of common stock include 5,906,647 shares of common stock and 965,104 vested stock options to purchase common stock. The 2,500 shares of Series C Preferred Stock held constitute the maximum number of Series C Preferred Stock we are authorized to issue. Each share of Series C Preferred Stock is entitled to 13,000 votes. For as long as they remain outstanding, the shares of Series C Preferred Stock are subject to an irrevocable proxy issued by Pete O'Heeron in favor and for the benefit of the Board, as more particularly described in this prospectus.

(3) Michael F. Newlin and Cindy L. Newlin, as General Partners of Golden Knight Incorporated, L.P., share discretionary authority to vote and dispose of the shares directly held by Golden Knight Incorporated, L.P. and may be deemed to be the beneficial owners of such shares. The address for Golden Knight Incorporated, L.P. is 3773 Howard Hughes Pkwy, Suite 500S, Las Vegas, NV 89189-6014.

(4) Shares of common stock include 214,925 vested stock options to purchase common stock. Mr. Andersen resigned as Chief Financial Officer effective November 15, 2024.

(5) Shares of common stock include 11,250 shares of common stock and 244,218 vested stock options to purchase common stock.

(6) Shares of common stock include 7,500 shares of common stock and 101,510 vested stock options to purchase common stock.

(7) Shares of common stock include 7,500 shares of common stock and 101,510 vested stock options to purchase common stock.

(8) Shares of common stock include 93,225 shares of common stock and 101,510 vested stock options to purchase common stock.

(9) Shares of common stock include 7,500 shares of common stock and 101,510 vested stock options to purchase common stock.

(10) Shares of common stock include 7,500 shares of common stock and 101,510 vested stock options to purchase common stock.

(11) The 2,500 shares of Series C Preferred Stock held constitute the maximum number of Series C Preferred Stock we are authorized to issue. Each share of Series C Preferred Stock is entitled to 13,000 votes. For as long as they remain outstanding, the shares of Series C Preferred Stock are subject to an irrevocable proxy issued by Pete O'Heeron in favor and for the benefit of the Board, as more particularly described in this prospectus.

(12) Investment decisions for YA II PN, Ltd. are made by Mr. Mark Angelo. The business address of YA II PN, Ltd. is 1012 Springfield Avenue, Mountainside, NJ 07092. Assumes the sale of all shares of our common stock being offered for resale pursuant to this prospectus.

DESCRIPTION OF OUR SECURITIES

General

The following description summarizes certain important terms of our capital stock. Because it is only a summary, it does not contain all the information that may be important to you. For a complete description of the matters set forth in this section, you should refer to our amended and restated certificate of incorporation and our amended and restated bylaws, which are incorporated by reference into the registration statement of which this prospectus forms a part, and to the applicable provisions of Delaware law.

Authorized Capital Stock

Our amended and restated certificate of incorporation authorizes us to issue 110,000,000 shares of capital stock, which may consist of: (i) 100,000,000 shares of common stock, par value \$0.00001 per share, and (ii) 10,000,000 shares of preferred stock, par value \$0.00001 per share, of which 2,500 shares are designated as Series C Preferred Stock.

Pursuant to our amended and restated certificate of incorporation, our board of directors has the authority, without stockholder approval except as required by Nasdaq rules, to issue additional shares of our capital stock.

Common Stock

Our amended and restated certificate of incorporation provides that :

- holders of common stock have voting rights for the election of our directors and all other matters requiring stockholder action, except with respect to amendments to our certificate of incorporation that alter or change the powers, preferences, rights or other terms of any outstanding preferred stock if the holders of such affected series of preferred stock are entitled to vote on such an amendment;
- holders of common stock are entitled to one vote per share on matters to be voted on by stockholders and are also entitled to receive such dividends, if any, as may be declared from time to time by our board of directors in its discretion out of funds legally available therefor;
- the payment of dividends, if any, on the common stock will be subject to the prior payment of dividends on any outstanding preferred stock;
- upon our liquidation or dissolution, the holders of common stock will be entitled to receive *pro rata* all assets remaining available for distribution to stockholders after payment of all liabilities and provision for the liquidation of any shares of preferred stock outstanding at that time; and
- our stockholders have no conversion, preemptive or other subscription rights and there are no sinking fund or redemption provisions applicable to the common stock.

Preferred Stock

Our amended and restated certificate of incorporation provides that shares of preferred stock may be issued from time to time in one or more series. Our board of directors is authorized to fix the voting rights, if any, designations, powers, preferences, the relative, participating, optional or other special rights, if any, and any qualifications, limitations and restrictions thereof, applicable to the shares of each series. Our board of directors is able to, without stockholder approval, issue preferred stock with voting and other rights that could adversely affect the voting power and other rights of the holders of the common stock and could have anti-takeover effects. The ability of our board of directors to issue preferred stock without stockholder approval could have the effect of delaying, deferring or preventing a change of our control or the removal of our existing management.

Series C Preferred Stock

There is currently one series of designated preferred stock, being the Series C Preferred Stock, 2,500 total shares of which are authorized and all of which 2,500 authorized shares of Series C Preferred Stock are issued, outstanding and held by Pete O'Heeron, our founder, Chief Executive Officer and Chairperson of our board of directors. The outstanding shares of Series C Preferred Stock are fully paid and nonassessable.

The Series C Preferred Stock rank senior to our common stock upon our liquidation, dissolution, winding up or otherwise.

The Series C Preferred Stock is entitled to vote on any matter to be voted on by our stockholders, in each case voting together with the holders of our common stock as a

single class, and each share of Series C Preferred Stock is entitled to 13,000 votes. The Series C Preferred Stock is entitled to receive the same prior notice of any meeting of stockholders as provided to our common stockholders.

The Series C Preferred Stock is not entitled to any dividend, whether payable in cash, stock or property.

Subject to the superior rights of other, then outstanding, classes or series of preferred stock, in the event of any liquidation, dissolution or winding up of our company, the Series C Preferred Stock shall be entitled to receive, prior and in preference to any distribution in such liquidation, dissolution or winding up of any of our assets to the holders of our common stock, a liquidation preference of \$18.00 per share (subject to appropriate adjustment in the event of any stock split, combination or other similar recapitalization).

The Series C Preferred Stock may be converted at any time as follows:

- At the option of the holder, a share of Series C Preferred Stock may be converted into one share of our common stock; and
- Upon the election of the holders of a majority of the then outstanding shares of Series C Preferred Stock, all outstanding shares of Series C Preferred Stock may be converted into an equal number of shares of our common stock, on a one-for-one basis.

In addition, the Series C Preferred Stock is subject to a mandatory conversion upon any transfer of the Series C Preferred Stock. Each share of Series C Preferred Stock shall automatically convert, without the payment of additional consideration by or to the holder thereof, into one fully paid and non-assessable share of our common stock, upon any transfer of any share of Series C Preferred Stock, whether or not for value. Any shares of Series C Preferred Stock converted as described above must be retired and cancelled and may not be reissued as shares of such series.

For as long as the Series C Preferred Stock remain outstanding, the aggregate number of shares of Series C Preferred Stock then outstanding, shall be proportionately adjusted for any increase or decrease in the number of issued shares of our common stock resulting from a subdivision or combination of our common stock or other similar recapitalization, in each case effected without our receipt of consideration.

The Series C Preferred Stock is subject to an irrevocable proxy issued by Pete O'Heeron, the holder of all of the Series C Preferred Stock, in favor and for the benefit of, our board of directors, granting our board of directors the irrevocable proxy, for as long as the Series C Preferred Stock remains outstanding, to vote all of the Series C Preferred Stock on all matters on which the Series C Preferred Stock are entitled to vote, in any manner that our board of directors may determine in its sole and absolute discretion; provided, however, that such irrevocable proxy shall not, without the written consent of Pete O'Heeron, permit our board of directors to vote the Series C Preferred Stock with respect to any proposal to amend, delete or waive any rights of Pete O'Heeron with respect to the Series C Preferred Stock as set forth in our amended and restated certificate of incorporation. In light of the superior voting rights associated with the Series C Preferred Stock, the irrevocable proxy is intended to ensure that such superior voting rights are utilized in our best interest and to avoid or mitigate conflicts that may arise in the future for Pete O'Heeron as an individual stockholder employee.

Anti-Takeover Effects of our Certificate of Incorporation, Bylaws and Delaware Law

Our amended and restated certificate of incorporation and amended and restated bylaws include a number of provisions that may have the effect of delaying, deferring or preventing another party from acquiring control of us and encouraging persons considering unsolicited tender offers or other unilateral takeover proposals to negotiate with our board of directors rather than pursue non-negotiated takeover attempts. These provisions include the items described below.

Classified Board

Our amended and restated certificate of incorporation requires our board of directors to be divided into three classes serving staggered three-year terms, with one class elected each year. The classification of directors has the effect of making it more difficult for stockholders to change the composition of our board of directors.

Stockholder Actions by Written Consent

Our amended and restated certificate of incorporation requires that, any action required or permitted to be taken by our stockholders must be effected at a duly-called annual or special meeting of our stockholders and may not be effected by written consent in lieu of a meeting.

Advance Notice Requirements

Our amended and restated bylaws establish advance notice procedures with regard to stockholder proposals relating to the nomination of candidates for election as directors or new business to be brought before meetings of our stockholders. These procedures specify that notice of stockholder proposals must be timely given in writing to our corporate secretary prior to the meeting at which the action is to be taken, and define what is considered timely. Our amended and restated bylaws specify the requirements as to form and content of all stockholder notices. These requirements may preclude stockholders from bringing matters before the stockholders at an annual or special meeting.

Director Removal and Vacancies

Our amended and restated certificate of incorporation requires that, a member of our board of directors or our entire board may only be removed for cause, and then only by the affirmative vote of the holders of at least 66^{2/3}% in voting power of our stock entitled to vote on such removal. In addition, our amended and restated certificate of incorporation requires that, any newly created directorship that results from an increase in the number of directors or any vacancy on our board of directors, must be filled solely by the affirmative vote of a majority of the total number of directors then in office, even if less than a quorum, or by a sole remaining director and may not be filled by the stockholders.

Supermajority Voting Requirements

Our amended and restated certificate of incorporation requires the affirmative vote of the holders of at least 66^{2/3}% in voting power of our stock entitled to vote thereon to (i) amend, alter or repeal our bylaws and adopt new bylaws or (ii) to amend, alter, change or repeal, or adopt any provision inconsistent with, certain provisions of our certificate of incorporation, including the provisions relating to the requirement to have a classified board, the provisions relating to the removal of directors, the provision precluding stockholder action by written consent and the choice of forum provision in our amended and restated certificate of incorporation (as explained below).

