



bioAffinity Technologies, Inc.

32,495,628 Shares of Common Stock

This prospectus relates to the resale from time to time of up to 32,495,628 shares of common stock, par value \$0.007 per share (the "Common Stock"), of bioAffinity Technologies, Inc. by the Selling Stockholders identified in this prospectus (the "Selling Stockholders"), including their pledgees, assignees, donees, transferees or their respective successors-in-interest consisting of: (i) 4,304,343 shares of Common Stock (the "Conversion Shares") issuable upon the conversion of 990 shares of Series B Convertible Preferred Stock (the "Series B Preferred Stock"); (ii) 6,714,780 shares of Common Stock issuable upon the exercise of common warrants (the "Private Warrants") to purchase 6,714,780 shares of Common Stock (the "Private Warrant Shares") purchased by certain institutional investors (the "Investors") in a private placement transaction (the "August 2025 Private Placement") pursuant to the terms of a securities purchase agreement dated as of August 13, 2025, (the "August Purchase Agreements") between us and the Investors; (iii) 1,430,000 shares of Common Stock issuable upon the exercise of common warrants (the "Inducement Warrants") to purchase 1,430,000 shares of Common Stock (the "Inducement Warrant Shares") purchased by certain existing warrant holders (the "Warrant Inducement Holders") in a private placement transaction (the "Warrant Inducement Private Placement") pursuant to the terms of a warrant inducement letter agreement dated as of August 13, 2025, (the "Inducement Agreement") between us and the Warrant Inducement Holders; (iv) an additional 19,884,375 shares of Common Stock pursuant to the anti-dilution adjustment provision of common stock purchase warrants (the "May 2025 Warrants") to purchase 19,884,375 shares of Common Stock (the "May 2025 Warrant Shares") purchased by certain existing warrant holders (the "May 2025 Warrant Holders") in a public offering (the "May Offering") pursuant to the terms of a securities purchase agreement dated May 5, 2025 (the "May Purchase Agreement") and (v) 162,130 shares of Common Stock issuable upon the exercise of warrants to purchase 162,130 shares of Common Stock issued to designees of WallachBeth Capital LLC ("WallachBeth"), of which (a) 33,000 shares of Common Stock issuable upon the exercise of warrants (the "Inducement Advisor Warrants") to purchase 33,000 shares of Common Stock (the "Inducement Advisor Warrant Shares") were partial compensation for WallachBeth acting as financial advisor in connection with the Warrant Inducement Private Placement pursuant to the terms of a financial advisory agreement dated as of August 13, 2025, (the "Advisory Agreement") and (b) 129,130 shares of Common Stock issuable upon the exercise of warrants (the "Placement Agent Warrants") to purchase 129,130 shares of Common Stock (the "Placement Agent Warrant Shares") were partial compensation for WallachBeth acting as placement agent in connection with the August 2025 Private Placement pursuant to the terms of a placement agency agreement dated as of August 13, 2025, (the "Placement Agency Agreement"). Each of the August 2025 Private Placement and the Warrant Inducement Private Placement closed on August 14, 2025. The Investors, the Warrant Inducement Holders, the May 2025 Warrant Holders and the designees of WallachBeth that received Inducement Advisor Warrants and/or Placement Agent Warrants are collectively referred to herein as the "Selling Stockholders." The Private Warrants, the Inducement Warrants, the Inducement Advisor Warrants, the May 2025 Warrants and the Placement Agent Warrants are collectively referred to herein as the "Common Warrants." The Conversion Shares, Private Warrant Shares, the Inducement Warrant Shares, the Inducement Advisor Warrant Shares the May 2025 Warrant Shares and the Placement Agent Warrant Shares are collectively referred to herein as the "Resale Shares."

We are filing this registration statement on Form S-1, of which this prospectus forms a part, to fulfill our contractual obligations to provide for the registration of the resale of the Common Warrant Shares by Selling Stockholders. See "Selling Stockholders" beginning on page 12 of this prospectus for more information about the Selling Stockholders. The registration of the shares of Common Stock to which this prospectus relates does not require the Selling Stockholders to sell any of their shares of our Common Stock.

We are not offering any shares of Common Stock under this prospectus and will not receive any proceeds from the sale or other disposition of the shares of our Common Stock covered hereby. However, we will receive the proceeds from any exercise of the Common Warrants for cash. See "Use of Proceeds" beginning on page 11 of this prospectus.

