As filed with the Securities and Exchange Commission on September 25, 2026

Registration No. 333-

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

FORM S-3
REGISTRATION STATEMENT
UNDER
THE SECURITIES ACT OF 1933

MAIA BIOTECHNOLOGY, INC.
(Exact name of registrant as specified in its charter)

Delaware	**83-1495913**
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification Number)

444 West Lake Street, Suite 1700
Chicago, IL
(312) 416-8592
(Address, including zip code, and telephone number, including area code, of registrant's principal executive offices)

Vlad Vitoc
Chief Executive Officer
MAIA Biotechnology, Inc.
444 West Lake Street, Suite 1700
Chicago, IL
(312) 416-8592
(Name, Address, Including Zip Code, and Telephone Number, Including Area Code, of Agent For Service)

Copy to:
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Sheppard, Mullin, Richter & Hampton LLP
30 Rockefeller Plaza
New York, NY 10112-0015
Tel.: (212) 653-8700

Approximate date of commencement of proposed sale to the public: From time to time after the effective date of this registration statement.

If the only securities being registered on this Form are being offered pursuant to dividend or interest reinvestment plans, please check the following box. ☐

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, other than securities offered only in connection with dividend or interest reinvestment plans, 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 registration statement pursuant to General Instruction I.D. or a post-effective amendment thereto that shall become effective upon filing with the Commission pursuant to Rule 462(e) under the Securities Act, check the following box. ☐

If this Form is a post-effective amendment to a registration statement filed pursuant to General Instruction I.D. filed to register additional securities or additional classes of securities pursuant to Rule 413(b) under the Securities Act, check the following box. ☐

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

Large accelerated filer ☐	Accelerated filer ☐
Non-accelerated filer ☒	Smaller reporting company ☒
	Emerging growth company ☒

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

The registrant hereby amends this registration statement on such date or dates as may be necessary to delay its effective date until the registrant shall file a further amendment that specifically states that this registration statement shall thereafter become effective in accordance with Section 8(a) of the Securities Act 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 prospectus is not complete and may be changed. The selling stockholder listed herein may not sell these securities until the registration statement filed with the U.S. Securities and Exchange Commission becomes effective. This prospectus is not an offer to sell the securities and it is not soliciting an offer to buy the securities in any state where offers or sales are not permitted.

PRELIMINARY PROSPECTUS
Subject to completion, dated September 25, 2026

MAIA BIOTECHNOLOGY

751,879 Shares of Common Stock

Pursuant to this prospectus, the selling stockholder identified herein (the "Selling Stockholder") is offering on a resale basis an aggregate of 751,879 shares (the "Shares") of common stock, par value $0.0001 per share (the "Common Stock") of MAIA Biotechnology, Inc., (the "Company," "we," "us" or "our") received under our Clinical Trial Funding Agreement dated August 29, 2026 with PoC Capital, LLC.

We will not receive any of the proceeds from the sale by the Selling Stockholder of the Common Stock.

This prospectus describes the general manner in which the Shares may be offered and sold. If necessary, the specific manner in which the Shares may be offered and sold will be described in a supplement to this prospectus. The Shares were each issued to the Selling Stockholder in connection with a private placement offering pursuant to Section 4(a)(2) of the Securities Act of 1933, as amended (the "Securities Act"), and/or Regulation D promulgated thereunder.

The Shares will be resold from time to time by the Selling Stockholder listed in the section titled "Selling Stockholder" beginning on page 5.

The Selling Stockholder, or its transferees, pledgees, donees or other successors-in-interest, will sell the Shares through public or private transactions at prevailing market prices, at prices related to prevailing market prices or at privately negotiated prices. The Selling Stockholder may sell any, all or none of the securities offered by this prospectus, and we do not know when or in what amount the Selling Stockholder may sell its Shares hereunder following the effective date of this registration statement. We provide more information about how a Selling Stockholder may sell its Shares in the section titled "Plan of Distribution" on page 8.

Our Common Stock is listed on the NYSE American under the symbol "MAIA". On September 22, 2026, the closing price as reported on the NYSE American was $1.37 per share.

Investing in our Common Stock involves a high degree of risk. See "Risk Factors" beginning on page 3 of this prospectus.

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.

The date of this prospectus is , 2026

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You should rely only on the information provided in this prospectus, as well as the information incorporated by reference into this prospectus and any applicable prospectus supplement. Neither we nor the Selling Stockholder have authorized anyone to provide you with different information. Neither we nor the Selling Stockholder are making an offer of these securities in any jurisdiction where the offer is not permitted. You should not assume that the information in this prospectus, any applicable prospectus supplement or any documents incorporated by reference is accurate as of any date other than the date of the applicable document. Since the respective dates of this prospectus and the documents incorporated by reference into this prospectus, our business, financial condition, results of operations and prospects may have changed.

SUMMARY

The following summary highlights selected information contained elsewhere in this prospectus and in the documents incorporated by reference herein. It does not contain all the information that may be important to you and your investment decision. You should carefully read this entire prospectus, including the matters set forth under "Risk Factors," the information included in any free writing prospectus that we have authorized for use in connection with this offering, and the documents incorporated by reference herein. Some of the statements in this prospectus constitute forward-looking statements. See "Cautionary Note Regarding Forward-Looking Statements."