Undesignated Preferred Stock

Our amended and restated certificate of incorporation provides for authorized shares of preferred stock. The existence of authorized but unissued shares of preferred stock may enable our board of directors to discourage an attempt to obtain control of us by means of a merger, tender offer, proxy contest or otherwise. For example, if in the due exercise of its fiduciary obligations, our board of directors were to determine that a takeover proposal is not in the best interests of our shareholders, our board of directors could cause shares of preferred stock to be issued without shareholder approval in one or more private offerings or other transactions that might dilute the voting or other rights of the proposed acquirer or insurgent shareholder or shareholder group. In this regard, our amended and restated certificate of incorporation grants our board of directors broad power to establish the rights and preferences of authorized and unissued shares of preferred stock. The issuance of shares of preferred stock could decrease the amount of earnings and assets available for distribution to holders of shares of common stock. The issuance may also adversely affect the rights and powers, including voting rights, of these holders and may have the effect of delaying, deterring or preventing a change in our control.

Exclusive Forum

Our amended and restated certificate of incorporation provides that, unless we consent in writing to the selection of an alternative forum, the (i) Court of Chancery of the State of Delaware (or, if the Court of Chancery does not have jurisdiction, the federal district court for the District of Delaware) shall, to the fullest extent permitted by law, be the sole and exclusive forum for (a) any derivative action or proceeding brought on our behalf, (b) any action asserting a claim of breach of a fiduciary duty owed by any of our directors, officers or other employees to us or our stockholders, (c) any action arising pursuant to any provision of the DGCL, our certificate of incorporation or our bylaws or (d) any action asserting a claim governed by the internal affairs doctrine and (ii) to the fullest extent permitted by law, the federal district courts of the United States of

America shall be the exclusive forum for the resolution of any complaint asserting a cause or causes of action arising under the Securities Act, including all causes of action asserted against any defendant to such complaint. The foregoing provision would not preclude stockholders that assert claims under the Exchange Act from bringing such claims in federal court, to the extent that the Exchange Act confers exclusive federal jurisdiction over such claims, subject to applicable law. Our choice of forum provision may impose additional litigation costs on stockholders in pursuing claims and may limit a stockholder's ability to bring a claim in a judicial forum that it believes to be favorable for disputes with us or any of our directors, officers or other employees, which may discourage lawsuits with respect to such claims.

Limitation of Liability and Indemnification of Directors and Officers

Our amended and restated certificate of incorporation provides that our directors and officers will be indemnified by us to the fullest extent authorized by Delaware law.

These provisions may discourage stockholders from bringing a lawsuit against our directors for breach of their fiduciary duty. These provisions also may have the effect of reducing the likelihood of derivative litigation against directors and officers, even though such an action, if successful, might otherwise benefit us and our stockholders. Furthermore, a stockholder's investment may be adversely affected to the extent we pay the costs of settlement and damage awards against directors and officers pursuant to these indemnification provisions. We believe that these provisions and insurance are necessary to attract and retain talented and experienced directors and officers. In addition, we entered into separate indemnification agreements with each of our directors and executive officers.

Section 203 of the DGCL

As a Delaware corporation, we are subject to the provisions of Section 203 of the DGCL. This statute prevents certain Delaware corporations, under certain circumstances, from engaging in a "business combination" with an "interested stockholder." In general, Section 203 defines an "interested stockholder" as an entity or person who, together with the person's affiliates and associates, beneficially owns 15% or more of the outstanding voting stock of the corporation.

A "business combination" includes a merger or sale of more than 10% of our assets. However, the above provisions of Section 203 of the DGCL do not apply if:

- the business combination takes place more than three years after the interested stockholder became an "interested stockholder;"
- our board of directors approves the transaction that made the stockholder an "interested stockholder" prior to the date of the transaction;
- after the completion of the transaction that resulted in the stockholder becoming an interested stockholder, that stockholder owned at least 85% of our voting stock outstanding, other than statutorily excluded shares of common stock; or
- on or subsequent to the date of the transaction, the business combination is approved by our board of directors and authorized at a meeting of our stockholders, and not by written consent, by an affirmative vote of at least two-thirds of the outstanding voting stock not owned by the interested stockholder.

Listing

Our common stock commenced trading on The Nasdaq Global Market under the symbol "FBLG" on January 31, 2024.

Transfer Agent and Registrar

The transfer agent and registrar for our common stock is VStock Transfer LLC. The transfer agent and registrar's address is 18 Lafayette Place, Woodmere, NY 11598. The transfer agent and registrar can be contacted by phone at: (212) 828-8436.

SHARES ELIGIBLE FOR FUTURE SALE

Sales of a substantial number of shares of our common stock in the public market, or the perception that such sales could occur, could adversely affect the public price of our common stock and may make it more difficult for you to sell your shares at a time and price that you deem appropriate. We will have no input if and when the Selling Stockholder may, or may not, elect to sell the shares of common stock covered by this prospectus or the prices at which any such sales may occur.

As of December 30, 2024, a total of 35,085,718 shares of our common stock were outstanding. All of the shares of common stock being registered for resale under the registration statement of which this prospectus forms a part will be freely tradable in the public market without restriction or further registration under the Securities Act, unless these shares are held by "affiliates," as that term is defined in Rule 144 under the Securities Act. Any shares not registered hereunder or pursuant to another registration statement will be "restricted securities," as that term is defined in Rule 144 under the Securities Act. These restricted securities are eligible for public sale only if they are registered under the Securities Act or if they qualify for an exemption from registration, including under Rules 144 or 701 under the Securities Act, which are summarized below. Restricted securities also may be sold outside of the United States to non-U.S. persons in accordance with Rule 904 of Regulation S.

Subject to the provisions of Rule 144 or Regulation S under the Securities Act, as well as our insider trading policy, these restricted securities will be available for sale in the public market after the date of this prospectus.

Rule 144

In general, under Rule 144 as currently in effect, an eligible shareholder is entitled to sell such shares without complying with the manner of sale, volume limitation, or notice provisions of Rule 144, subject to compliance with the public information requirements of Rule 144. To be an eligible shareholder under Rule 144, such shareholder must not be deemed to have been one of our affiliates for purposes of the Securities Act at any time during the 90 days preceding a sale and who has beneficially owned the shares of common stock proposed to be sold for at least six months, including the holding period of any prior owner other than our affiliates. If such a person has beneficially owned the shares of common stock proposed to be sold for at least one year, including the holding period of any prior owner other than our affiliates, then such person is entitled to sell such shares without complying with any of the requirements of Rule 144.

In general, under Rule 144, as currently in effect, our affiliates or persons selling common stock on behalf of our affiliates are entitled to sell shares. Within any three-month period, such shareholders may sell a number of shares that does not exceed the greater of:

- 1% of the number of shares of common stock then outstanding, which equals 350,857 shares on December 30, 2024, or
- the average weekly trading volume of our common stock on Nasdaq during the four calendar weeks preceding the filing of a notice on Form 144 with respect to such sale.

Sales under Rule 144 by our affiliates or persons selling shares of common stock on behalf of our affiliates also are subject to certain manner of sale provisions and notice requirements and to the availability of current public information about us.

Rule 701

Rule 701 generally allows a shareholder who was issued shares under a written compensatory plan or contract and who is not deemed to have been our affiliate during the immediately preceding 90 days, to sell these shares in reliance on Rule 144, but without being required to comply with the public information, holding period, volume limitation, or notice provisions of Rule 144. Rule 701 also permits our affiliates to sell their Rule 701 shares under Rule 144 without complying with the holding period requirements of Rule 144.

Registration Statements on Form S-8

We have filed a registration statement on Form S-8 under the Securities Act to register 12,500,000 shares of our common stock subject to outstanding stock options or reserved for issuance under our 2022 Stock Plan. Such registration statement automatically became effective upon filing with the SEC on May 15, 2024. However, shares registered on Form S-8 may be subject to the volume limitations and the manner of sale, notice, and public information requirements of Rule 144.

MATERIAL U.S. FEDERAL INCOME TAX CONSEQUENCES TO NON-U.S. HOLDERS

The following is a general discussion of material U.S. federal income tax considerations and certain U.S. federal estate tax considerations relating to the acquisition, ownership, and disposition of our common stock applicable to non-U.S. holders that purchase our common stock in this offering and hold it as a "capital asset" within the meaning of Section 1221 of the U.S. Internal Revenue Code of 1986, as amended, or the Code (generally, property held for investment). For purposes of this discussion, a "non-U.S. holder" means a beneficial owner of our common stock (other than an entity or arrangement that is treated as a partnership for U.S. federal income tax purposes) that is not, for U.S. federal income tax purposes, any of the following:

- an individual who is a citizen or resident of the United States;
- a corporation (or entity treated as a corporation for United States federal income tax purposes) created or organized in or under the laws of the United States, any state thereof or the District of Columbia;
- an estate, the income of which is includable in gross income for U.S. federal income tax purposes regardless of its source; or
- a trust if (i) a court within the United States is able to exercise primary supervision over the administration of the trust and one or more "United States persons," as defined under the Code, or U.S. persons, have the authority to control all substantial decisions of the trust or (ii) such trust has made a valid election to be treated as a U.S. person for U.S. federal income tax purposes.

If a partnership (or other entity or arrangement treated as a partnership for U.S. federal income tax purposes) holds our common stock, the tax treatment of a partner therein will generally depend on the status of the partner and the activities of the partnership. Partners of a partnership holding our common stock should consult their tax advisors as to the particular U.S. federal income tax consequences applicable to them.

This discussion is based on current provisions of the Code, final, temporary and proposed Treasury regulations promulgated thereunder, or the Treasury Regulations, judicial decisions, published rulings and administrative pronouncements of the U.S. Internal Revenue Service, or IRS, all as in effect as of the date of this prospectus and all of which are subject to change or to differing interpretation, possibly with retroactive effect. Any change could alter the tax consequences to non-U.S. holders described herein. There can be no assurance that the IRS will not challenge one or more of the tax consequences described herein.

This discussion does not address all aspects of U.S. federal income and estate taxation that may be relevant to a particular non-U.S. holder in light of that non-U.S. holder's individual circumstances nor does it address any aspects of U.S. state, local or non-U.S. taxes, other U.S. federal tax, the alternative minimum tax, or the unearned income Medicare contribution tax on net investment income. This discussion also does not consider any specific facts or circumstances that may apply to a non-U.S. holder and does not address the special tax rules applicable to particular non-U.S. holders, such as:

- banks, insurance companies and other financial institutions;
- brokers or dealers or traders in securities;
- tax-exempt organizations;
- pension plans;
- persons who hold our common stock as part of a straddle, hedge, conversion transaction, synthetic security or other integrated investment or who have elected to mark securities to market;
- controlled foreign corporations, passive foreign investment companies, and corporations that accumulate earnings to avoid U.S. federal income tax;
- non-U.S. governments; and
- U.S. expatriates and former citizens or long-term residents of the United States.