The Selling Stockholders identified in this prospectus, or their pledgees, assignees, donees, transferees or their respective successors-in-interest, from time to time may offer and sell through public or private transactions at prevailing market prices, at prices related to prevailing market prices or at privately negotiated prices the shares held by them directly or through underwriters, agents or broker-dealers on terms to be determined at the time of sale, as described in more detail in this prospectus. See "Plan of Distribution" beginning on page 20 of this prospectus for more information about how the Selling Stockholders may sell their respective shares of Common Stock. The Selling Stockholders may be deemed "underwriters" within the meaning of Section 2(a)(11) of the Securities Act of 1933, as amended. (the "Securities Act").

We have agreed, pursuant to the terms of the Purchase Agreement, Inducement Agreement, the Placement Agency Agreement and the Advisory Agreement, as applicable, to bear all of the expenses in connection with the registration of the Common Warrant Shares pursuant to this prospectus. The Selling Stockholders will pay or assume all commissions, discounts, fees of underwriters, agents, selling brokers or dealer managers and similar expenses, if any, attributable to their respective sales of the shares of Common Stock.

Our Common Stock is listed on the Nasdaq Capital Market under the symbol "BIAF". On September 10, 2025, the closing price of our Common Stock on the Nasdaq Capital Market was \$0.256 per share.

Investing in our securities involves risks. You should review carefully the risks and uncertainties described under the heading "Risk Factors" contained in this prospectus and under similar headings in the other documents that are incorporated by reference into this prospectus, as described beginning on page 7 of this prospectus.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or passed upon the adequacy or accuracy of this prospectus. Any representation to the contrary is a criminal offense. The securities are not being offered in any jurisdiction where the offer is not permitted.

The date of this prospectus is September 16, 2025

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The registration statement containing this prospectus, including the exhibits to the registration statement, provides additional information about us and the Common Stock offered under this prospectus. The registration statement, including the exhibits, can be read on our website and the website of the Securities and Exchange Commission. See “Where You Can Find Additional Information.”

Information contained in, and that can be accessed through our web site, www.bioaffinity.com, shall not be deemed to be part of this prospectus or incorporated herein by reference and should not be relied upon by any prospective investors for the purposes of determining whether to purchase the Common Stock offered hereunder.

Unless the context otherwise requires, the terms “we,” “us,” “our,” “the Company,” “bioAffinity” and “our business” refer to bioAffinity Technologies, Inc. and “this offering” refers to the offering contemplated in this prospectus.

ABOUT THIS PROSPECTUS

Neither we nor the Selling Stockholders have authorized anyone to provide you with any information or to make any representations other than those contained in this prospectus, any post-effective amendment, or any applicable prospectus supplement prepared by or on behalf of us or to which we have referred you. We and the Selling Stockholders take no responsibility for and can provide no assurance as to the reliability of any other information that others may give you. This prospectus is an offer to sell only the securities offered hereby, but only under circumstances and in jurisdictions where it is lawful to do so. The information contained in this prospectus is current only as of the date on the front cover of the prospectus. Our business, financial condition, results of operations and prospects may have changed since that date.

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, will be filed or will be incorporated by reference as exhibits to the registration statement of which this prospectus is a part, and you may obtain copies of those documents as described below under the section entitled “Where You Can Find Additional Information.”

Industry and Market 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 third-party 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. Although we believe these third-party sources are reliable as of their respective dates, neither we nor the underwriters have independently verified the accuracy or completeness of this information. Some data is also based on our good faith estimates. The industry in which we operate is subject to a high degree of uncertainty and risk due to a variety of factors, including those described in the section entitled “Risk Factors.” These and other factors could cause results to differ materially from those expressed in these publications.

Trademarks and Trade Names

We own or have rights to various trademarks, service marks, and trade names that we use in connection with the operation of our business. This prospectus may also contain trademarks, service marks, and trade names of third parties, which are the property of their respective owners. Our use or display of third parties’ trademarks, service marks, trade names, or products in this prospectus is not intended to, and does not imply a relationship with or endorsement or sponsorship by us. Solely for convenience, the trademarks, service marks, and trade names referred to in this prospectus may appear without the ®, TM or SM symbols, but such references are not intended to indicate, in any way, that we will not assert, to the fullest extent under applicable law, our rights or the right of the applicable licensor to these trademarks, service marks, and trade names.

CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS

Certain statements in this prospectus, including the documents incorporated by reference herein and therein, may contain “forward-looking statements” within the meaning of the federal securities laws. Our forward-looking statements include, but are not limited to, statements about us and our industry, as well as statements regarding our or our management team’s expectations, hopes, beliefs, intentions or strategies regarding the future. Additionally, any statements that refer to projections, forecasts or other characterizations of future events or circumstances, including any underlying assumptions, are forward-looking statements. We intend the forward-looking statements to be covered by the safe harbor provisions of the federal securities laws. Words such as “may,” “should,” “could,” “would,” “predicts,” “potential,” “continue,” “expects,” “anticipates,” “future,” “intends,” “plans,” “believes,” “estimates,” and similar expressions, as well as statements in future tense, may identify forward-looking statements, but the absence of these words does not mean that a statement is not forward-looking.

Forward-looking statements should not be read as a guarantee of future performance or results and may not be accurate indications of when such performance or results will be achieved. Forward-looking statements are based on information we have when those statements are made or management’s good faith belief as of that time with respect to future events, and are subject to significant risks and uncertainties that could cause actual performance or results to differ materially from those expressed in or suggested by the forward-looking statements. Important factors that could cause such differences include, but are not limited to:

- our projected financial position and estimated cash burn rate;
- our estimates regarding expenses, future revenues, and capital requirements;
- the success, cost, and timing of our clinical trials;
- our ability to obtain funding for our operations necessary to complete further development and commercialization of our diagnostic tests or therapeutic product candidates;
- our dependence on third parties in the conduct of our clinical trials;
- our ability to obtain the necessary regulatory approvals to market and commercialize our diagnostic tests or therapeutic product candidates;
- the potential that the results of our pre-clinical and clinical trials indicate our current diagnostic tests or any future diagnostic tests or therapeutic product candidates we may seek to develop are unsafe or ineffective;
- the results of market research conducted by us or others;
- our ability to obtain and maintain intellectual property protection for our diagnostic and therapeutic inventions or future diagnostic and therapeutic inventions to expand our product offerings;
- our ability to protect our intellectual property (“IP”) rights and the potential for us to incur substantial costs from lawsuits to enforce or protect our IP rights;
- the possibility that a third party may claim we or our third-party licensors have infringed, misappropriated, or otherwise violated their IP rights and that we may incur substantial costs and be required to devote substantial time defending against such claims;
- our reliance on third parties;
- the success of competing therapies, diagnostic tests, and therapeutic products that are or will become available;
- our ability to expand our organization to accommodate potential growth and to retain and attract key personnel;

- our potential to incur substantial costs resulting from product liability lawsuits against us and the potential for such lawsuits to cause us to limit the commercialization of our diagnostic tests and therapeutic product candidates;
- market acceptance of our diagnostic tests and therapeutic product candidates, the size and growth of the potential markets for our current diagnostic tests and therapeutic product candidates, and any future diagnostic tests and therapeutic product candidates we may seek to develop, and our ability to serve those markets;
- the successful development of our commercialization capabilities, including sales and marketing capabilities;
- compliance with government regulations, including environmental, health, and safety regulations and liabilities thereunder;
- the impact of a health epidemic on our business, our clinical trials, our research programs, healthcare systems, or the global economy as a whole;
- general instability of economic and political conditions in the United States (“U.S.”), including inflationary pressures, increased interest rates, economic slowdown or recession, and escalating geopolitical tensions;
- our anticipated uses of net proceeds from our financings;
- the increased expenses associated with being a public company; and
- other factors discussed elsewhere in this prospectus.

Many of the foregoing risks and uncertainties, as well as risks and uncertainties that are currently unknown to us, are or may be exacerbated by factors such as the ongoing conflict between Ukraine and Russia, escalating tensions between China and Taiwan, the war in the Middle East, increasing economic uncertainty and inflationary pressures, and any consequent worsening of the global business and economic environment. New factors emerge from time to time, and it is not possible for us to predict all such factors. Should one or more of the risks or uncertainties described in this prospectus or any other filing with the SEC occur, or should the assumptions underlying the forward-looking statements we make herein and therein prove incorrect, our actual results and plans could differ materially from those expressed in any forward-looking statements. We undertake no obligation to update publicly any forward-looking statements, whether as a result of new information, future events, or otherwise, except as required by law.

You should read this prospectus, the documents incorporated by reference herein, and the documents that we reference within it with the understanding that our actual future results, performance, and events and circumstances may be materially different from what we expect.

Website and Social Media Disclosure

We use our websites (www.bioaffinitytech.com, ir.bioaffinitytech.com, www.cypathlung.com and www.Precisionpath.us/) to share Company information. Information contained on or that can be accessed through our websites is not, however, incorporated by reference in this prospectus. Investors should not consider any such information to be part of this prospectus.