Overview

We are a clinical-stage biopharmaceutical company developing targeted immunotherapies for cancer. Ateganosine (also known as THIO, 6-thio-dG or 6-thio-2 '-deoxyguanosine), our lead asset, is an investigational dual mechanism of action drug candidate incorporating telomere targeting and immunogenicity. Our initial disease target is lung cancer, a serious medical condition with an incidence of over 235,000 new cases in the US in 2024, representing 12% of all cancers, and over 125,000 deaths, or 20% of all cancers. Worldwide, lung cancer incidence is over 2,200,000 per year (ranking second only after breast cancer), and mortality over 1,800,000 (ranking first). Specifically, we are targeting Non-Small Cell Lung Cancer ("NSCLC"), which represents 85% of all lung cancers. In July 2022, the first patient was administered with ateganosine in our Phase 2 human trial (THIO-101) in Australia. In December 2022, regulatory authorities in three European countries, Hungary, Poland, and Bulgaria, approved the implementation of THIO-101, Phase 2 clinical trial evaluating ateganosine in patients with NSCLC. Patients with advanced NSCLC will be treated first with ateganosine followed a few days later by the immune checkpoint inhibitor Libtayo® (cemiplimab), manufactured and commercialized by Regeneron. Cemiplimab is a fully human monoclonal antibody targeting the immune checkpoint receptor PD-1 on T-cells. Cemiplimab has been approved in the United States and the rest of the world for multiple cancer indications, including NSCLC. In February 2021, we signed a clinical supply agreement with Regeneron to receive cemiplimab at no cost, which represents a significant cost-savings for the study. In return, we have granted Regeneron exclusive development rights in combination with PD-1 inhibitors for NSCLC for the study period. Based on the clinical data generated by our THIO-101 trial, we plan to seek filing for an accelerated approval of ateganosine in the United States for the treatment of patients with advanced NSCLC in 2026, but even if granted, accelerated approval status does not guarantee an accelerated review or marketing approval by the Food and Drug Administration (FDA). We initiated a Phase 3 pivotal trial in 2025, named THIO-104, to evaluate the efficacy of ateganosine administered in sequence with a checkpoint inhibitor (CPI) in third-line NSCLC patients who are resistant to checkpoint inhibitors and chemotherapy which could lead filing for early full commercial approval in 2027 and final analysis could lead to filing for full commercial approval in 2028. The multicenter, open-label, pivotal Phase 3 trial is designed to provide a direct comparison to chemotherapy in a 1:1 randomization of up to 300 patients. In addition, the originally planned Phase 2 clinical trial in multiple tumor indications (THIO-102) is now divided into different trials for one tumor indication each: hepatocellular carcinoma (HCC), colorectal cancer (CRC) and small cell lung cancer (SCLC). In December 2024, we entered into a clinical supply agreement with global oncology company BeOne Medicines to assess the efficacy of ateganosine in combination with BeOne's immune checkpoint inhibitor (CPI) tislelizumab in three cancer indications across different trials to study the drug combination in HCC, SCLC and CRC. Phase 2 clinical trials in HCC, CRC and SCLC are planned to be initiated in 2026, evaluating treatment with ateganosine administered in sequence with BeOne's immune checkpoint inhibitor, tislelizumab. In June 2025, MAIA announced its entry into a clinical master supply agreement with Roche for future studies investigating the combination of ateganosine sequenced with Roche's checkpoint inhibitor (CPI), atezolizumab (Tecentriq®), for the treatment of multiple cancers indications. Clinical trials with other solid tumors (ST), such as breast, prostate, gastric, pancreatic and ovarian, may still be considered for potential future trials.

We were incorporated in Delaware in August 2018, and have operations in Chicago, Illinois, with some of our team members setup virtually and working remotely in California, North Carolina, and New Jersey, among others. Our principal executive office is located at 444 West Lake Street, Suite 1700, Chicago, IL 60606, and our phone number is (312) 416-8592. In July 2021, we established a wholly-owned Australian subsidiary, MAIA Biotechnology Australia Pty Ltd., to conduct various preclinical and clinical activities for the development of our product candidates. ln April 2022, we established a wholly owned Romanian subsidiary, MAIA Biotechnology Romania S.R.L. to conduct various preclinical and clinical activities for the development of our product candidates. Our website address is www.MAIABiotech.com. The information contained on our website is not incorporated by reference into this prospectus supplement, and you should not consider any information contained on, or that can be accessed through, our website as part of this prospectus supplement or in deciding whether to purchase our securities.

Implications of Being a Smaller Reporting Company

We are a "smaller reporting company" as defined in Rule 12b-2 of the Exchange Act and we may take advantage of certain of the scaled disclosures available to smaller reporting companies. We will be able to take advantage of these scaled disclosures for so long as our stock held by non-affiliates is less than $250 million measured on the last business day of our second fiscal quarter, or our annual revenue is less than $100 million during the most recently completed fiscal year and our common stock held by non-affiliates is less than $700 million measured on the last business day of our second fiscal quarter.

Corporate Information

We were incorporated in Delaware in August 2018, and we have operations in Chicago, Illinois, with some of our team members setup virtually and working remotely in California, Oregon, Massachusetts, Iowa, Ohio, Texas, North Carolina, and New Jersey. Our principal executive office is located at 444 West Lake Street, Suite 1700, Chicago, IL 60606, and our phone number is (312) 416-8592. In July 2021, we established a wholly owned Australian subsidiary, MAIA Biotechnology Australia Pty Ltd, to conduct various preclinical and clinical activities for the development of our product candidates. In April 2022, we established a wholly owned Romanian subsidiary, MAIA Biotechnology Romania S.R.L. to conduct various preclinical and clinical activities for the development of our product candidates. Our website address is *www.MAIABiotech.com*. The information contained on our website is not incorporated by reference into this prospectus, and you should not consider any information contained on, or that can be accessed through, our website as part of this prospectus or in deciding whether to purchase our common stock.

ABOUT THIS OFFERING

Issuer:	MAIA Biotechnology, Inc.
Shares offered by the Selling Stockholder:	751,879 shares of Common Stock.
Shares of Common Stock outstanding after completion of this offering:	61,741,946 shares[(1)]
Use of proceeds:	We will not receive any of the proceeds from the sale by the Selling Stockholder of the Common Stock. However, the Selling Stockholder has agreed to provide $1,000,000 in funding (the "Funding Amount") following the date of this prospectus, which Funding Amount will be applied towards the payment of expenses incurred by the Company from time to time in connection with its studies to evaluate the safety, tolerability, efficacy and pharmacodynamics of THIO in patients with cancer. See "Use of Proceeds."
Risk factors:	An investment in the shares of Common Stock offered under this prospectus is highly speculative and involves substantial risk. Please carefully consider the "Risk Factors" section on page 3, other information in this prospectus and in the documents incorporated by reference herein for a discussion of risks. Additional risks and uncertainties not presently known to us or that we currently deem to be immaterial may also impair our business and operations.
NYSE American symbol:	MAIA

(1) The number of shares of Common Stock to be outstanding immediately after this offering is based on 61,741,946 shares of Common Stock outstanding as of September 25, 2026, and excludes, as of such date:

- 16,742,806 shares of Common Stock issuable upon exercise of options outstanding under the MAIA Biotechnology, Inc. 2021 Equity Incentive Plan, as amended (the "2021 Plan") with a weighted-average exercise price of $2.00 per share;
- 3,004,138 shares of Common Stock reserved for future issuance under the 2021 Plan; and
- 13,086,220 shares of Common Stock issuable upon the exercise of warrants outstanding at a weighted average exercise price of $1.92 per share.

RISK FACTORS

Any investment in our Common Stock involves a high degree of risk. Before deciding whether to purchase our Common Stock, investors should carefully consider the risks described below together with the "Risk Factors" described in our most recent Annual Report on Form 10-K and any updates described in our Quarterly Reports on Form 10-Q and Current Reports on Form 8-K, all of which are incorporated herein by reference, as may be amended, supplemented or superseded from time to time by other reports we file with the U.S. Securities and Exchange Commission (the "SEC"). Our business, financial condition, operating results and prospects are subject to the following material risks as well as those material risks incorporated by reference. Additional risks and uncertainties not presently foreseeable to us may also impair our business operations. If any of the following risks actually occurs, our business, financial condition or operating results could be materially adversely affected. In such case, the trading price of our Common Stock could decline, and our shareholders may lose all or part of their investment in the shares of our common stock.

Risks Related to the Resale of the Shares

The Selling Stockholder may choose to sell the Shares at prices below the current market price.