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THIS SUMMARY IS NOT INTENDED TO CONSTITUTE A COMPLETE DESCRIPTION OF ALL TAX CONSEQUENCES FOR NON-U.S. HOLDERS RELATING TO THE OWNERSHIP AND DISPOSITION OF OUR COMMON STOCK. PROSPECTIVE HOLDERS OF OUR COMMON STOCK SHOULD CONSULT WITH THEIR TAX ADVISORS REGARDING THE TAX CONSEQUENCES TO THEM (INCLUDING THE APPLICATION AND EFFECT OF ANY STATE, LOCAL, NON-U.S. INCOME AND OTHER TAX LAWS) OF THE ACQUISITION, OWNERSHIP AND DISPOSITION OF OUR COMMON STOCK.

Distributions

As discussed under "*Dividend Policy*" above, we do not expect to make distributions on our common stock in the foreseeable future. However, if we do make distributions of cash or property on our common stock, such distributions will constitute dividends for U.S. federal income tax purposes to the extent paid from our current or accumulated earnings and profits, as determined under U.S. federal income tax principles. Amounts of distributions not treated as dividends for U.S. federal income tax purposes will first constitute a tax-free return of capital of the non-U.S. holder's investment and be applied against and reduce a non-U.S. holder's adjusted tax basis in its common stock, but not below zero. Any remaining excess will be treated as capital gain and will be treated as described below under "*Gain on Sale or Other Disposition of Common Stock*." Because we may not know the extent to which a distribution is a dividend for U.S. federal income tax purposes at the time it is made, for purposes of the withholding rules discussed below we or the applicable withholding agent may treat the entire distribution as a dividend. Any such distributions will also be subject to the discussions below under the headings "*FATCA*" and "*Backup Withholding, Information Reporting and Other Reporting Requirements*."

Subject to the discussion in the next two paragraphs, dividends paid to a non-U.S. holder generally will be subject to withholding of U.S. federal income tax at a 30% rate or such lower rate as may be specified by an applicable income tax treaty between the United States and such holder's country of residence.

Dividends we pay to a non-U.S. holder that are effectively connected with such non-U.S. holder's conduct of a trade or business within the United States (and, if required by an applicable tax treaty, are attributable to a U.S. permanent establishment or a fixed base maintained by such non-U.S. holder) will generally be exempt from the U.S. federal withholding tax described above, if the non-U.S. holder complies with applicable certification and disclosure requirements (generally including provision of a valid IRS Form W-8ECI (or applicable successor form) certifying that the dividends are effectively connected with the non-U.S. holder's conduct of a trade or business within the United States). Instead, such dividends generally will be subject to U.S. federal income tax on a net income basis, at regular U.S. federal income tax rates as would apply if such holder were a U.S. person (as defined in the Code). Any U.S. effectively connected income received by a non-U.S. holder that is classified as a corporation for U.S. federal income tax purposes may also be subject to an additional "branch profits tax" at a rate of 30% (or such lower rate as may be specified by an applicable income tax treaty).

A non-U.S. holder of our common stock who claims the benefit of an applicable income tax treaty between the United States and such holder's country of residence generally will be required to provide a properly executed IRS Form W-8BEN or W-8BEN-E (or successor form) and satisfy applicable certification and other requirements. Non-U.S. holders are urged to consult their tax advisors regarding their entitlement to benefits under a relevant income tax treaty and the specific methods available to them to satisfy these requirements.

Gain on Sale or Other Disposition of Common Stock

Subject to the discussion below under the headings "*FATCA*" and "*Backup Withholding, Information Reporting and Other Reporting Requirements*," a non-U.S. holder generally will not be subject to U.S. federal income tax on any gain realized upon the sale or other disposition of the non-U.S. holder's shares of our common stock unless:

- the gain is effectively connected with a trade or business carried on by the non-U.S. holder within the United States (and, if required by an applicable income tax treaty, is attributable to a U.S. permanent establishment or fixed base maintained by such non-U.S. holder);

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- the non-U.S. holder is an individual and is present in the United States for 183 days or more in the taxable year of disposition and certain other conditions are met; or
- we are or have been a "U.S. real property holding corporation" for U.S. federal income tax purposes at any time within the shorter of the five-year period preceding such disposition or such non-U.S. holder's holding period of our common stock, and, provided that our common stock is regularly traded in an established securities market (including the Nasdaq) within the meaning of applicable Treasury Regulations, the non-U.S. holder has held, directly, indirectly, or constructively, at any time during said period, more than 5% of our common stock.

Gain that is effectively connected with the conduct of a trade or business in the United States generally will be subject to U.S. federal income tax on a net income tax basis, at regular U.S. federal income tax rates that apply to U.S. persons. If the non-U.S. holder is a non-U.S. corporation, the branch profits tax described above also may apply to such effectively connected gain. An individual non-U.S. holder who is subject to U.S. federal income tax because the non-U.S. holder was present in the United States for 183 days or more during the year of sale or other disposition of our common stock will be subject to a flat 30% tax (or such lower rate as may be specified by an applicable income tax treaty) on the gain derived from such sale or other disposition, which may be offset by certain U.S. source capital losses, if any. We believe that we are not and we do not anticipate becoming a U.S. real property holding corporation for U.S. federal income tax purposes. Non-U.S. holders should consult their tax advisors regarding potentially applicable income tax treaties that may provide for different rules.

FATCA

Withholding taxes may be imposed under the Foreign Account Tax Compliance Act, or FATCA, on certain types of payments made to non-U.S. financial institutions and certain other non-U.S. entities. Specifically, a 30% withholding tax may be imposed on dividends (including deemed dividends) paid on our common stock, to a "foreign financial institution" or a "non-financial foreign entity" (each as defined in the Code), unless (i) the foreign financial institution undertakes certain diligence and reporting obligations, (ii) the non-financial foreign entity either certifies it does not have any "substantial United States owners" (as defined in the Code) or furnishes identifying information regarding each substantial U.S. owner, or (iii) the foreign financial institution or non-financial foreign entity otherwise qualifies for an exemption from these rules. Foreign financial institutions located in jurisdictions that have an intergovernmental agreement with the U.S. governing FATCA may be subject to the reporting rules of that intergovernmental agreement. Because we may not know the extent to which a distribution is a dividend for U.S. federal income tax purposes at the time it is made, for purposes of these withholding rules we or the applicable withholding agent may treat the entire distribution as a dividend. Although withholding under FATCA would have applied also to payments of gross proceeds from the sale or other disposition of stock on or after January 1, 2019, proposed Treasury Regulations would eliminate FATCA withholding on payments of gross proceeds entirely. Taxpayers generally may rely on these proposed Treasury Regulations until final Treasury Regulations are issued. Under certain circumstances, a non-U.S. holder will be eligible for refunds or credits of withholding taxes imposed under FATCA by timely filing a U.S. federal income tax return. Prospective investors should consult their tax advisors regarding the potential application of these withholding provisions.

Backup Withholding, Information Reporting and Other Reporting Requirements

We must report annually to the IRS and to each non-U.S. holder the amount of any distributions paid to, and the tax withheld with respect to, each non-U.S. holder. These reporting requirements apply regardless of whether withholding was reduced or eliminated by an applicable income tax treaty. Copies of this information reporting may also be made available under the provisions of a specific income tax treaty or agreement with the tax authorities in the country in which the non-U.S. holder resides or is established.

A non-U.S. holder will generally be subject to backup withholding for dividends on our common stock paid to such holder unless such holder certifies under penalties of perjury that, among other things, it is a non-U.S. holder (provided that the payor does not have actual knowledge or reason to know that such holder is a U.S. person) or otherwise establishes an exemption.

Information reporting and backup withholding generally will apply to the proceeds of a disposition of our common stock by a non-U.S. holder effected by or through the U.S. office of any broker, U.S. or non-U.S., unless the holder certifies its status as a non-U.S. holder and satisfies certain other requirements, or otherwise establishes an exemption. Generally, information reporting and backup withholding will not apply to a payment of disposition proceeds to a non-U.S. holder where the transaction is effected outside the United States through a non-U.S. office of a broker. However, for information reporting purposes, dispositions effected through a non-U.S. office of a broker with substantial U.S. ownership or operations generally will be treated in a manner similar to dispositions effected through a U.S. office of a broker. Non-U.S. holders should consult their tax advisors regarding the application of the information reporting and backup withholding rules to them.

Backup withholding is not an additional income tax. Any amounts withheld under the backup withholding rules from a payment to a non-U.S. holder generally can be credited against the non-U.S. holder's U.S. federal income tax liability, if any, or refunded, provided that the required information is furnished to the IRS in a timely manner. Non-U.S. holders should consult their tax advisors regarding the application of the information reporting and backup withholding rules to them.

U.S. Federal Estate Tax

Shares of our common stock that are owned or treated as owned by an individual who is not a citizen or resident of the United States (as specially defined for U.S. federal estate tax purposes) at the time of death are considered U.S. situs assets and will be included in the individual's gross estate for U.S. federal estate tax purposes. Such shares, therefore, may be subject to U.S. federal estate tax, unless an applicable estate tax or other treaty provides otherwise.

The preceding discussion of material U.S. federal income tax considerations and certain U.S. federal estate tax considerations is for information only. It is not legal or tax advice. Prospective investors should consult their tax advisors regarding the particular U.S. federal, state, local and non-U.S. tax consequences of acquiring, owning and disposing of our common stock, including the consequences of any proposed changes in applicable laws.

PLAN OF DISTRIBUTION

The shares of our common stock offered by this prospectus are being offered by the Selling Stockholder. The shares may be sold or distributed from time to time by Yorkville directly to one or more purchasers or through brokers, dealers, or underwriters who may act solely as agents at market prices prevailing at the time of sale, at prices related to the prevailing market prices, at negotiated prices, or at fixed prices, which may be changed. The sale of the shares of our common stock offered by this prospectus could be effected in one or more of the following methods:

- ordinary brokers' transactions;
- transactions involving cross or block trades;
- through brokers, dealers, or underwriters who may act solely as agents;
- "at the market" into an existing market for our common stock;
- in other ways not involving market makers or established business markets, including direct sales to purchasers or sales effected through agents;
- in privately negotiated transactions; or
- any combination of the foregoing.