PROSPECTUS SUMMARY

This summary provides an overview of information appearing elsewhere in this prospectus and highlights the key aspects of this Offering. This summary does not contain all of the information you should consider prior to investing in our Common Stock or Warrants. You should read this entire prospectus carefully, including the sections titled “Risk Factors” and “Management’s Discussion and Analysis of Financial Condition and Results of Operations” and our consolidated financial statements and related notes appearing at the end of this prospectus, before making any investment decision. Our fiscal year ends on December 31. Unless the context otherwise requires, references to “bioAffinity,” the “Company,” “we,” “us,” and “our” in this prospectus refer to bioAffinity Technologies, Inc. and our consolidated subsidiaries.

Company Overview

bioAffinity Technologies, Inc. (the “Company,” “bioAffinity,” “we,” or “our”) develops noninvasive diagnostics to detect early-stage lung cancer and other diseases of the lung using flow cytometry and automated analysis developed by machine learning, a form of artificial intelligence (“AI”). Our diagnostic platform analyzes cell populations that are indicative of a specific disease and uses AI to standardize sample data analysis and patient test results.

Our first diagnostic test, CyPath® Lung, addresses the need for noninvasive detection of early-stage lung cancer. Lung cancer is the leading cause of cancer-related deaths worldwide. Physicians order CyPath® Lung to assist in their decision-making in the diagnosis of patients who are at high risk for lung cancer. The CyPath® Lung test enables physicians to more confidently identify patients who will likely benefit from timely intervention and more invasive follow-up procedures including biopsy and those who are likely without lung cancer and should continue screening in accordance with guidelines. CyPath® Lung has been shown to detect lung cancer at Stage 1A, its earliest stage, and has the potential to increase overall diagnostic accuracy of lung cancer, which could lead to increased survival, fewer unnecessary invasive procedures, reduced patient anxiety, and lower medical costs.

Commercial laboratory services, including CyPath® Lung, are performed at our wholly owned subsidiary Precision Pathology Laboratory Services (“PPLS”) which we acquired by purchasing the assets of Village Oaks Pathology Services, P.A., a Texas professional association d/b/a Precision Pathology Services, that included the CAP-accredited and CLIA-certified commercial laboratory it owned. We own and operate PPLS, a clinical anatomic and pathology laboratory that offers CyPath® Lung for sale to physicians and is reimbursed by Medicare and private insurance carriers.

We continue to advance development of our flow cytometry+AI platform for companion diagnostic tests targeted at chronic obstructive pulmonary disease (“COPD”) and asthma. Diagnostics under development are designed to detect specific receptors in sputum that determine the effectiveness of new and emerging therapies for asthma and COPD that have proven to effectively treat some but not all patients.

Through our wholly owned subsidiary, OncoSelect® Therapeutics, LLC, we have conducted research that has led to discoveries and advancement of novel cancer therapeutic approaches that specifically and selectively target cancer cells. We continue to advance research and development for use of this technology for topical treatment of squamous cell skin cancer. We have presented our findings at conferences and will continue to do so, as well as publish our research in peer-reviewed journals in the near future. We intend to seek strategic partners to develop our therapeutic discoveries which could result in broad-spectrum cancer treatments in the future.

Recent Developments

On September 2, 2025, the Company and the holders of the warrants issued by the Company on May 7, 2025 (the “May 2025 Warrants”) and the warrants issued by the Company on August 13, 2025 (the “August 2025 Warrants”) agreed, effective as of August 12, 2025, to amend the Floor Price (as such term is defined in each of the May 2025 Warrants and the August 2025 Warrants) so as to increase it from \$0.10 to \$0.15. As a result, the total number of shares issuable upon exercise of the May 2025 Warrants was reduced from 53,377,497 to 35,584,997.

On August 14, 2025, we completed a private placement with certain institutional and accredited investors for gross proceeds of approximately \$1.2 million, before deducting agent fees and other estimated expenses payable by us. The offering consisted of (i) 990 shares of our newly designated Series B Convertible Preferred Stock, with a par value \$0.001 per share and stated value of \$1,000 per share initially convertible into 4,304,343 shares of our Common Stock at an initial conversion price of \$0.23 per share and (ii) warrants to purchase up to 6,714,780 shares of our Common Stock at an exercise price of \$0.352 per share of Common Stock.