The Selling Stockholder is not restricted as to the prices at which they may sell or otherwise dispose of the Shares covered by this prospectus. Sales or other dispositions of the Shares below the then-current market prices could adversely affect the market price of our Common Stock.

The shares of Common Stock being registered hereunder may be sold in the market following this offering, which may significantly depress the market price of our Common Stock.

The Shares sold in the offering will be freely tradable without restriction or further registration under the Securities Act. As a result, the 751,879 Shares may be sold in the public market following this offering. If there are significantly more shares of Common Stock offered for sale than buyers are willing to purchase, then the market price of our Common Stock may decline to a market price at which buyers are willing to purchase the offered Common Stock and sellers remain willing to sell Common Stock.

Neither we nor the Selling Stockholder have authorized any other party to provide you with information concerning us or this offering.

You should carefully evaluate all of the information in this prospectus, including the documents incorporated by reference herein and therein. We may receive media coverage regarding our Company, including coverage that is not directly attributable to statements made by our officers, that incorrectly reports on statements made by our officers or employees, or that is misleading as a result of omitting information provided by us, our officers or employees. Neither we nor the Selling Stockholder have authorized any other party to provide you with information concerning us or this offering, and recipients should not rely on this information.

You may experience future dilution as a result of issuance of the Shares, future equity offerings by us and other issuances of our Common Stock or other securities. In addition, the issuance of the Shares and future equity offerings and other issuances of our Common Stock or other securities may adversely affect our Common Stock price.

In order to raise additional capital, we may in the future offer additional shares of our Common Stock or other securities convertible into or exchangeable for our Common Stock at prices that may not be the same as the price per share as prior issuances of Common Stock. We may not be able to sell shares or other securities in any other offering at a price per share that is equal to or greater than the price per share previously paid by investors, and investors purchasing shares or other securities in the future could have rights superior to existing stockholders. The price per share at which we sell additional shares of our Common Stock or securities convertible into Common Stock in future transactions may be higher or lower than the prices per share. You will incur dilution upon exercise of any outstanding stock options, warrants or upon the issuance of shares of Common Stock under our stock incentive programs. In addition, the issuance of the Shares and any future sales of a substantial number of shares of our Common Stock in the public market, or the perception that such sales may occur, could adversely affect the price of our Common Stock. We cannot predict the effect, if any, that market sales of those shares of Common Stock or the availability of those shares for sale will have on the market price of our Common Stock.

CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus and the documents incorporated by reference contain forward-looking statements that involve risks and uncertainties. You should not place undue reliance on these forward-looking statements. All statements other than statements of historical facts contained in this prospectus and the documents incorporated by reference are forward-looking statements. The forward-looking statements in this prospectus and the documents incorporated by reference are only predictions. In some cases, you can identify these forward-looking statements by terms such as "anticipate," "believe," "continue," "could," "depends," "estimate," "expects," "intend," "may," "ongoing," "plan," "potential," "predict," "project," "should," "will," "would" or the negative of those terms or other similar expressions, although not all forward-looking statements contain those words. Our forward-looking statements are based on a series of expectations, assumptions, estimates and projections about our Company, are not guarantees of future results or performance and involve substantial risks and uncertainty. They involve known and unknown risks, uncertainties and assumptions that may cause actual results, levels of activity, performance or achievements to differ materially from any results, levels of activity, performance or achievements expressed or implied by any forward-looking statement. We may not actually achieve the plans, intentions or expectations disclosed in these forward-looking statements. Our business and our forward-looking statements involve substantial known and unknown risks and uncertainties, including the risks and uncertainties inherent in our statements regarding:

- our financial performance;
- there is substantial doubt regarding our ability to continue as a going concern. We will need substantial additional funding, which may not be available on acceptable terms, or at all. Failure to obtain this necessary capital when needed may force us to delay, limit or terminate our product development efforts or other operations;
- our ability to obtain funding for our operations, including funding necessary to develop and commercialize our drug candidates;
- the ability to receive FDA clearance for clinical trials;
- the ability to secure clinical sites, enroll patients, and initiate clinical trials;
- the ability of our clinical trials to demonstrate safety and efficacy of our drug candidates, and other positive results;
- the success, cost and timing of our development activities, preclinical studies and clinical trials;
- the timing and focus of our future clinical trials, and the reporting of data from those trials;
- our plans relating to commercializing our drug candidates, if approved;
- our plans and ability to establish sales, marketing and distribution infrastructure to commercialize any drug candidates for which we obtain approval;
- our ability to attract and retain key scientific and clinical personnel;
- our ability to contract with third-party suppliers and manufacturers and their ability to perform adequately;
- our reliance on third parties to conduct clinical trials of our drug candidates, and for the manufacture of our drug candidates for preclinical studies and clinical trials;
- our ability to establish our own manufacturing facilities domestically;
- our ability to expand our drug candidates into additional indications and patient populations;
- the success of competing therapies that are or may become available;
- the beneficial characteristics, safety and efficacy of our drug candidates;
- regulatory developments in the United States and other jurisdictions;
- our ability to obtain and maintain regulatory approval of our drug candidates, and any related restrictions, limitations and/or warnings in the label of any approved drug candidate;
- our plans relating to the further development and manufacturing of our drug candidates, including additional indications for which we may pursue;
- our plans and ability to obtain or protect intellectual property rights;
- the scope of protection we are able to establish and maintain for intellectual property rights covering our drug candidates and technology; and
- potential claims relating to our intellectual property.

Although we believe that we have a reasonable basis for each forward-looking statement contained in this prospectus supplement, the accompanying prospectus, and the other documents we have filed with the SEC that are incorporated by reference herein, we caution you that these statements are based on our projections of the future that are subject to known and unknown risks and uncertainties and other factors that may cause our actual results, level of activity, performance or achievements expressed or implied by these forward-looking statements, to differ. We may not actually achieve the plans, intentions or expectations disclosed in our forward-looking statements, and you should not place undue reliance on our forward-looking statements. All forward-looking statements are qualified in their entirety by this cautionary statement. Forward-looking statements should be regarded solely as our current plans, estimates and beliefs. We have included important factors in the cautionary statements included in this prospectus supplement, the accompanying prospectus, and the other documents we have filed with the SEC that are incorporated by reference herein, particularly in the section entitled "Risk Factors," beginning on page 3 of this prospectus supplement, which we believe could cause our actual results to be materially different from the plans, intentions and expectations disclosed in the forward-looking statements we make. Moreover, we operate in a very competitive and rapidly changing environment. New risks emerge from time to time. It is not possible for our management to predict all risks, nor can we assess the impact of all factors on our business or the extent to which any factor, or combination of factors, may cause actual results to differ materially from those contained in any forward-looking statements we may make.