In order to comply with the securities laws of certain states, if applicable, the shares may be sold only through registered or licensed brokers or dealers. In addition, in certain states, the shares may not be sold unless they have been registered or qualified for sale in the state or an exemption from the state's registration or qualification requirement is available and complied with.

Yorkville is an "underwriter" within the meaning of Section 2(a)(11) of the Securities Act only with respect to Advances under the SEPA. Yorkville is not an "underwriter" within the meaning of Section 2(a)(11) of the Securities Act with respect to conversion of the Promissory Notes.

Except as set forth above, we know of no existing arrangements between Yorkville and any other stockholder, broker, dealer, underwriter or agent relating to the sale or distribution of the shares of our common stock offered by this prospectus.

Brokers, dealers, underwriters or agents participating in the distribution of the shares of our common stock offered by this prospectus may receive compensation in the form of commissions, discounts, or concessions from the purchasers, for whom the broker-dealers may act as agent, of the shares sold by Yorkville through this prospectus. The compensation paid to any such particular broker-dealer by any such purchasers of shares of our common stock sold by Yorkville may be less than or in excess of customary commissions. Neither we nor Yorkville can presently estimate the amount of compensation that any agent will receive from any purchasers of shares of our common stock sold by Yorkville.

We may from time to time file with the SEC one or more supplements to this prospectus or amendments to the registration statement of which this prospectus forms a part to amend, supplement or update information contained in this prospectus, including, if and when required under the Securities Act, to disclose certain information relating to a particular sale of shares offered by this prospectus by Yorkville, including with respect to any compensation paid or payable by Yorkville to any brokers, dealers, underwriters or agents that participate in the distribution of such shares by Yorkville, and any other related information required to be disclosed under the Securities Act.

We will pay the expenses incident to the registration under the Securities Act of the offer and sale of the shares of our common stock covered by this prospectus by Yorkville.

As consideration for Yorkville's commitment to purchase shares of common stock at our direction upon the terms and subject to the conditions set forth in the SEPA, we will pay Yorkville a commitment fee in the amount of 1% of the Commitment Amount, or the Commitment Fee, by the issuance of such number of common stock equal to the Commitment Fee divided by the average VWAP for the three trading days prior to the 10 trading-day anniversary of the Effective Date. In accordance with FINRA Rule 5110, the Commitment Fee is deemed to be underwriting compensation in connection with sales of our shares of common stock by Yorkville to the public. In addition, we paid Yorkville a structuring fee of \$25,000 and agreed to reimburse Yorkville for its reasonable and documented outside legal fees incurred in connection with this transaction, up to a cap of \$35,000.

We also agreed to pay DBC a cash fee of 6.5% based upon the aggregate gross proceeds received from the sales of common stock that we elect to make to the Selling Stockholder pursuant to the SEPA. We also agreed to reimburse DBC for its reasonable and documented out-of-pocket costs and expenses in connection with the offering in the amount of up to \$75,000. Furthermore, we agreed with DBC to engage DBC as an exclusive sales agent in connection with an at-the-market offering program we implement during the period beginning on February 1, 2025 and ending on January 31, 2026 and pay DBC in cash, upon each sale of common stock, an amount equal to two and one half of one percent (2.5%) of the gross proceeds from each sale.

We also have agreed to indemnify Yorkville, DBC, and certain other persons against certain liabilities in connection with the offering of shares of our common stock offered hereby, including liabilities arising under the Securities Act or, if such indemnity is unavailable, to contribute amounts required to be paid in respect of such liabilities. Yorkville has agreed to indemnify us against liabilities under the Securities Act that may arise from certain written information furnished to us by Yorkville specifically for use in this prospectus or, if such indemnity is unavailable, to contribute amounts required to be paid in respect of such liabilities. Insofar as indemnification for liabilities arising under the Securities Act may be permitted to our directors, officers, and controlling persons, we have been advised that in the opinion of the SEC this indemnification is against public policy as expressed in the Securities Act and is therefore, unenforceable.

We estimate that the total expenses for the offering will be approximately \$256,600.

Yorkville has represented to us that at no time prior to the date of the SEPA has Yorkville, its sole member, any of their respective officers, or any entity managed or controlled by Yorkville or its sole member, engaged in or effected, in any manner whatsoever, directly or indirectly, for its own account or for the account of any of its affiliates, any short sale (as such term is defined in Rule 200 of Regulation SHO of the Exchange Act) of our common stock or any hedging transaction, which establishes a net short position with respect to our common stock. Yorkville has agreed that during the term of the SEPA, none of Yorkville, its sole member, any of their respective officers, or any entity managed or controlled by Yorkville or its sole member, will enter into or effect, directly or indirectly, any of the foregoing transactions for its own account or for the account of any other such person or entity.

We have advised Yorkville that it is required to comply with Regulation M promulgated under the Exchange Act. With certain exceptions, Regulation M precludes Yorkville, any affiliated purchasers, and any broker-dealer or other person who participates in the distribution from bidding for or purchasing, or attempting to induce any person to bid for or purchase any security which is the subject of the distribution until the entire distribution is complete. Regulation M also prohibits any bids or purchases made in order to stabilize the price of a security in connection with the distribution of that security. All of the foregoing may affect the marketability of the securities offered by this prospectus.

This offering will terminate on the date that all shares of our common stock offered by this prospectus have been sold by Yorkville.

Our common stock is listed on the Nasdaq Global Market and trades under the symbol "FBLG". The transfer agent of our common stock is VStock Transfer LLC.

LEGAL MATTERS

The validity of the shares of common stock offered hereby will be passed upon for us by Norton Rose Fulbright US LLP, Houston, Texas.

EXPERTS

The financial statements of FibroBiologics, Inc. as of and for the years ended December 31, 2023 and 2022, have been audited by Withum Smith+Brown, PC, an independent registered public accounting firm, as stated in their report incorporated by reference herein. Such audited financial statements have been so included in reliance upon the report of such firm given upon their authority as experts in accounting and auditing.

WHERE YOU CAN FIND ADDITIONAL INFORMATION

We have filed with the SEC a registration statement on Form S-1 under the Securities Act, with respect to the shares of common stock being offered by this prospectus. This prospectus, which constitutes part of the registration statement, does not contain all of the information set forth in the registration statement or the exhibits and schedules filed therewith. Statements contained in this prospectus regarding the contents of any contract or any other document that is filed as an exhibit to the registration statement are not necessarily complete, and each such statement is qualified in all respects by reference to the full text of such contract or other document filed as an exhibit to the registration statement.

We are subject to the information and reporting requirements of the Exchange Act and, in accordance with such law, will file annual, quarterly and current reports, proxy statements and other information with the SEC. The SEC maintains a website that contains reports, proxy and information statements and other information regarding issuers that file electronically with the SEC. You may obtain documents that we file with the SEC at www.sec.gov. Our website address is www.fibrobiologics.com. We do not incorporate the information on or accessible through our website into this prospectus, and you should not consider any information on, or that can be accessed through, our website as part of this prospectus. Our website address is included in this prospectus as an inactive textual reference only.

INCORPORATION OF CERTAIN DOCUMENTS BY REFERENCE

SEC rules permit us to "incorporate by reference" certain information into this prospectus, which means that we can disclose important information about us by referring you to another document filed separately with the SEC. The information incorporated by reference is considered to be a part of this prospectus, except for information superseded by information contained in this prospectus or in any subsequently filed incorporated document. Because we are incorporating by reference future filings with the SEC, this prospectus is continually updated and those future filings may modify or supersede some of the information included or incorporated in this prospectus. This means that you must carefully review all of the SEC filings that we incorporate by reference to determine if any of the statements in this prospectus or in any document previously incorporated by reference have been modified or superseded. However, we undertake no obligation to update or revise any statements we make, except as required by law.

This prospectus incorporates by reference the documents listed below and any filings we make with the SEC under Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act (in each case, other than those documents or the portions of those documents furnished and not filed with the SEC) on or after the date of this prospectus and prior to the termination of the offering covered by this prospectus:

- our Annual Report on [Form 10-K](#) for the fiscal year ended December 31, 2023;
- those portions of our Definitive Proxy Statement on [Schedule 14A](#) that was filed on July 8, 2024 that address the disclosure requirements of Part III of Form 10-K;
- our Quarterly Reports on Form 10-Q for the quarterly periods ended [March 31, 2024](#), [June 30, 2024](#), and [September 30, 2024](#); and
- our Current Reports on Form 8-K, filed with the SEC on [February 2, 2024](#), [February 6, 2024](#), [February 8, 2024](#), [February 14, 2024](#), [February 20, 2024](#), [April 26, 2024](#), [June 27, 2024](#), [August 27, 2024](#), [August 28, 2024](#), [September 24, 2024](#), [October 29, 2024](#), [December 20, 2024](#), and [December 23, 2024](#) (except, in each case, any information, including exhibits, furnished and not filed with the SEC).

Any statement contained herein or in a document incorporated or deemed to be incorporated by reference in this prospectus will be deemed to be modified or superseded to the extent that a statement contained in this prospectus or in any subsequently filed document which is or is deemed to be incorporated by reference in this prospectus modifies or supersedes that statement. Any statement so modified or superseded will not be deemed, except as so modified or superseded, to constitute a part of this prospectus.

We will furnish without charge to each person, including any beneficial owner, to whom a prospectus is delivered, upon written or oral request, a copy of any or all of the documents incorporated by reference, including exhibits to these documents. Any such request may be made by writing or calling us at the following address or phone number:

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

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FibroBiologics, Inc.

Common Stock

PRELIMINARY PROSPECTUS

, 2024

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.

	Amount
SEC registration fee	\$ 14,634
Legal fees and expenses	200,000
Accounting fees and expenses	12,000
Miscellaneous expenses	30,000
Total	\$ 256,634

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 the 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 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 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 or officer 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 or officer, except for liability for any:

- breach of a director's or officer'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;
- in the case of a director, unlawful payment of dividends or unlawful stock purchase or redemption;
- transaction from which the director or officer derived an improper personal benefit; or
- in the case of an officer, any action by or in the right of the corporation.

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Our amended and restated certificate of incorporation contains a provision that precludes any director or officer of ours from being personally liable to us or our stockholders for monetary damages for breach of fiduciary duty as a director or officer, except for the aforementioned liabilities which we are not permitted to eliminate or limit under Section 102(b)(7) of the DGCL.

In addition, our amended and restated certificate of incorporation requires 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 or officer, 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 authorize us to purchase and maintain insurance on behalf of any person who is or was our director or officer, 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 maintain an insurance policy covering our officers and directors with respect to certain liabilities, including liabilities arising under the Securities Act. In addition, we entered 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. Unless stated otherwise, the sale of the securities listed below 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 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. No underwriters were involved in the sale of the securities.