On August 14, 2025, we also completed a warrant inducement transaction with the holder of a warrant, pursuant to which such holder exercised for cash a total of 1,100,000 warrants originally issued in August 2024 and October 2024, at the reduced exercise price of \$0.23 per share, for aggregate gross proceeds of approximately \$253,000. In connection with the immediate exercise of the August 2024 and October 2024 Warrants, we issued unregistered common warrants to purchase an aggregate of up to 1,430,000 shares of Common Stock at an exercise price of \$0.352 per share, which warrants are not exercisable until our stockholders approve such exercise.

Corporate Information

We were incorporated in the State of Delaware on March 26, 2014. Our principal executive office is located at 3300 Nacogdoches Road, Suite 216, San Antonio, Texas 78217, and our telephone number at that address is (210) 698-5334. Our website address is <https://www.bioaffinitytech.com/>. Information contained on or that can be accessed through our website is not incorporated by reference into this prospectus. Investors should not consider any such information to be part of this prospectus.

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

We qualify as an “emerging growth company” (an “EGC”) as defined in the Jumpstart Our Business Startups Act of 2012 (the “JOBS Act”). As an EGC, for up to five years, we may elect to take advantage of certain specified exemptions from reporting and other regulatory requirements that are otherwise generally applicable to public companies. For example, these exemptions would allow us to:

- present two, rather than three, years of audited financial statements with correspondingly reduced disclosure in the “Management’s Discussion and Analysis of Financial Condition and Results of Operations” section (the “MD&A”) of this prospectus;
- defer the auditor attestation requirement on the effectiveness of our system of internal control over financial reporting;
- make reduced disclosures about our executive compensation arrangements; and
- forego the adoption of new or revised financial accounting standards until they would be applicable to private companies.

Certain of these reduced reporting requirements and exemptions were already available to us due to the fact that we also qualify as a “smaller reporting company” under SEC rules. For instance, smaller reporting companies are not required to obtain an auditor attestation and report regarding internal control over financial reporting, to provide a compensation discussion and analysis, or to provide a pay-for-performance graph or CEO pay ratio disclosure, and they may present two, rather than three, years of audited financial statements and related MD&A disclosure.

We may take advantage of these exemptions until such time that we are no longer an EGC. We will continue to remain an EGC until the earliest of the following: (i) the last day of the fiscal year following the fifth anniversary of our initial public offering; (ii) the last day of the fiscal year in which our total annual gross revenue is equal to or more than \$1.235 billion; (iii) the date on which we have issued more than \$1 billion in nonconvertible debt during the previous three years; or (iv) the date on which we are deemed to be a large accelerated filer, as defined in the Securities Exchange Act of 1934, as amended (the “Exchange Act”).

We are also a “smaller reporting company” as defined in the Exchange Act and have elected to take advantage of certain of the scaled disclosures available to smaller reporting companies. To the extent that we continue to qualify as a “smaller reporting company” as such term is defined in Rule 12b-2 under the Exchange Act, after we cease to qualify as an EGC, certain of the exemptions available to us as an EGC may continue to be available to us as a “smaller reporting company,” including exemption from compliance with the auditor attestation requirements pursuant to the Sarbanes-Oxley Act of 2002 (“SOX”) and reduced disclosure about our executive compensation arrangements. We will continue to be a “smaller reporting company” until we have \$250 million or more in public float (based on our Common Stock) measured as of the last business day of our most recently completed second fiscal quarter or, in the event we have no public float (based on our Common Stock) or a public float (based on our Common Stock) that is less than \$700 million, annual revenues of \$100 million or more during the most recently completed fiscal year.

We may choose to take advantage of some, but not all, of the available exemptions. We have taken advantage of certain reduced reporting obligations in this prospectus. Accordingly, the information contained herein may be different than the information you receive from other public companies in which you hold stock. In addition, the JOBS Act provides that an EGC may take advantage of an extended transition period for complying with new or revised accounting standards, delaying the adoption of these accounting standards until they would apply to private companies. We have elected to avail ourselves of the extended transition period for complying with new or revised financial accounting standards. As a result of the accounting standards election, we will not be subject to the same implementation timing for new or revised accounting standards as other public companies that are not EGCs which may make comparison of our financials to those of other public companies more difficult.

Summary of Risk Factors

Like any emerging growth company, we face significant risk factors that may impede our plans for successful commercialization of our diagnostic and therapeutic products. These risks are discussed in detail under the “Risk Factors” discussion beginning on page 7 of this prospectus.