USE OF PROCEEDS

We will not receive any of the proceeds from the sale by the Selling Stockholder of the Common Stock. However, the Selling Stockholder has agreed to provide $1,000,000 in funding (the "Funding Amount") following the date of this prospectus, which Funding Amount will be applied towards the payment of expenses incurred by the Company from time to time in connection with its studies to evaluate the safety, tolerability, efficacy and pharmacodynamics of THIO in patients with cancer.

SELLING STOCKHOLDER

The Shares being offered by the Selling Stockholder are the shares of our Common Stock received under a Clinical Trial Funding Agreement. We are registering the Shares in order to permit the Selling Stockholder to offer such shares for resale from time to time. Except as set forth below, the Selling Stockholder has not had any material relationship with us within the past three (3) years except as set forth below.

The following table sets forth certain information with respect to the Selling Stockholder, including (i) the shares of Common Stock beneficially owned by the Selling Stockholder prior to this offering, (ii) the number of Shares, being offered by the Selling Stockholder pursuant to this prospectus and (iii) the Selling Stockholder's beneficial ownership after completion of this offering. The second column lists the number of shares of Common Stock beneficially owned by each selling stockholder, based on its ownership of the shares of our securities, as of September 25, 2026. The registration of the Shares does not necessarily mean that the Selling Stockholder will sell all or any of such shares, but the number of shares of Common Stock and percentages set forth in the final two columns below assume that all shares of Common Stock being offered by the Selling Stockholder are sold.

The table is based on information supplied to us by the Selling Stockholder, with beneficial ownership and percentage ownership determined in accordance with the rules and regulations of the SEC and includes voting or investment power with respect to shares of Common Stock. This information does not necessarily indicate beneficial ownership for any other purpose. In computing the number of shares of Common Stock beneficially owned by the Selling Stockholder and the percentage ownership of the Selling Stockholder, shares of Common Stock subject to warrants held by that Selling Stockholder that are exercisable for shares of Common Stock within 60 days after September 25, 2026, are deemed outstanding. Such shares, however, are not deemed outstanding for the purposes of computing the percentage ownership of any other stockholder. The Selling Stockholder may sell all, some or none of its shares in this offering. See "Plan of Distribution."

This prospectus covers the resale of 751,879 shares of Common Stock.

Name and address of Selling Stockholder	Number of Shares of Common Stock Beneficially Owned Prior to Offering	Maximum Number of Shares of Common Stock to be Sold Pursuant to this Prospectus	Number of Shares of Common Stock Beneficially Owned After Offering[1]	Percent of Common Stock Beneficially Owned After Offering[2]
PoC Capital LLC.[3]	760,451	751,879	8,572	*

* less than 1%

(1) Assumes that the Selling Stockholder has sold all the shares of our Common Stock offered for sale under this Prospectus.

(2) Calculated based on 61,741,946 shares of Common Stock outstanding as of September 25, 2026 assuming all shares offered are sold.

(3) Daron Evans, Managing Director of the Selling Stockholder is the natural person with voting and investment control over these shares. The address is 255A Glenwood Ave., Woodside, CA 94062.

DESCRIPTION OF SECURITIES TO BE REGISTERED

General

Our authorized capital stock consists of 150,000,000 shares of common stock, $0.0001 par value per share, and 30,000,000 shares of preferred stock, $0.0001 par value per share, all of which remain undesignated. As of September 25, 2026, there were 61,741,946 shares of common stock issued and outstanding and no shares of preferred stock issued and outstanding. The following description of our capital stock and provisions of our Amended and Restated Certificate of Incorporation and Amended and Restated Bylaws is only a summary. This description is summarized from, and qualified in its entirety by reference to, our Amended and Restated Certificate of Incorporation and Amended and Restated Bylaws which are incorporated by reference into the registration statement of which this prospectus is a part.

Common Stock

As of September 25, 2026, there were 61,741,946 shares of our common stock outstanding and held by approximately 165 stockholders of record.

Holders of our common stock are entitled to one vote per share on all matters voted on by our shareholders, including the election of directors. Our Certificate of Incorporation and Bylaws do not provide for cumulative voting in the election of directors. Holders of our common stock are entitled, subject to the rights, privileges, restrictions and conditions attaching to any other class of shares ranking in priority to our common stock, to receive any dividend declared by our board of directors. If we are voluntarily or involuntarily liquidated, dissolved or wound-up, the holders of our common stock will be entitled to receive, after distribution in full of the preferential amounts, if any, all of the remaining assets available for distribution ratably in proportion to the number of shares of our common stock held by them.

We have never paid or declared any cash dividends on our common stock, and we do not anticipate paying any cash dividends on our common stock in the foreseeable future. We currently anticipate that we will retain future earnings for the development, operation and expansion of our business. Any future determination to pay dividends will be at the discretion of our board of directors and will depend upon a number of factors, including our results of operations, financial condition, future prospects, contractual restrictions, restrictions imposed by applicable law and other factors that our board of directors deems relevant. For a discussion of provisions in our charter that would have an effect of delaying or preventing a change of control, see “Anti-Takeover Effects of Provisions of Our Charter Documents.”

Transfer Agent and Registrar

Our stock transfer agent and registrar is Computershare Trust Company, N.A., and its address is 6200 S. Quebec St. Greenwood Village, CO 80111.

Anti-takeover Effects of Delaware Law and our Certificate of Incorporation

Some provisions of Delaware law, our certificate of incorporation and our bylaws contain provisions that delay, defer, or discourage transactions involving an actual or potential change in control of us or change in our management. It is possible that these provisions could make it more difficult to accomplish or could deter transactions that stockholders may otherwise consider to be in their best interest or in our best interests, including transactions which provide for payment of a premium over the market price for our shares. These provisions, summarized below, are intended to discourage coercive takeover practices and inadequate takeover bids. These provisions are also designed to encourage persons seeking to acquire control of us to first negotiate with our board of directors. We believe that the benefits of the increased protection of our potential ability to negotiate with the proponent of an unfriendly or unsolicited proposal to acquire or restructure us outweigh the disadvantages of discouraging these proposals because negotiation of these proposals could result in an improvement of their terms.

Authorized but Unissued Shares

Our authorized but unissued shares of common stock and preferred stock are available for future issuance without stockholder approval. These additional shares may be utilized for a variety of corporate purposes, including future public offerings to raise additional capital and corporate acquisitions. The existence of authorized but unissued shares of common stock and preferred stock could render more difficult or discourage an attempt to obtain control of a majority of our common stock by means of a proxy contest, tender offer, merger or otherwise.

Stockholder Meetings

Any action to be taken by our stockholders must be effected at a duly called annual or special meeting of stockholders and not be taken by written consent.

Requirements for Advance Notification of Stockholder Nominations and Proposals

Stockholders seeking to present proposals before a meeting of stockholders or to nominate candidates for election as directors at a meeting of stockholders must provide advance notice in writing, and also specify requirements as to the form and content of a stockholder's notice.