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.

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.

In August 2022, we issued the equivalent of 28,179,592 of our nonvoting common stock to our parent company, FibroGenesis.

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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.

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.

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. 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.

Series C Preferred Stock

In January 2024, in conjunction with our Direct Listing, we issued 2,500 shares of Series C Preferred Stock with super voting rights to our CEO for no consideration.

Common Stock

In February 2024, we issued 142,298 shares of our common stock to GEM Global Yield LLC SCS, or GEM, for approximately \$1.8 million of net proceeds, pursuant to the draw-down notice we issued under the share purchase agreement dated November 12, 2021, with GEM and GEM Yield Bahamas Limited, or the GEM SPA, to have GEM purchase up to 900,000 shares of our common stock at a draw-down threshold price of no less than \$15.00 per share, which was closed after 142,298 shares of our common stock were purchased at \$13.50 per share. We then authorized a reduction of the draw-down threshold price to no less than \$13.50 per share, and GEM submitted one additional closing notice in March 2024 after 84,759 shares of our common stock were purchased pursuant to the GEM SPA at \$12.15 per share for net cash proceeds of approximately \$1.0 million.

On June 27, 2024, we issued 3,000,000 shares of common stock to facilitate a draw-down notice under the GEM SPA. The investor subsequently accepted the draw-down notice for 840,000 shares and sent a closing notice dated July 11, 2024, for the 840,000 shares issued at a net price of \$4.09 per share after applying the 10% discount and remitted \$3,436 thousand gross proceeds to us. Of the remaining 2,160,000 shares, 560,000 shares were returned and canceled and 1,600,000 shares were utilized in a subsequent draw-down notice.

On July 12, 2024, we issued a draw-down notice for 1,600,000 shares. The investor subsequently accepted the draw-down notice for 100,000 shares and sent a closing notice dated August 26, 2024, for the 100,000 shares issued at a net price of \$4.51 per share after applying the 10% discount and remitted \$451 thousand gross proceeds

On September 12, 2024, we issued a draw-down notice for 1,000,000 shares. The investor subsequently accepted a portion of the draw-down notice for 258,836 shares and sent a closing notice dated September 26, 2024, for the 258,836 shares issued at a net price of \$2.93 per share after applying the 10% discount and remitted \$758 thousand gross proceeds to us. With our consent, the investor submitted a second closing notice dated October 18, 2024 for an additional 15,683 shares issued at a net price of \$2.91 per share after applying the 10% discount and remitted \$46 thousand gross proceeds to us. Of the remaining 725,481 shares, 700,000 shares were returned and canceled, and 25,481 shares were utilized in a subsequent draw-down notice.

On December 19, 2024, we issued a draw-down notice for 1,152,074 shares and the investor concurrently accepted the draw-down notice in full at a purchase price of \$2.17 per share for aggregate gross proceeds of \$2.5 million. The investor satisfied the \$2.5 million payment by (a) waiving the remaining balance of the commitment fee owed to the investor for an aggregate amount of \$1.5 million, and our accepting the investor's waiver of the remaining balance of the commitment fee for an aggregate amount of \$1.5 million; and (b) terminating the warrant previously issued to the investor, in full.

Warrants

In January 2024, in accordance with the GEM SPA, we issued a warrant to purchase up to 1,299,783 shares of our common stock with an initial exercise price of \$21.54 per share to GEM Yield Bahamas Limited for no additional consideration.

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 Filing 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) 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

EXHIBIT INDEX

Exhibit Number	Exhibit Description	Incorporation By Reference			
		Form	SEC File No.	Exhibit	Filing Date
3.1	Amended and Restated Certificate of Incorporation of the Registrant	8-K	001-41934	3.1	August 28, 2024
3.2	Amended and Restated Bylaws of the Registrant	8-K	001-41934	3.1	June 27, 2024
4.1	Reference is made to exhibits 3.1 through 3.2 .				
4.2	Form of Warrant issued to Series B-1 Holders.	S-1/A	333-278938	4.3	April 26, 2024
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.	S-1/A	333-275361	10.1	December 4, 2023
10.2	Amendment 1 to the Intellectual Property Cross-License Agreement between SpinalCyte LLC and FibroBiologics, Inc., effective as of May 17, 2021.	10-Q	001-41934	10.1	August 7, 2024
10.3	Patent Assignment Agreement dated May 17, 2021, between SpinalCyte LLC and FibroBiologics, LLC.	S-1/A	333-275361	10.2	November 30 2023
10.4	Amendment 1 to the Patent Assignment Agreement, effective August 2, 2022.	S-1/A	333-275361	10.18	November 30 2023
10.5	Amendment 2 to the Patent Assignment Agreement between SpinalCyte LLC and FibroBiologics, Inc., effective as of May 17, 2021.	10-Q	001-41934	10.2	August 7, 2024
10.6	IP Transfer Agreement between SpinalCyte, LLC and FibroBiologics, LLC, dated as of May 17, 2021.	S-1/A	333-275361	10.17	November 30 2023

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10.7	Agreement Regarding Right of First Negotiation dated January 20, 2023.	S-1/A	333-275361	10.19	November 30 2023
10.8	Sublease Agreement between United Fire & Casualty Company and FibroBiologics, Inc., effective October 5, 2022.	S-1/A	333-275361	10.6	December 4, 2023
10.9	2022 Stock Plan.	S-1/A	333-275361	10.12	November 30 2023
10.10	Form of Stock Option Notice and Grant Agreement.	S-1/A	333-275361	10.20	December 4, 2023
10.11	Employment Agreement effective from December 1, 2023, between FibroBiologics, Inc. and Pete O'Heeron.	S-1/A	333-275361	10.22	December 4, 2023
10.12	Employment Agreement effective from July 20, 2021, between FibroBiologics, LLC and Hamid Khoja.	S-1/A	333-275361	10.13	December 4, 2023
10.13	Employment Agreement effective from May 31, 2022, between FibroBiologics, Inc. and Mark Andersen.	S-1/A	333-275361	10.14	December 4, 2023
10.14*	Separation Letter Agreement, dated October 28, 2024, between FibroBiologics, Inc. and Mark Andersen.				
10.15*	Offer Letter, dated October 29, 2024, between FibroBiologics, Inc. and Robert E. Hoffman.				
10.16	Employment Agreement effective from March 1, 2024, between FibroBiologics, Inc. and Ruben Garcia.	S-1/A	333-277019	10.24	March 15, 2024
10.17	Form of Indemnification Agreement between the Registrant and each of its Directors and Executive Officers.	S-1/A	333-275361	10.15	December 4, 2023
10.18+	Master Services Agreement, effective September 19, 2024, between FibroBiologics, Inc. and Charles River Laboratories, Inc.	8-K	001-41934	10.1	September 24, 2024
10.19	Standby Equity Purchase Agreement, dated December 20, 2024, between the Registrant and YA II PN, LTD.	8-K	001-41934	10.1	December 23, 2024
10.20	Convertible Promissory Note, dated December 20, 2024, between FibroBiologics, Inc. and YA II PN, LTD.	8-K	001-41934	10.2	December 23, 2024
10.21	Registration Rights Agreement, dated December 20, 2024, between the Registrant and YA II PN, LTD.	8-K	001-41934	10.3	December 23, 2024
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.	S-1	333-277019	23.3	February 12, 2024
24.1	Power of Attorney (included in the signature page hereto).				
107.1*	Filing Fee Table				

+ Portions of this exhibit have been redacted in compliance with Regulation S-K Item 601(b)(10)(iv).
* Filed herewith

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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 30, 2024.

FibroBiologics, Inc.

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

POWER OF ATTORNEY

We, the undersigned officers and directors of FibroBiologics, Inc., hereby severally constitute and appoint Pete O'Heeron and Ruben A. Garcia, and each of them singly (with full power to each of them to act alone), our true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution in each of them for us and in our name, place and stead, and in any and all capacities, to sign any and all amendments (including post-effective amendments) to this registration statement (or any other registration statement for the same offering that is to be effective upon filing pursuant to Rule 462(b) under the Securities Act of 1933), and to file the same, with all 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 full to all intents and purposes as we might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents or any of them, or their substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

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
<u>/s/ Pete O'Heeron</u> Pete O'Heeron	Chairperson and Chief Executive Officer (Principal Executive Officer)	December 30, 2024
<u>/s/ Robert E. Hoffman</u> Robert E. Hoffman	Interim Chief Financial Officer and Director (Principal Financial Officer and Principal Accounting Officer)	December 30, 2024
<u>/s/ Victoria Niklas, M.D.</u> Victoria Niklas, M.D.	Director	December 30, 2024
<u>/s/ Richard Cilento</u> Richard Cilento	Director	December 30, 2024
<u>/s/ Stacy Coen</u> Stacy Coen	Director	December 30, 2024
<u>/s/ Matthew Link</u> Matthew Link	Director	December 30, 2024


NORTON ROSE FULBRIGHT

December 30, 2024

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

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

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**) under the Securities Act of 1933, as amended (the **Securities Act**), relating to the offer and resale of up to 41,289,033 shares of common stock of the Company (the **Shares**) that may be acquired by YA II PN, LTD (**Yorkville**) in connection with a standby equity purchase agreement between the Company and Yorkville dated as of December 20, 2024 (the **SEPA**). 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 SEPA;
- (c) the Amended & Restated Certificate of Incorporation and Bylaws of the Company; and
- (d) a Unanimous Written Consent of the Company's Board of Directors approving the issuance of the Shares.

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.

December 30, 2024

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NORTON ROSE FULBRIGHT

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 duly authorized and, when acquired by Yorkville pursuant to the SEPA, will be validly issued, 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

October 28, 2024

Mr. Mark Andersen
Chief Financial Officer
FibroBiologics, Inc.
455 E. Medical Center Blvd., Suite 300
Houston, Texas 77598

Re: Transition

Dear Mark:

You have announced your intention to resign from your position of Chief Financial Officer of FibroBiologics, Inc. (the “Company”) on the date that is the earlier of (i) the date an interim or new Chief Financial Officer commences employment with the Company and (ii) November 15, 2024 (such date, the “Officer Resignation Date”).