The following summarizes the principal factors that make an investment in our Company speculative or risky, all of which are more fully described in the section below titled “Risk Factors.” This summary should be read in conjunction with the section below titled “Risk Factors” and should not be relied upon as an exhaustive summary of the material risks facing our business. The following factors could result in harm to our business, reputation, revenue, financial results, and prospects, among other impacts:

Risks Related to Our Financial Position

- Our business plan relies upon our ability to obtain additional sources of capital and financing.
- We must raise additional capital to fund our operations in order to continue as a going concern.
- Our limited operating history makes it difficult to evaluate our business and future prospects.
- We are unable to precisely estimate when we will begin to generate significant profit from PPLS.
- We have limited experience operating a laboratory.

Risks Related to our Diagnostic Product

- Delays or difficulties in the enrollment of patients could delay or prevent regulatory approvals.
- Clinical trials are expensive, time-consuming, and may not be successful.

Risks Related to Our Diagnostic Tests

- If our tests do not perform as expected, our operating results, reputation, and business will suffer.
- We may experience difficulties that delay or prevent our development, introduction, or marketing of enhanced or new tests.
- Clinical testing of a particular diagnostic test or therapeutic product candidate may not yield successful results.
- Even if our diagnostic tests or therapeutic products receive marketing approval, we may not be successful in commercializing them.
- We are currently dependent upon our laboratory subsidiary, PPLS, to offer and perform CyPath[®] Lung.
- If we cannot convince physicians of the benefits of our diagnostic tests or therapeutic products, market acceptance could be delayed.
- We face substantial competition.
- Our success depends upon our ability to retain key executives and attract and retain qualified personnel.
- Our lack of operating experience may make it difficult to manage our growth.
- We will depend on third parties to supply reagents and equipment necessary to perform our diagnostic tests and to design trial protocols and monitor clinical trials.

- We are exposed to product liability and pre-clinical and clinical liability risks.
- Our failure to comply with privacy and security regulations could result in liability or reputational harm.
- Our ability to obtain adequate reimbursement for our diagnostic tests may impact our revenues.
- Our employees, consultants, partners, and vendors may engage in misconduct or other improper activities.
- Failure to comply with healthcare laws and regulations could result in substantial penalties.
- We face intense competition in the biotechnology and pharmaceutical industries.
- The market for our proposed tests and products is competitive and rapidly changing.
- Healthcare cost containment initiatives and the growth of managed care may limit our returns.
- Disruption of internal information technology systems will adversely affect our business.
- Declining general economic or business conditions may have a negative impact on our business.
- Global climate change and related regulations could negatively affect our business.

Risks Related to the Operation of a CAP/CLIA Laboratory

- PPLS' operations depend upon the relationship of certain of our pathologists with existing customers.
- PPLS may be unable to maintain equipment or generate revenue when its equipment is not operational.
- If our sole laboratory facility becomes damaged or inoperable, loses its accreditation, or is required to vacate the facility, PPLS' ability to sell its products or provide diagnostic assays and pursue its research and development efforts may be jeopardized.
- Disruption in the commercial courier delivery services used by PPLS to transport sputum samples could harm its business.
- Security breaches, data loss, and other disruptions could compromise sensitive information of PPLS' business.
- If PPLS uses hazardous chemicals in a manner that causes injury, PPLS could be liable for damages.
- If PPLS is unable to successfully scale its operations to support demand, its business could suffer.
- PPLS must dedicate substantial time and resources to its complex billing process to be paid.
- Delays of third-party billing and collection providers and an in-house billing function to transmit claims to payors could have an adverse effect on PPLS.

Risks Related to Intellectual Property Rights

- If we fail to comply with our obligations imposed by any intellectual property licenses with third parties that we may need in the future, we could lose rights that are important to our business.
- We may need to obtain licenses of third-party technology that may not be available to us or available to us on reasonable terms.
- Our competitive position depends on protection of our intellectual property. Diagnostic tests and therapeutic products we develop could be subject to infringement claims.
- We may become involved in lawsuits to protect or enforce our intellectual property.
- If we are unable to protect our trade secrets, our business and competitive position could be harmed.
- Changes in patent law could impair our ability to protect our tests and product candidates.
- Our patent protection could be reduced or eliminated for non-compliance with governmental requirements.
- Patent terms may be inadequate to protect our diagnostic tests or therapeutic product candidates.
- Issued patents could be found invalid or unenforceable.
- If we do not obtain patent term extension, our business may be harmed.
- We enjoy only limited geographical protection with respect to certain patents.
- If our trademarks and trade names are not adequately protected, we may not be able to build name recognition.