Delaware Anti-Takeover Statute

We are subject to Section 203 of the Delaware's General Corporation Law (DGCL), which prohibits persons deemed to be "interested stockholders" from engaging in a "business combination" with a publicly held Delaware corporation for three years following the date these persons become interested stockholders unless the business combination is, or the transaction in which the person became an interested stockholder was, approved in a prescribed manner or another prescribed exception applies. Generally, an "interested stockholder" is a person who, together with affiliates and associates, owns, or within three years prior to the determination of interested stockholder status did own, 15% or more of a corporation's voting stock. Generally, a "business combination" includes a merger, asset or stock sale, or other transaction resulting in a financial benefit to the interested stockholder. The existence of this provision may have an anti-takeover effect with respect to transactions not approved in advance by the board of directors.

Choice of Forum

The Court of Chancery of the State of Delaware is the exclusive forum in which we and our directors may be sued by our stockholders, to the fullest extent permitted by law, for: any derivative action or proceeding brought on our behalf; any action asserting a breach of fiduciary duty; any action asserting a claim against us arising pursuant to the DGCL, our certificate of incorporation, or our bylaws; or any action asserting a claim against us that is governed by the internal affairs doctrine. Our bylaws will not apply to suits brought to enforce a duty or liability created by the Securities Act or the Exchange Act, or any other claim for which federal courts have exclusive jurisdiction. Section 22 of the Securities Act of 1933, as amended (the "Securities Act") creates concurrent jurisdiction.

National Securities Exchange Listing

Our common stock is listed on NYSE American, or the "NYSE American," under the symbol "MAIA."

PLAN OF DISTRIBUTION

The Selling Stockholder of the securities and any of their pledgees, assignees and successors-in-interest may, from time to time, sell any or all of their securities covered hereby on the principal Trading Market or any other stock exchange, market or trading facility on which the securities are traded or in private transactions. These sales may be at fixed or negotiated prices. The Selling Stockholder may use any one or more of the following methods when selling securities:

- ordinary brokerage transactions and transactions in which the broker-dealer solicits purchasers;
- block trades in which the broker-dealer will attempt to sell the securities as agent but may position and resell a portion of the block as principal to facilitate the transaction;
- purchases by a broker-dealer as principal and resale by the broker-dealer for its account;
- an exchange distribution in accordance with the rules of the applicable exchange;
- privately negotiated transactions;
- settlement of short sales;
- in transactions through broker-dealers that agree with the Selling Stockholder to sell a specified number of such securities at a stipulated price per security;
- through the writing or settlement of options or other hedging transactions, whether through an options exchange or otherwise;
- a combination of any such methods of sale; or
- any other method permitted pursuant to applicable law.

The Selling Stockholder may also sell securities under Rule 144 or any other exemption from registration under the Securities Act of 1933, as amended (the "Securities Act"), if available, rather than under this prospectus.

Broker-dealers engaged by the Selling Stockholder may arrange for other brokers-dealers to participate in sales. Broker-dealers may receive commissions or discounts from the Selling Stockholder (or, if any broker-dealer acts as agent for the purchaser of securities, from the purchaser) in amounts to be negotiated, but, except as set forth in a supplement to this prospectus, in the case of an agency transaction not in excess of a customary brokerage commission in compliance with FINRA Rule 2121; and in the case of a principal transaction a markup or markdown in compliance with FINRA Rule 2121.

In connection with the sale of the securities or interests therein, the Selling Stockholder may enter into hedging transactions with broker-dealers or other financial institutions, which may in turn engage in short sales of the securities in the course of hedging the positions they assume. The Selling Stockholder may also sell securities short and deliver these securities to close out their short positions, or loan or pledge the securities to broker-dealers that in turn may sell these securities. The Selling Stockholder may also enter into option or other transactions with broker-dealers or other financial institutions or create one or more derivative securities which require the delivery to such broker-dealer or other financial institution of securities offered by this prospectus, which securities such broker-dealer or other financial institution may resell pursuant to this prospectus (as supplemented or amended to reflect such transaction).

The Selling Stockholder and any broker-dealers or agents that are involved in selling the securities may be deemed to be "underwriters" within the meaning of the Securities Act in connection with such sales. In such event, any commissions received by such broker-dealers or agents and any profit on the resale of the securities purchased by them may be deemed to be underwriting commissions or discounts under the Securities Act. The Selling Stockholder has informed the Company that it does not have any written or oral agreement or understanding, directly or indirectly, with any person to distribute the securities.

The Company is required to pay certain fees and expenses incurred by the Company incident to the registration of the securities. The Company has agreed to indemnify the Selling Stockholder against certain losses, claims, damages and liabilities, including liabilities under the Securities Act.

We agreed to keep this prospectus effective until the earlier of (i) the date on which the securities may be resold by the Selling Stockholder without registration and without regard to any volume or manner-of-sale limitations by reason of Rule 144, without the requirement for the Company to be in compliance with the current public information under Rule 144 under the Securities Act or any other rule of similar effect or (ii) all of the securities have been sold pursuant to this prospectus or Rule 144 under the Securities Act or any other rule of similar effect. The resale securities will be sold only through registered or licensed brokers or dealers if required under applicable state securities laws. In addition, in certain states, the resale securities covered hereby may not be sold unless they have been registered or qualified for sale in the applicable state or an exemption from the registration or qualification requirement is available and is complied with.

Under applicable rules and regulations under the Exchange Act, any person engaged in the distribution of the resale securities may not simultaneously engage in market making activities with respect to the common stock for the applicable restricted period, as defined in Regulation M, prior to the commencement of the distribution. In addition, the Selling Stockholder will be subject to applicable provisions of the Exchange Act and the rules and regulations thereunder, including Regulation M, which may limit the timing of purchases and sales of the common stock by the Selling Stockholder or any other person. We will make copies of this prospectus available to the Selling Stockholder and have informed them of the need to deliver a copy of this prospectus to each purchaser at or prior to the time of the sale (including by compliance with Rule 172 under the Securities Act).

LEGAL MATTERS

The validity of the issuance of the securities offered hereby will be passed upon for us by Sheppard, Mullin, Richter & Hampton LLP, New York, New York. Additional legal matters may be passed upon for us or any underwriters, dealers, or agents by counsel that we will name in the applicable prospectus supplement.

EXPERTS

The consolidated financial statements as of and for the years ended December 31, 2025 and 2024, incorporated by reference in this prospectus and elsewhere in the registration statement have been so incorporated by reference in reliance upon the reports of Grant Thornton LLP, independent registered public accountants, upon the authority of said firm as experts in accounting and auditing.

WHERE YOU CAN FIND MORE INFORMATION

This prospectus constitutes a part of the registration statement on Form S-3 that we have filed with the SEC under the Securities Act. As permitted by the SEC's rules, this prospectus and any accompanying prospectus supplement, which forms a part of the registration statement, do not contain all of the information that is included in the registration statement. You will find additional information about us in the registration statement. Any statement made in this prospectus or any accompanying prospectus supplement concerning legal documents are not necessarily complete and you should read the documents that are filed as exhibits to the registration statement or otherwise filed with the SEC for a more complete understanding of the document or matter.