This letter agreement confirms the terms and conditions for your transition that have been discussed:

1. **Transition Period and Transition Period Duties** : In consideration for your promises in this letter agreement, during the period beginning from the Officer Resignation Date until the Separation Date (as defined below) (the “Transition Period”), you shall continue to serve as an employee of the Company but will no longer have the powers, duties and responsibilities commensurate with the position of Chief Financial Officer. During the Transition Period, your primary responsibility will be to transition your duties and institutional knowledge to the interim or new Chief Financial Officer (or his or her designee), and to provide assistance on or lead projects as reasonably requested by the Company’s Chief Executive Officer and/or the interim or new Chief Financial Officer.
2. **Termination of Employment**: Your employment with the Company will terminate effective as of the end of business on November 15, 2024, or such earlier date that you and the Company mutually agree in writing (such date, the “Separation Date”).
3. **Compensation**: Prior to, and during, the Transition Period, you will continue to be paid your full base salary of \$325,000 per year, payable in accordance with the Company’s normal payroll practices. You will continue to be eligible for all regular employee benefits during the Transition Period, provided, however, that you will remain eligible for coverage under the Company’s healthcare benefit plans only if you work at least 30 hours per week and otherwise continue to qualify for participation in such plans in accordance with their terms. During the Transition Period, you will be reimbursed for authorized work-related expenses in accordance with the Company’s expense reimbursement policy. Should you execute, and not revoke, the additional release of claims set forth in Exhibit A, you will be entitled to the additional compensation set forth therein following the Separation Date.

4. **Equity Awards**: You will not be entitled to any future equity award grants from the Company. However, your outstanding equity awards consisting of options to purchase Company shares (“Options”) shall continue to vest in accordance with their terms until the Separation Date. All Options held by you that are unvested as of the Separation Date shall terminate and be forfeited as of such date. Except as otherwise expressly set forth herein, your Options shall continue to be governed by the definitive grant documents related thereto.
5. **Return of Company Property**: On or before your Separation Date, except to the extent otherwise mutually agreed between you and the Company, you will return all property of the Company that came into your possession as a result of your employment, including, but not limited to, the originals and all copies of all documents and files (whether paper or electronic), keys, company credit cards, telephones, computers, and other Company equipment.
6. **Confidential Information and Trade Secrets**: You agree to fully comply with the terms of your Employment Agreement, including (a) the requirements of Section 5 of your Employment Agreement related to Intellectual Property Rights, and (b) the terms of the Employment Agreement that remain in effect after your employment ends.
7. **Release of Claims**: By signing this letter agreement, you are representing that you are not aware of any factual basis for any legal claims against the Company and that you have been paid all wages, commissions and bonuses that you believe that you are owed through the date you sign this letter agreement. Since the benefits in this letter agreement go beyond what you are entitled to under the Company’s policies, you agree that this letter agreement constitutes a full and final settlement of any and all claims, known or unknown, of any kind that you or your dependents may have through the date you sign this letter agreement against the Company or any of its parent or affiliated companies and their officers, directors, shareholders, employees, insurers, agents, successors, or assigns (“Released Parties”), and you agree never to bring any legal action against any of the Released Parties based on any such claim, except for a claim for violation of the federal Age Discrimination in Employment Act, which is not waived in this letter agreement. The claims released in this letter agreement include, but are not limited to, claims arising from your hiring, employment, compensation, or separation, and arising under any contract or law.
8. **Confidentiality**: You represent and agree that you will not hereafter disclose the facts, terms or amount of this letter agreement to anyone other than your personal advisors or tax preparers, all of whom, together with their employees and agents, if any, will be informed of and bound by the confidentiality provision. You understand that this specifically prevents, but is not limited to, disclosures to any past or present employee, or applicant for employment, of the Company or any of its related entities. The parties agree that the confidentiality obligations set forth in this Section 8 shall not apply to any terms or amounts set forth in this letter agreement that are otherwise made public by the Company.

9. **Voluntary Agreement**: You acknowledge that you are entering into this letter agreement freely and voluntarily with a full understanding of its terms including the release of all claims.

10. **Complete Agreement:** You agree that this letter agreement sets forth all of the terms, promises, representations and understandings between you and the Company and that it supersedes any previous understandings or agreements, except as provided for in Section 12 below and as provided in any other agreements you have signed with the Company concerning confidential information, trade secrets, the assignment of inventions or other restrictive covenants, which agreements shall remain in effect.
11. **No Admission:** This letter agreement is offered and entered for the purpose of assisting you in your transition to another opportunity. It is not, and you agree not to contend that it is, an admission of any wrongdoing of any kind by the Company, its employees or any of the other Released Parties.
12. **At-Will Employment:** If you accept this offer of transition assistance, you will remain an at-will employee until the Separation Date. Therefore, you could decide to end your employment before your Separation Date and the Company likewise could do so. Except as expressly modified by this letter agreement, the Employment Agreement between you and the Company effective May 31, 2022 (as amended, the "Employment Agreement") shall remain in full force and effect in accordance with its terms until the Separation Date; however, for the avoidance of doubt, (i) neither your voluntary resignation as the Company's Chief Financial Officer, nor the termination of your employment pursuant to Section 2 above shall give rise to any severance benefits under the Employment Agreement, and (ii) the additional compensation referenced in the last sentence of Section 3 above shall be governed by the General Release attached hereto as Exhibit "A".

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You should consult with your own personal attorney to the extent you desire before signing this letter agreement. We appreciate your willingness to assist us during this period of transition.

Sincerely,

/s/ Pete O'Heeron

Name: Pete O'Heeron
Title: Chief Executive Officer

I voluntarily accept and agree to the terms and conditions of this letter agreement.

/s/ Mark Andersen

Name: Mark Andersen
Date: 10/28/2024

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Exhibit A

GENERAL RELEASE

This General Release (this "Agreement") is hereby entered into by and between Mark Andersen, an individual (the "Employee"), and FibroBiologics, Inc., on behalf of itself and all of its affiliated entities (collectively, the "Company").

1. **Effective Date.** Except as otherwise provided herein, this Agreement shall be effective on the eighth calendar day after it has been executed by both of the parties (the "Effective Date"), unless the Specified Sections (as defined in Section 12(b), below) have been timely and properly revoked as provided in Section 12(b) before the Effective Date.
2. **Separation from Employment.** The Employee has been employed by the Company as its Chief Financial Officer on an at-will basis pursuant to the employment agreement between the Company and the Employee effective as of May 31, 2022 (the "Employment Agreement"), as modified by that certain transition services letter agreement effective as of October 28, 2024 (the "Transition Agreement"). The Employee separated from his employment with the Company, effective at the close of business on November 15, 2024 (the "Separation Date"). The parties hereto agree that the Employment Agreement and Transition Agreement shall be terminated as of the Separation Date, except as expressly set forth herein.
3. **Continuation of Benefits After the Separation Date.** The Employee's coverage under the Company's health care benefits plans will end on the Separation Date, but the Employee shall have the right to continue his group health benefits coverage in accordance with the provisions of the Consolidated Omnibus Budget Reconciliation Act of 1986 ("COBRA"). Except as expressly provided in this Agreement or in the plan documents governing the Company's employee benefit plans, after the Separation Date, the Employee will no longer be eligible for, receive, accrue, or participate in any benefits or benefit plans provided by the Company, including, without limitation, the Company's 401(k) retirement plan; provided, however, that nothing in this Agreement shall waive the Employee's right to any vested amounts in the Company's 401(k) retirement plan, which amounts shall be handled as provided in the applicable plan documents.
4. **Final Wages.** The Company timely paid the Employee the unpaid portion of his annual salary earned through the Separation Date and for all earned and unused vacation time by having a check for this amount available for pick-up by, or, at his option, sending it to the Employee by overnight mail or direct deposit transfer on, that date.
5. **Transition Payment.** In return for the Employee's promises in this Agreement, the Company will (i) pay the Employee an amount equal to one-twelfth of the amount of the base salary in effect at the Separation Date, paid for a period of nine (9) months following the Separation Date (the "Transition Payment Period"), and (ii) will reimburse Employee for the monthly premium Employee timely pays during the Transition Payment Period or until Employee obtains new employment, whichever comes first, for COBRA continuation coverage timely elected by Employee for Employee and Employee's family (collectively, the "Transition Payments"). The Transition Payments will be subject to required payroll deductions and withholdings and will be made in installments and paid during a month on the Company's regular payroll cycle as if installments were payments of base salary, provided, however, that those Transition Payments otherwise scheduled to be made prior to the date the Agreement becomes effective shall accrue and be paid in the first payroll period that follows such date. The Company will reimburse Employee for the COBRA continuation coverage within 30 days after the date the Employee timely makes such premium payment, provided that the Employee provides the Company proof of such payment at the time the Employee makes the payment.

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6. **Stock Options.** As of the date of this Agreement, the Employee holds certain options (the “Options”) to purchase Company shares. Employee’s Options shall continue to be subject to the definitive documentation related to the grant of the Options. For the avoidance of doubt, any portion of the Employee’s Options that were not vested as of the Separation Date shall terminate and be forfeited as of the Separation Date. Subject to approval of the Compensation Committee, we will amend your Options to provide that the expiration date to exercise any Options that were vested as of your Separation Date shall not expire three months after your Separation Date and shall instead remain outstanding and exercisable for the shorter of (i) 270 days following the Separation Date, or (ii) the original Expiration Date as indicated in the Grant Notice with respect to the particular Option (as each such terms is defined in the Stock Option Grant Notice applicable to such Option).

7. **Acknowledgement of Total Compensation and Indebtedness.** The Employee acknowledges and agrees that the cash payments in Sections 4 and 5 of this Agreement extinguish any and all obligations for monies, or other compensation or benefits that the Employee claims or could claim to have earned or claims or could claim is owed to him as a result of his employment by the Company through the Separation Date, including any bonus or other incentive compensation.

8. **Tax Consequences.** The Employee acknowledges that the Company has not made any representations to him about, and that he has not relied upon any statement in this Agreement with respect to, any individual tax consequences that may arise by virtue of any payment provided under this Agreement, including, but not limited to, the applicability of Section 409A of the Internal Revenue Code.

9. **Releases.**

(a) (i) Except as otherwise expressly provided in this Agreement, the Employee, for himself and his heirs, executors, administrators, assigns, affiliates, successors and agents (collectively, the “Employee’s Affiliates”) hereby fully and without limitation releases and forever discharges the Company, its parents, affiliates, subsidiaries, predecessors, successors and each of their respective agents, representatives, shareholders, owners, officers, directors, employees, consultants, attorneys, auditors, insurers, accountants, successors and assigns (collectively, the “Releasees”), both individually and collectively, from any and all rights, claims, demands, liabilities, actions, causes of action, damages, losses, costs, expenses and compensation, of whatever nature whatsoever, known or unknown, fixed or contingent (“Claims”), which the Employee or any of the Employee’s Affiliates has or may have or may claim to have against the Releasees by reason of any matter, cause, or thing whatsoever, under any law or contract from the beginning of time to the Effective Date.