Risks Related to Government Regulations

- Failure to comply with laws pertaining to laboratory developed tests (“LDTs”) or in vitro devices (“IVDs”) could adversely affect our business.
- Third-party licensors of our future therapeutic products may be unable to obtain regulatory approval.
- Failure to obtain regulatory approval in foreign jurisdictions would prevent our product candidates from being marketed in those jurisdictions that deny approval.
- We may never obtain approval or commercialize such products outside of the U.S.
- The impact of changes to healthcare policy and future healthcare reform legislation is unknown.

Risks Related to Ownership of Our Common Stock and Warrants

- Our failure to meet the listing requirements of The Nasdaq Capital Market could result in a de-listing of our Common Stock.
- We do not expect to pay dividends in the foreseeable future.
- Our Common Stock market price may never exceed the exercise price of our outstanding warrants.
- Holders of our warrants have no rights as stockholders until they exercise their warrants.
- The provisions of our outstanding warrants could limit a warrant holder’s ability to choose the judicial forum for disputes.
- The financial and operational projections that we may make from time to time are subject to inherent risks.
- Our stock price has fluctuated in the past, has recently been volatile, and may be volatile in the future.
- Our Common Stock has often been thinly traded.
- An investment in our Company may involve tax implications.
- Our ability to use our net operating loss carryforwards and certain other tax attributes may be limited.
- Our Board can designate classes of Preferred Stock without stockholder approval.
- Provisions in our corporate charter documents and under Delaware law could make an acquisition of the Company more difficult.
- Provisions in our Charter and Amended and Restated (“A&R”) Bylaws could make a merger, tender offer, or proxy contest difficult.
- Certain provisions of the Delaware General Corporation Law (“DGCL”) may have anti-takeover effects.
- Our Charter designates Delaware state or federal courts as the exclusive forum for disputes.
- Provisions in our Charter and A&R Bylaws may discourage stockholders from bringing a lawsuit against our directors and officers.
- Our management collectively owns a substantial percentage of our Common Stock.
- If analysts publish unfavorable research, or none at all, about our business, our stock price and trading volume could decline.
- Any inability to report and file our financial results accurately and timely could harm our business.

Risks Related to the Offering

- Our Common Stock could be subject to extreme volatility.
- Future sales and issuances of our securities could result in additional dilution of the percentage ownership of our stockholders and could cause our share price to fall.
- The Nasdaq Capital Market may subsequently delist our Common Stock if we fail to comply with ongoing listing standards.

THE OFFERING

This prospectus relates to the resale or other disposition from time to time by the Selling Stockholders identified in this prospectus of up to 32,495,628 shares of our Common Stock. None of the shares registered hereby are being offered for sale by us.

Shares of Common Stock offered by the Selling Stockholders (i) 4,304,343 shares of Common Stock issuable upon the conversion of the Series B Preferred Stock; (ii) 6,714,780 shares of Common Stock issuable upon the exercise of the Private Placement Warrants; (iii) 1,430,000 shares of Common Stock issuable upon the exercise of the Inducement Warrants; (iv) 19,884,375 shares of Common Stock issuable upon the exercise of the May 2025 Warrants; (v) 33,000 shares of Common Stock issuable upon the exercise of the Inducement Advisor Warrants; and (vi) 129,130 shares of Common Stock issuable upon the exercise of the Placement Agent Warrants.

Common stock to be outstanding after this offering⁽¹⁾ 62,064,239 shares of Common Stock, assuming the conversion of all Series B Preferred Stock and exercise of all of the Common Warrants

Registration Rights In connection with the August 2025 Private Placement, we entered into a registration rights agreement (the “Registration Rights Agreement”), dated as of August 13, 2025, with each of the Investors. Under the terms of the Registration Rights Agreement, the May Purchase Agreement and Inducement Agreement, we agreed to prepare and file this registration statement with respect to the registration of the Resale Shares by the Selling Stockholders, as applicable, by the 15th calendar day following the date of the applicable agreement. In addition, we agreed that, upon the registration statement being declared effective under the Securities Act, we will use commercially reasonable efforts to maintain the effectiveness of the registration statement until the date that the Selling Stockholders no longer own any of the Series B Preferred Stock, Common Warrants or Resale Shares, as applicable.

See “Selling Stockholders” beginning on page 12 of this prospectus for more information about the Selling Stockholders. The registration of the shares of Common Stock to which this prospectus relates does not require the Selling Stockholders to sell any of their shares of our Common Stock.