We are subject to the reporting requirements of the Exchange Act and file annual, quarterly and current reports, proxy statements and other information with the SEC. You can read our SEC filings, including the registration statement, over the internet at the SEC's website at *http://www.sec.gov*. We also maintain a website at *www.MAIABiotech.com*, at which you may access these materials free of charge as soon as reasonably practicable after they are electronically filed with, or furnished to, the SEC. The information contained in, or that can be accessed through, our website is not part of this prospectus. You may also request a copy of these filings, at no cost, by writing or telephoning us at: MAIA Biotechnology, Inc., 444 West Lake Street, Suite 1700, Chicago, IL 60606, (312) 416-8592.

INCORPORATION OF DOCUMENTS BY REFERENCE

This prospectus is part of the registration statement, but the registration statement includes and incorporates by reference additional information and exhibits. The SEC permits us to "incorporate by reference" the information contained in documents we file with the SEC, which means that we can disclose important information to you by referring you to those documents rather than by including them in this prospectus. Information that is incorporated by reference is considered to be part of this prospectus and you should read it with the same care that you read this prospectus and any subsequent prospectus supplement. Information that we file later with the SEC will automatically update and supersede the information that is either contained, or incorporated by reference, in this prospectus, and will be considered to be a part of this prospectus from the date those documents are filed.

We incorporate by reference the documents listed below, all filings filed by us pursuant to the Securities Exchange Act of 1934, as amended (the "Exchange Act"), after the date of the registration statement of which this prospectus, and any future filings we make with the SEC under Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act prior to the time that all securities covered by this prospectus have been sold; provided, however, that we are not incorporating any information furnished under either Item 2.02 or Item 7.01 of any Current Report on Form 8-K and exhibits furnished on such form that relate to such items:

- our Annual Report on Form 10-K for the year ended December 31, 2025 filed with the SEC on March 23, 2026;
- our Quarterly Reports on Form 10-Q for the quarters ended March 31, 2026, and June 30, 2026 filed with the SEC on May 11, 2026, and August 10, 2026, respectively;
- our Current Reports on Form 8-K filed with the SEC on January 13, 2026, January 20, 2026, February 24, 2026, March 4, 2026, March 27, 2026, March 31, 2026, April 2, 2026, April 8, 2026, April 16, 2026, May 14, 2026, and May 22, 2026; and
- The description of our common stock and preferred stock filed as Exhibit 4.1 to our Annual Report on Form 10-K for the fiscal year ended December 31, 2025 filed with the SEC on March 23, 2026.

Any statements made in a document incorporated by reference in this prospectus are deemed to be modified or superseded for purposes of this prospectus to the extent that a statement in this prospectus or in any other subsequently filed document, which is also incorporated by reference, modifies or supersedes the statement. Any statement made in this prospectus is deemed to be modified or superseded to the extent a statement in any subsequently filed document, which is incorporated by reference in this prospectus, modifies or supersedes such statement. Any statement so modified or superseded will not be deemed, except as so modified or superseded, to constitute a part of this prospectus.

The information relating to us contained in this prospectus should be read together with the information in the documents incorporated by reference. In addition, certain information, including financial information, contained in this prospectus or incorporated by reference in this prospectus should be read in conjunction with documents we have filed with the SEC.

We will provide to each person, including any beneficial holder, to whom a prospectus is delivered, at no cost, upon written or oral request, a copy of any or all of the information that has been incorporated by reference in the prospectus but not delivered with the prospectus. Requests for documents should be by writing to or telephoning us at the following address: MAIA Biotechnology, Inc., 444 West Lake Street, Suite 1700, Chicago, IL 60606, (312) 416-8592. Exhibits to these filings will not be sent unless those exhibits have been specifically incorporated by reference in such filings.

751,879 Shares of Common Stock

PROSPECTUS

, 2026

PART II
INFORMATION NOT REQUIRED IN PROSPECTUS

Item 14. Other Expenses of Issuance and Distribution.

The following table sets forth an estimate of the fees and expenses relating to the issuance and distribution of the securities being registered hereby, other than underwriting discounts and commissions, all of which shall be borne by the Company. All of such fees and expenses, except for the SEC Registration Fee, are estimated:

SEC registration fee	$	138.10
Legal fees and expenses	$	15,000
Printing fees and expenses	$	1,500
Accounting fees and expenses	$	2,500
Miscellaneous fees and expenses	$	861.90
Total	$	20,000.00

Item 15. Indemnification of Directors and Officers

Section 102 of the DGCL permits a corporation to eliminate the personal liability of the directors of a corporation to the corporation or its stockholders for monetary damages for a breach of fiduciary duty as a director, except where the director breached his duty of loyalty, failed to act in good faith, engaged in intentional misconduct or knowingly violated a law, authorized the payment of a dividend or approved a stock repurchase in violation of Delaware corporate law or obtained an improper personal benefit. Our amended and restated certificate of incorporation provides that no director of the registrant shall be personally liable to it or its stockholders for monetary damages for any breach of fiduciary duty as a director, notwithstanding any provision of law imposing such liability, except to the extent that the DGCL prohibits the elimination or limitation of liability of directors for breaches of fiduciary duty.

Section 145 of the DGCL provides that a corporation has the power to indemnify a director, officer, employee, or agent of the corporation, or a person serving at the request of the corporation for another corporation, partnership, joint venture, trust or other enterprise in related capacities against expenses (including attorneys' fees), judgments, fines and amounts paid in settlement actually and reasonably incurred by the person in connection with an action, suit or proceeding to which he was or is a party or is threatened to be made a party to any threatened, pending or completed action, suit or proceeding by reason of such position, if such person acted in good faith and in a manner he reasonably believed to be in or not opposed to the best interests of the corporation, and, in any criminal action or proceeding, had no reasonable cause to believe his conduct was unlawful, except that, in the case of actions brought by or in the right of the corporation, no indemnification shall be made with respect to any claim, issue or matter as to which such person shall have been adjudged to be liable to the corporation unless and only to the extent that the Court of Chancery or other adjudicating court determines that, despite the adjudication of liability but in view of all of the circumstances of the case, such person is fairly and reasonably entitled to indemnity for such expenses which the Court of Chancery or such other court shall deem proper.

Our amended and restated bylaws authorize the indemnification of our officers and directors, consistent with Section 145 of the DGCL, as amended. Reference is made to Section 102(b)(7) of the DGCL, which enables a corporation in its original certificate of incorporation or an amendment thereto to eliminate or limit the personal liability of a director for violations of the director's fiduciary duty, except (i) for any breach of the director's duty of loyalty to the corporation or its stockholders, (ii) for acts or omissions not in good faith or which involve intentional misconduct or a knowing violation of law, (iii) pursuant to Section 174 of the DGCL, which provides for liability of directors for unlawful payments of dividends of unlawful stock purchase or redemptions or (iv) for any transaction from which a director derived an improper personal benefit.