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(b) **Governmental Agencies.** Notwithstanding the release of claims language set forth in this Section 9, nothing in this Agreement prohibits or prevents Employee from filing a charge with or participating, testifying, or assisting in any investigation, hearing, whistleblower proceeding or other proceeding before any federal, state, or local government agency, nor does anything in this Agreement preclude, prohibit, or otherwise limit, in any way, Employee’s rights and abilities to contact, communicate with, report matters to, or otherwise participate in any whistleblower program administered by any such agencies.

(c) Nothing contained in this Section 9 or any other provision of this Agreement shall release or waive any right that the Employee has to indemnification by the Company with respect to which the Employee may be eligible as provided in any indemnification agreement signed by the Employee, any coverage for the benefit of the Employee under the Company’s director and officer insurance policy, or any other applicable source.

10. **Waiver of Unknown Claims.**

(a) The Employee understands and agrees that the release provided herein extends to all Claims released above whether known or unknown, suspected or unsuspected. The Employee expressly waives and relinquishes any and all rights he may have under any law designed to prevent the waiver of unknown claims.

(b) It is the intention of the Employee through this Agreement to fully, finally and forever settle and release the Claims as set forth above. In furtherance of such intention, the release herein given shall be and remain in effect as a full and complete release of such matters notwithstanding the discovery of any additional Claims or facts relating thereto.

11. **Release of Federal Age Discrimination Claims by the Employee.** The Employee hereby knowingly and voluntarily waives and releases all rights and claims, known or unknown, arising under the Age Discrimination In Employment Act of 1967, as amended, which he might otherwise have had against the Company or any of the other Releasees regarding any actions which occurred prior to the Effective Date.

12. **Rights Under the Older Workers Benefit Protection Act.** In accordance with the Older Workers Benefit Protection Act of 1990, the Employee hereby is advised of and acknowledges the following:

(a) The Employee has the right to consult with an attorney before signing this Agreement and is encouraged by the Company to do so;

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(b) The Employee has been given twenty-one (21) calendar days after being presented with this Agreement to decide whether or not to sign this Agreement. If the Employee signs this Agreement before the expiration of such period, the Employee does so voluntarily and after having had the opportunity to consult with an attorney; and

The Employee has seven (7) calendar days after signing this Agreement to revoke Sections 6, 7 and 9 through 12 of this Agreement (collectively, the “Specified Sections”), which must be revoked in their entirety and as a group, and the Specified Sections of this Agreement (as a group) will not be effective until that revocation period has expired without exercise. The Employee agrees that in order to exercise his right to revoke the Specified Sections of this Agreement within such seven (7) day period, he must do so in a signed writing delivered to the Company’s General Counsel, by email sent to: legal@fibrobiologics.com before the close of business on the seventh calendar day after he signs this Agreement. If the Employee timely revokes the Specified Sections of this Agreement, he will not receive any portion of the Transition Payments, the extending period of time to exercise the Options as set forth in Section 6 or any other benefits under this Agreement.

13. **Confidentiality of Agreement.** After the execution of this Agreement by the Employee, neither the Employee, his attorney, nor any person acting by, through, under or in concert with them, shall disclose any of the terms of or amount paid under this Agreement or the negotiation thereof to any individual or entity except to the extent previously publicly disclosed by the Company; provided, however, that the foregoing shall not prevent such disclosures by the Employee to his attorney, tax advisors and/or his spouse, or as may be required by law. The Company agrees that it will not disclose the terms of or amount paid under this Agreement to any individual or entity who does not have a legitimate business need to know; provided, however, that the foregoing shall not prevent such disclosures by the Company as may be required by law, including without limitation, pursuant to any rule or regulation by the Securities and Exchange Commission.

14. **No Filings.** The Employee warrants that as of the date of execution of this Agreement, he has not commenced, filed, participated in, offered testimony, or assisted any investigation, hearing, or proceeding (including any whistleblower proceeding) before any federal, state, or local government agency relating to the Company. In addition, to the maximum extent permitted by law, the Employee agrees that if any lawsuits or claims, charges or complaints are made against the Company or the other Releasees with any local, state or federal agency or court in whole or in part on his behalf, the Employee shall not be entitled to recover any individual monetary relief or other individual remedies, and that, if any such agency or court ever assumes jurisdiction over any such lawsuit, claim, charge or complaint and/or any agency purports to bring any legal proceeding, in whole or in part, on behalf of the Employee based upon events occurring prior to the execution of this Agreement, the Employee will request such agency or court to withdraw from and/or to dismiss the lawsuit, claim, charge or complaint with prejudice. The Employee further warrants that he has disclosed, or will disclose prior to the execution of this Agreement, any and all known or suspected violations of law. Such disclosure must include how he has firsthand knowledge of the known or suspected violation. If the Employee previously reported such known or suspected violation, such disclosure must also include who the violation was previously reported to and how such violation has not been cured. The Employee also agrees that to the maximum extent allowed by law he will not induce, encourage, solicit or assist any other person or entity to file or pursue any proceeding of any kind against the Company or the other Releasees or voluntarily appear or invite a subpoena to testify in any such legal proceeding. This Section 14 shall not prohibit the Employee from challenging the validity of the ADEA release in Section 11 of this Agreement.

15. **Confidential and Proprietary Information.**

(a) The Employee acknowledges that during the course of or related to his employment with the Company he was provided access to certain confidential and/or proprietary information regarding the Company and its business that is not generally known outside of the Company and that would not otherwise have been provided to him (collectively, "Confidential and Proprietary Information"). Confidential and Proprietary Information includes, without limitation, the following materials and information (whether or not reduced to writing and whether or not patentable or protected by copyright): legal strategies and advice; trade secrets; inventions; processes; formulae; programs; technical data; financial information; research and product development; marketing and advertising plans and strategies; customer identities, lists, and confidential information about customers and their buying habits; confidential information about prospects, suppliers, distributors, vendors, and key employees; personal information relating to the Company's employees; mailing and email lists; and any other confidential, proprietary and/or attorney-client privileged information relating to the Company or its business. The Employee agrees that the Confidential and Proprietary Information is the sole property of the Company. The Employee further agrees that he will not disclose to any person or use any such Confidential and Proprietary Information without the written consent of the Company's General Counsel. If the Employee is served with a deposition subpoena or other legal process calling for the disclosure of Confidential and Proprietary Information, or if he is contacted by any third person requesting such information, he will notify the Company's General Counsel as soon as is reasonably practicable after receiving notice and will cooperate with the Company in preventing or minimizing the disclosure thereof. The Employee acknowledges that certain rights and obligations set forth in the Employee's Employment Agreement (the "Confidential Information Agreement") extend beyond the Separation Date. In the event that any provision of this Section 15(a) or any other provision of this Agreement conflicts with the Confidential Information Agreement, the terms and provisions of the section(s) providing the greatest protection to the Company shall control.

(b) The Employee represents and warrants that he has returned all files, customer lists, financial information, mobile devices, computers (and related passwords), and other property of the Company that were in his possession or control without retaining either electronically stored or physical copies thereof, except to the extent otherwise mutually agreed between the Employee and the Company.

(c) Notwithstanding the confidentiality obligations set forth in this Section 15 or elsewhere in this Agreement, the Employee understands that, pursuant to the Defend Trade Secrets Act of 2016 ("DTSA"), the Employee will not be held criminally or civilly liable under any federal or state trade secret law for the disclosure of a trade secret that: (A) is made (i) in confidence to a federal, state, or local government official, either directly or indirectly, or to an attorney; and (ii) solely for the purpose of reporting or investigating a suspected violation of law; or (B) is made in a complaint or other document filed in a lawsuit or other proceeding, if such filing is made under seal. The Employee further understands that if a court of law or arbitrator determines that he misappropriated Company trade secrets willfully or maliciously, including by making permitted disclosures without following the requirements of the DTSA as detailed in this Section 15(c), then the Company may be entitled to an award of exemplary damages and attorneys' fees against him.

16. **Remedies.** The Employee acknowledges that any misappropriation or misuse of trade secrets or unauthorized disclosure of Confidential and Proprietary Information of the Company, and any violation of Sections 13 through 15 of this Agreement, will result in irreparable harm to the Company, and therefore, the Company shall, in addition to any other remedies, be entitled to immediate injunctive relief. In the event of a breach of any provision of this Agreement by the Employee, including Sections 13 through 15, the Company shall, without excluding other remedies available to them, be entitled to an award in an amount equal to the Transition Payment paid to him as of the date of such breach.

17. **Cooperation Clause.** The Employee agrees to cooperate with the Company's and its legal counsel's reasonable requests for information or assistance, including related to the Company's finance and accounting matters, any Company internal investigation or review of compliance, legal or any other issues, response to any lawfully served civil or criminal subpoenas, and defense of, or other participation in, any administrative, judicial, or other proceeding arising from any charge, complaint or other action which has been or may be filed relating to the period during which the Employee was engaged in employment with the Company. The Company agrees to reimburse the Employee for any reasonable expenses incurred by the Employee in connection with such cooperation as long as the parties have discussed and agreed upon the expense before it is incurred. The Employee may retain independent counsel of his choice if he is personally named in any legal action related to his employment with the Company, subject to the prior written consent of the Company, which consent shall not be unreasonably withheld. Except as required by law, or authorized in advance by the Company's General Counsel, the Employee will not communicate, directly or indirectly, with any third party, including any person or representative of any group of people or entity who is suing or has indicated that a legal action against the Company or any of its directors or officers is being contemplated, concerning the operations of the Company or the legal positions taken by the Company. Except as required by law, if asked about any such individuals or matters, the Employee shall say: "I have no comment," and shall direct the inquirer to the Company's General Counsel. The Employee acknowledges that any violation of this Section 17 will result in irreparable harm to the Company and will, in addition to other available remedies, shall be entitled to immediate injunctive relief and to an award in an amount equal to the Transition Payment paid to him as the date of such breach.