We have entered into indemnification agreements with each of our directors and officers. These indemnification agreements require us, among other things, to indemnify our directors and officers for some expenses, including attorneys' fees, judgments, fines and settlement amounts incurred by a director or officer in any action or proceeding arising out of his or her service as one of our directors or officers, or any of our subsidiaries or any other company or enterprise to which the person provides services

We maintain a general liability insurance policy that covers certain liabilities of directors and officers of our corporation arising out of claims based on acts or omissions in their capacities as directors or officers.

In any underwriting agreement we enter into in connection with the sale of common stock being registered hereby, the underwriters will agree to indemnify, under certain conditions, us, our directors, our officers and persons who control us within the meaning of the Securities Act, against certain liabilities.

Item 16. Exhibits and Financial Statement Schedules

(a) Exhibits

EXHIBIT INDEX

Exhibit No.	Description
3.1	Amended and Restated Certificate of Incorporation, filed as Exhibit 3.1 to the registrant's Current Report on Form 8-K filed with the Securities and Exchange Commission on August 1, 2022 and incorporated herein by reference
3.2	Amended and Restated Bylaws, filed as Exhibit 3.2 to the registrant's Current Report on Form 8-K filed with the Securities and Exchange Commission on August 1, 2022 and incorporated herein by reference
3.3	Certificate of Amendment to Amended and Restated Certificate of Incorporation, filed as Exhibit 3.1 to the registrant's Current Report on Form 8-K filed with the Securities and Exchange Commission on May 23, 2025 and incorporated herein by reference.
4.1	Specimen Common Stock Certificate, filed as Exhibit 4.1 to the registrant's Registration Statement on Form S-1 filed with the SEC on April 11, 2022 and incorporated herein by reference.
5.1+	Opinion of Sheppard, Mullin, Richter & Hampton, LLP
23.1+	Consent of Grant Thornton LLP
23.2+	Consent of Sheppard, Mullin, Richter & Hampton, LLP (included in Exhibit 5.1)
24.1+	Power of Attorney (included on the signature page to this registration statement)
107+	Filing fee table

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 Commission 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; and

(iii) to include any material information with respect to the plan of distribution not previously disclosed in the Registration Statement or any material change to such information in the Registration Statement;

provided, however, that paragraphs (a)(1)(i), (a)(1)(ii) and (a)(1)(iii) do not apply if the information required to be included in a post-effective amendment by those paragraphs is contained in reports filed with or furnished to the Commission by the Registrant pursuant to Section 13 or Section 15(d) of the Exchange Act that are incorporated by reference in the Registration Statement, or is contained in a form of prospectus filed pursuant to Rule 424(b) that is part of 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 of 1933 to any purchaser:

(i) Each prospectus filed by the registrant pursuant to Rule 424(b)(3) shall be deemed to be part of the registration statement as of the date the filed prospectus was deemed part of and included in the registration statement; and

(ii) Each prospectus required to be filed pursuant to Rule 424(b)(2), (b)(5), or (b)(7) as part of a registration statement in reliance on Rule 430B relating to an offering made pursuant to Rule 415(a)(l)(i), (vii), or (x) for the purpose of providing the information required by Section 10(a) of the Securities Act shall be deemed to be part of and included in the registration statement as of the earlier of the date such form of prospectus is first used after effectiveness or the date of the first contract of sale of securities in the offering described in the prospectus. As provided in Rule 430B, for liability purposes of the issuer and any person that is at that date an underwriter, such date shall be deemed to be a new effective date of the registration statement relating to the securities in the registration statement to which that prospectus relates, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof; 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 effective date, 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 effective date;

(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;

(6) That, for purposes of determining any liability under the Securities Act, each filing of the registrant's annual report pursuant to Section 13(a) or Section 15(d) of the Exchange Act (and, where applicable, each filing of an employee benefit plan's annual report pursuant to Section 15(d) of the Exchange Act) that is incorporated by reference in the registration statement shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof;

(7) Insofar as indemnification for liabilities arising under the Securities Act of 1933 may be permitted to directors, officers and controlling persons of the registrant pursuant to the foregoing provisions, or otherwise, the registrant has been advised that in the opinion of the Securities and Exchange Commission such indemnification is against public policy as expressed in the 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 Act and will be governed by the final adjudication of such issue.

SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, as amended, the registrant has duly caused this Registration Statement on Form S-3 to be signed on its behalf by the undersigned, thereunto duly authorized in the City of Chicago, State of Illinois, on the 25th day of September, 2026.

MAIA BIOTECHNOLOGY, INC.

By: */s/ Vlad Vitoc*
Name: Vlad Vitoc
Title: Chief Executive Officer

POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints Vlad Vitoc his true and lawful attorney-in-fact and agent with full power of substitution and re-substitution, for him and in his name, place and stead, in any and all capacities to sign any or all amendments (including, without limitation, post-effective amendments) to this Registration Statement, any related Registration Statement filed pursuant to Rule 462(b) under the Securities Act of 1933, as amended, and any or all pre- or post-effective amendments thereto, and to file the same, with all exhibits thereto, and all other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorney-in-fact and agent, full power and authority to do and perform each and every act and thing requisite and necessary to be done in and about the premises, as fully for all intents and purposes as he might or could do in person, hereby ratifying and confirming that said attorney-in-fact and agent, or any substitute or substitutes for him, may lawfully do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Act of 1933, as amended, this Registration Statement on Form S-3 has been signed by the following persons in the capacities and on the dates indicated below.

Signature	Title	Date
/s/ Vlad Vitoc Vlad Vitoc	Chief Executive Officer *(Principal Executive Officer)*	September 25, 2026
/s/ Jeffrey C. Himmelreich Jeffrey C. Himmelreich	Head of Finance *(Principal Financial and Accounting Officer)*	September 25, 2026
/s/ Steven Chaouki Steven Chaouki	Director	September 25, 2026
/s/ Ramiro Guerrero Ramiro Guerrero	Director	September 25, 2026
/s/ Louie Ngar Yee Louie Ngar Yee	Director	September 25, 2026
/s/ *Cristian Luput* Cristian Luput	Director	September 25, 2026
/s/ *Stan V. Smith* Stan V. Smith	Director	September 25, 2026
/s/ *Jean-Manassé Theagène* Jean-Manassé Theagène	Director	September 25, 2026

Exhibit 5.1

Sheppard

September 25, 2026

VIA ELECTRONIC MAIL

MAIA Biotechnology, Inc.
444 West Lake Street, Suite 1700,
Chicago, IL, 60606

Re: Registration Statement on Form S-3

Ladies and Gentlemen:

We have acted as counsel to MAIA Biotechnology, Inc., a Delaware corporation (the "Company"), in connection with the Registration Statement on Form S-3 (as amended or supplemented, the "Registration Statement"), filed by the Company on September 25, 2026 with the Securities and Exchange Commission (the "Commission") under the Securities Act of 1933, as amended (the "Securities Act"). The Registration Statement covers the resale of up to 751,879 shares (the "Shares") of the Company's common stock, $0.0001 par value per share (the "Common Stock"), pursuant to the terms of that certain Clinical Trial Funding Agreement, dated as of August 29, 2026, by and among the Company and the investor named therein.

This opinion letter is being delivered in accordance with the requirements of Item 601(b)(5)(i) of Regulation S-K under the Securities Act, and no opinion is expressed herein as to any matter pertaining to the contents of the Registration Statement.

In connection with the issuance of this opinion letter, we have examined originals or copies, certified or otherwise identified to our satisfaction, of:

a. the Registration Statement, including the prospectus contained therein and all exhibits thereto;

b. the Certificate of Incorporation of the Company, as amended and presently in effect (the "Charter");

c. the Bylaws of the Company, as amended and presently in effect (the "Bylaws"); and

d. certain resolutions adopted by the Board of Directors of the Company relating to the issuance of the Shares.

We have also examined originals or copies, certified or otherwise identified to our satisfaction, of such records of the Company and such agreements, certificates and receipts of public officials, certificates of officers or other representatives of the Company and others, and such other documents as we have deemed necessary or appropriate as a basis for the opinions stated below.

In our examination, we have assumed the genuineness of all signatures, including endorsements, the legal capacity and competency of all natural persons, the authenticity of all documents submitted to us as originals, the conformity to original documents of all documents submitted to us as facsimile, electronic, certified or photostatic copies, and the authenticity of the originals of such copies. As to any facts relevant to the opinions stated herein that we did not independently establish or verify, we have relied upon statements and representations of officers and other representatives of the Company and others and of public officials.

For the purposes of this opinion letter, we have assumed that at the time of issuance of the Shares, the Charter, the Bylaws, and the Series B COD, as applicable, will not have been modified or amended and will be in full force and effect. In addition, it is understood that this opinion is to be used only in connection with the offer and sale of the securities being registered while the Registration Statement is effective under the Securities Act.

Sheppard

Based upon the foregoing and subject to the qualifications and assumptions stated herein, we are of the following opinions:

The Shares held by the selling stockholder have been duly authorized by all requisite corporate action on the part of the Company under the General Corporation Law of the State of Delaware (the "DGCL") and are or will be validly issued, fully paid and non-assessable.

The opinion which we render herein is limited to those matters governed by the DGCL as of the date hereof. Our opinion expressed herein is as of the date hereof, and we assume no obligation to revise or supplement the opinion rendered herein should the above-referenced laws be changed by legislative or regulatory action, judicial decision or otherwise. We express no opinion as to whether, or the extent to which, the laws of any particular jurisdiction apply to the subject matter hereof.

We hereby consent to the filing of this opinion as an exhibit to the Registration Statement. We also hereby consent to the reference to our firm under the heading "Legal Matters" in the Registration Statement. In giving this consent, we do not thereby admit that we are within the category of persons whose consent is required under Section 7 of the Securities Act or the General Rules and Regulations under the Securities Act.

This opinion letter is rendered as of the date first written above and we disclaim any obligation to advise you of facts, circumstances, events or developments which hereafter may be brought to our attention and which may alter, affect or modify the opinion expressed herein. Our opinion is expressly limited to the matters set forth above and we render no opinion, whether by implication or otherwise, as to any other matters relating to the Company, the Shares, or any other agreements or transactions that may be related thereto or contemplated thereby. We are expressing no opinion as to any obligations that parties other than the Company may have under or in respect of the Shares or as to the effect that their performance of such obligations may have upon any of the matters referred to above. No opinion may be implied or inferred beyond the opinion expressly stated above.

Very truly yours,

/s/ Sheppard, Mullin, Richter & Hampton LLP

SHEPPARD, MULLIN, RICHTER & HAMPTON LLP

Exhibit 23.1

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We have issued our report dated March 23, 2026 with respect to the consolidated financial statements of MAIA Biotechnology, Inc. included in the Annual Report on Form 10-K for the year ended December 31, 2025, which are incorporated by reference in this Registration Statement. We consent to the incorporation by reference of the aforementioned report in this Registration Statement, and to the use of our name as it appears under the caption "Experts."

/s/ GRANT THORNTON LLP

Charlotte, NC
September 25, 2026

Calculation of Filing Fee Tables

S-3

MAIA Biotechnology, Inc.

Table 1: Newly Registered and Carry Forward Securities ☐Not Applicable

		Security Type	Security Class Title	Fee Calculation or Carry Forward Rule	Amount Registered	Proposed Maximum Offering Price Per Unit	Maximum Aggregate Offering Price	Fee Rate	Amount of Registration Fee	Carry Forward Form Type	Carry Forward File Number	Carry Forward Initial Effective Date	Filing Fee Previously Paid in Connection with Unsold Securities to be Carried Forward
Newly Registered Securities													
Fees to be Paid	1	Equity	Common Stock, par value $0.0001 per share	Other	751,879	$ 1.29	$ 969,923.91	0.0001381	$ 133.95				
Fees Previously Paid													
Carry Forward Securities													
Carry Forward Securities													
					Total Offering Amounts:		$ 969,923.91		$ 133.95				
					Total Fees Previously Paid:				$ 0.00				
					Total Fee Offsets:				$ 0.00				
					Net Fee Due:				$ 133.95				

Offering Note

1

Estimated solely for the purpose of computing the amount of the registration fee pursuant to Rule 457(c) under the Securities Act of 1933, as amended (the "Securities Act"), based upon the average of the high and low prices of the registrant's common stock as reported on the NYSE American on September 24, 2026.

Pursuant to Rule 416 under the Securities Act, the shares of common stock offered hereby also include an indeterminate number of additional shares of common stock as may from time to time become issuable by reason of stock splits, stock dividends, recapitalizations or other similar transactions.

Table 2: Fee Offset Claims and Sources ☑Not Applicable

		Registrant or Filer Name	Form or Filing Type	File Number	Initial Filing Date	Filing Date	Fee Offset Claimed	Security Type Associated with Fee Offset Claimed	Security Title Associated with Fee Offset Claimed	Unsold Securities Associated with Fee Offset Claimed	Unsold Aggregate Offering Amount Associated with Fee Offset Claimed	Fee Paid with Fee Offset Source
Rules 457(b) and 0-11(a)(2)												
Fee Offset Claims												
Fee Offset Sources												
Rule 457(p)												
Fee Offset Claims												
Fee Offset Sources												

Table 3: Combined Prospectuses ☑Not Applicable

	Security Type	Security Class Title	Amount of Securities Previously Registered	Maximum Aggregate Offering Price of Securities Previously Registered	Form Type	File Number	Initial Effective Date