18. Non-disparagement. Except as required by law, the Employee agrees not to disparage or otherwise publish or communicate derogatory statements about the Company and any director, officer or employee and/or the products and services of the Company to any third party. Except as required by law, the Company agrees that it will direct its directors and officers not to disparage or otherwise publish or communicate derogatory statements about the Employee to any third party.
19. Clawback. Notwithstanding any other provisions in this Agreement to the contrary, any amount paid to Employee pursuant to the this Agreement or any other agreement or arrangement with the Company which is subject to recovery under any law, government regulation or stock exchange listing requirement will be subject to such deductions and clawback as may be required to be made pursuant to such law, government regulation or stock exchange listing requirement (or any policy adopted by the Company pursuant to any such law, government regulation or stock exchange listing requirement).
20. Governing Law. This Agreement shall be governed by and construed in accordance with the laws of the State of Texas, without giving effect to principles of conflict of laws.
21. Arbitration. The parties hereto agree that any future dispute of any nature whatsoever between them, including, but not limited to, any claims of statutory violations, contract or tort claims, or claims regarding any aspect of this Agreement, its formation, validity, interpretation, effect, performance or breach, or any act which allegedly has or would violate any provision of this Agreement ("Arbitrable Dispute") will be submitted to arbitration in Harris County, Texas, unless the parties agree to another location, before an experienced employment arbitrator licensed to practice law in Texas and selected in accordance with the employment arbitration rules of Judicial Arbitration and Mediation Services, Inc. ("JAMS"), unless the parties agree to a different arbitrator, as the exclusive remedy for any such Arbitrable Dispute. Should any party to this Agreement hereafter institute any legal action or administrative proceeding against the other with respect to any claim waived by this Agreement or pursue any Arbitrable Dispute by any method other than said arbitration, the responding party shall be entitled to recover from the initiating party all damages, costs, expenses and attorneys' fees incurred as a result of such action. This Section 21 shall not restrict actions for equitable relief by the Company for violation of Sections 13 through 18 of this Agreement.
22. Dispute-Related Attorneys' Fees. Except as otherwise provided herein, in any arbitration or other dispute under this Agreement, including any purported breach of this Agreement, the prevailing party shall be entitled to an award of its costs and expenses, including reasonable attorneys' fees.
23. Non-Acknowledgment of Liability. The parties understand and agree that neither the payment of any sum of money nor the execution of this Agreement by the parties will constitute or be construed as an admission of any wrongdoing or liability whatsoever by any party.

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24. **Severability.** If any one or more of the provisions contained herein (or parts thereof), or the application thereof in any circumstances, is held invalid, illegal or unenforceable in any respect for any reason, the validity and enforceability of any such provision in every other respect and of the remaining provisions hereof will not be in any way impaired or affected, it being intended that all of the rights and privileges shall be enforceable to the fullest extent permitted by law.
25. **Entire Agreement.** This Agreement represents the sole and entire agreement among the parties, and, except as expressly stated herein, supersedes all prior agreements, negotiations and discussions among the parties with respect to the subject matters contained herein, including the Employment Agreement and Transition Agreement, except as expressly provided for in the Employment Agreement and Transition Agreement or except as provided in any other agreements you have signed with the Company concerning confidential information, trade secrets or the assignment of inventions and arbitration, which shall remain in effect.
26. **Waiver.** No waiver by any party hereto at any time of any breach of, or compliance with, any condition or provision of this Agreement to be performed by any other party hereto may be deemed a waiver of similar or dissimilar provisions or conditions at the same time or at any prior or subsequent time.
27. **Amendment.** This Agreement may be modified or amended only if such modification or amendment is agreed to in writing and signed by duly authorized representatives of the parties hereto, which writing expressly states the intent of the parties to modify this Agreement.
28. **Counterparts.** This Agreement may be executed in one or more counterparts, each of which will be deemed to be an original as against any party that has signed it, but all of which together will constitute one and the same instrument.
29. **Assignment.** This Agreement inures to the benefit of and is binding upon the Company and its successors and assigns, but the Employee's rights under this Agreement are not assignable, except to his estate.
30. **Notice.** All notices, requests, demands, claims and other communications hereunder shall be in writing and shall be deemed to have been duly given (a) if personally delivered; (b) if sent by email; or (c) if mailed by overnight or by first class, certified or registered mail, postage prepaid, return receipt requested, and properly addressed as follows:

If to the Employee: Mark Andersen
[***]

If to the Company: FibroBiologics, Inc.
Attn: General Counsel
455 E. Medical Center Blvd., Suite 300
Houston, Texas 77598
[***]

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Such addresses may be changed, from time to time, by means of a notice given in the manner provided above. Notice will conclusively be deemed to have been given when personally delivered (including, but not limited to, by messenger or courier); or if given by mail, on the third day after being sent by first class, certified or registered mail; or if given by Federal Express or other similar overnight service, on the date of delivery; or if given by email during normal business hours on a business day, when confirmation of transmission is indicated by the sender's machine; or if given by email at any time other than during normal business hours on a business day, the first business day following when confirmation of transmission is indicated by the sender's machine. Notices, requests, demands and other communications delivered to legal counsel of any party hereto, whether or not such counsel shall consist of in-house or outside counsel, shall not constitute duly given notice to any party hereto.

EACH OF THE PARTIES ACKNOWLEDGES THAT HE/IT HAS READ THIS AGREEMENT, UNDERSTANDS IT AND IS VOLUNTARILY ENTERING INTO IT, AND THAT IT INCLUDES A WAIVER OF THE RIGHT TO A TRIAL BY JURY, AND, WITH RESPECT TO THE EMPLOYEE, HE

IN WITNESS WHEREOF, the parties hereto have executed this Agreement on the dates indicated below.

“Employee”

Mark Andersen

Dated: _____, 20____

“Company”

FIBROBIOLOGIS, INC.

By:

Name: _____

Title: _____

Dated : _____, 20____



October 29, 2024

Robert Hoffman
Via Email: ***

Dear Mr. Hoffman,

FibroBiologics, Inc. ("FibroBiologics") is pleased to offer you the full-time position of Interim Chief Financial Officer. The starting salary offered for this position is the gross amount of \$22,916.50 per semi-monthly pay cycle (\$45,833 full-time monthly salary, 2 pay cycles per month). Your salary will be subject to applicable taxes and deductions. Your start date is October 30, 2024.

This offer of employment is contingent upon your agreement to comply with FibroBiologics' policies as approved and revised from time to time. Noncompliance with approved policies may result in disciplinary action or termination. These policies include, but are not limited to, the following policies and agreements, both of which need to be separately executed as a condition of your employment: (i) FibroBiologics, Inc. Employment Policy Agreement, (ii) the FibroBiologics Employee Handbook, and (iii) FibroBiologics, Inc. Proprietary Information and Inventions Assignment Agreement. Your offer of employment is also contingent upon your successful completion of a background check and drug screen, and your eligibility to work in the U.S.

Your employment by FibroBiologics will be "at-will," meaning that either you or FibroBiologics have the right to terminate your employment at any time and for any reason, with or without cause. The at-will nature of your employment may be changed only in an express written agreement signed by you and an authorized officer of FibroBiologics. Nothing in this offer letter changes the at-will nature of your employment, nor does this offer letter guarantee you employment for any length of time.

On your first day of employment, additional information about FibroBiologics' objectives, policies, general employment conditions, and benefit programs will be provided. A brief summary of FibroBiologics benefits as presently construed is provided below:¹

- Health insurance, short-term disability, long-term disability, and life insurance. These benefits are provided through our Professional Employment Organization, Insperity, and an overview of these benefits are included with this offer letter.
- 401(k) retirement savings plan with up to 6% employer matching of eligible employee contributions.
- Twenty-four (24) days of personal time off (PTO) per calendar year (prorated during 2024 based on your start date). You will also be provided with up to seven (7) days of sick leave and will be provided with an additional day of PTO on your birthday. Unused PTO and sick leave will not accrue to the next calendar year, except to the extent allowed in FibroBiologics' PTO policy.
- Paid company holidays per the FibroBiologics' annual schedule (New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving (Th/Fr), Christmas Day)

¹FibroBiologics retains the discretion to change, amend or discontinue any of its employee benefit plans or programs at any time during your employment, and nothing contained in this letter obligates FibroBiologics to institute, maintain or refrain from changing, amending, or discontinuing any benefit plan or program.

455 E Medical Center Blvd, Suite 300
Houston, TX 77598



You will be required to complete the Form I-9, Employment Eligibility Verification, upon commencing employment with FibroBiologics. For a list of acceptable documents please visit <https://www.uscis.gov/i-9-central/form-i-9-acceptable-documents>. Please review this in advance because the I-9 process requires that you present acceptable documentation to confirm your identity and current work authorization. Please contact me if you have any questions about which documents are acceptable to verify your identity and eligibility to work in the United States.

We would be very pleased to have you join FibroBiologics and help us progress our critical mission. If you have any questions, please do not hesitate to contact me directly. I look forward to working with you in the future and hope you will find your employment a rewarding experience.

Sincerely,

/s/ Pete O'Heeron

Pete O'Heeron
Chief Executive Officer

Please indicate your acceptance of this employment offer by providing your signature below and returning this offer letter to me as soon as possible, but no later than October 29, 2024. Thank you.

/s/ Robert Hoffman
Employee's Signature

10/29/2024
Date

Robert Hoffman
Print Name

455 E Medical Center Blvd, Suite 300
Houston, TX 77598

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We hereby consent to the incorporation by reference in the Prospectus constituting a part of this Registration Statement on Form S-1 of our report dated February 29, 2024, relating to the financial statements of FibroBiologics, Inc. as of and for the years ended December 31, 2023 and 2022, which is incorporated by reference 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 30, 2024

Calculation of Filing Fee Tables

FORM S-1
(Form Type)FibroBiologics, Inc.
(Exact Name of Registrant as Specified in its Charter)Table 1: Newly Registered Securities

Security Type	Security Class Title	Fee Calculation Rule	Amount Registered (1)	Proposed Maximum Offering Price Per Unit	Maximum Aggregate Offering Price	Fee Rate	Amount of Registration Fee
Equity	Common stock, par value \$0.00001 per share	Rule 457(c)	4,343,220(2)	\$ 2.315(2)	\$10,054,554.30	153.10 per \$1,000,000	\$ 1,539.35
Equity	Common stock, par value \$0.00001 per share, underlying convertible promissory notes	Rule 457(c)	36,945,813(2)	\$ 2.315(2)	\$85,529,557.10	153.10 per \$1,000,000	\$ 13,094.58
Total Offering Amounts					\$95,584,111.40		\$ 14,633.93
Total Fee Offsets							—
Net Fee Due							\$ 14,633.93

(1) Pursuant to Rule 416 under the Securities Act of 1933, as amended, or the Securities Act, this Registration Statement on Form S-1 shall be deemed to cover any additional shares of common stock, par value \$0.00001 per share, or the Common Stock, of FibroBiologics, Inc. that may be issued as a result of any stock dividend, stock split, recapitalization or other similar transaction, and any other securities with respect to which the outstanding shares are converted or exchanged.

(2) Estimated solely for purposes of calculating the registration fee in accordance with Rule 457(c) under the Securities Act, based on the average of the high and low sales price of Common Stock as reported on the Nasdaq Global Market on December 27, 2024.