Use of Proceeds The Selling Stockholders will receive all of the proceeds of the sale of shares of Common Stock offered from time to time pursuant to this prospectus. Accordingly, we will not receive any proceeds from the sale of shares of Common Stock that may be sold from time to time pursuant to this prospectus; however, we will receive proceeds from any conversion of the Series B Preferred Stock and/or cash exercise of the Common Warrants. See “Use of Proceeds.” We intend to use the proceeds from the any conversion of the Series B Preferred Stock and/or cash exercise of the Common Warrants for working capital purposes.

Plan of Distribution The Selling Stockholders named in this prospectus, or their pledgees, donees, transferees, distributees, beneficiaries or other successors-in-interest, may offer or sell the shares of Common Stock offered hereby from time to time through public or private transactions at prevailing market prices, at prices related to prevailing market prices or at privately negotiated prices. The Selling Stockholders may also resell the shares of Common Stock to or through underwriters, broker-dealers or agents, who may receive compensation in the form of discounts, concessions or commissions.

Risk Factors See “Risk Factors” beginning on page 7 of this prospectus and in the documents incorporated by reference in this prospectus and the other information included in this prospectus for a discussion of factors you should carefully consider before investing in our securities.

Nasdaq Capital Market trading symbol Our Common Stock is listed on the Nasdaq Capital Market under the symbol “BIAF.”

(1) The number of shares of Common Stock to be outstanding immediately after this offering is based on 29,568,612 shares of Common Stock outstanding as of September 10, 2025, and excludes, as of such date:

- 55,820,963 shares of Common Stock issuable upon the exercise of outstanding warrants with a weighted average exercise price equal to \$0.75 per share;
- 271,987 shares of Common Stock issuable upon the exercise of stock options issued under our equity incentive plans with a weighted average exercise price equal to \$7.05 per share; and
- 1,257,254 shares of our Common Stock that are reserved for equity awards that may be granted under our 2024 Equity Incentive Plan.

RISK FACTORS

Investing in our Company involves a high degree of risk. You should carefully consider the following information about these risks, together with the other information appearing elsewhere in this Prospectus before deciding to invest in our Company. The occurrence of any of the following risks could have a material and adverse effect on our business, reputation, financial condition, results of operations, and future growth prospects, as well as our ability to accomplish our strategic objectives. As a result, the market value of our Common Stock could decline, and you could lose all or part of your investment. Additional risks and uncertainties not presently known to us or that we currently deem immaterial may also impair our business operations and market value. The risks and uncertainties described below are not the only ones facing us. Additional risks and uncertainties not presently known to us, or that we currently see as immaterial, may also harm our business. Please also read carefully the section above entitled "Special Note Regarding Forward-Looking Statements" and all of the other information contained or incorporated by reference in this prospectus.

Risks Related to this Offering

Resales of our Common Stock in the public market by our stockholders as a result of this offering may cause the market price of our Common Stock to fall.

We are registering Common Stock issuable upon the conversion of our Series B Preferred Stock and exercise of the Common Warrants. Sales of substantial amounts of our Common Stock in the public market, or the perception that such sales might occur, could adversely affect the market price of our Common Stock. The issuance of new shares of Common Stock could result in resales of our Common Stock by our current stockholders concerned about the potential ownership dilution of their holdings. Furthermore, in the future, we may issue additional shares of Common Stock or other equity or debt securities exercisable or convertible into Common Stock. Any such issuance could result in substantial dilution to our existing stockholders and could cause our stock price to decline.

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

Investors who purchase shares in this offering at different times will likely pay different prices, and so may experience different levels of dilution and different outcomes in their investment results.

This offering may cause the trading price of our Common Stock to decrease.

The price per share of our Common Stock, together with the number of shares of Common Stock we propose to issue upon conversion of the Series B Preferred Stock and exercise of the Common Warrants and ultimately will issue if this offering is completed, may result in an immediate decrease in the market price of our Common Stock. This decrease may continue after the completion of this offering. Sales of substantial amounts of our Common Stock in the public market, or the perception that such sales might occur, could adversely affect the market price of our Common Stock.

Our management will have broad discretion over the use of the net proceeds from this offering, you may not agree with how we use the proceeds, and the proceeds may not be invested successfully.

We have not designated any portion of the net proceeds from the conversion of the Series B Preferred Stock and/or exercise of Common Warrants to be used for any particular purpose. Accordingly, our management will have broad discretion as to the use of the net proceeds and you will be relying on the judgment of our management with regard to the use of these net proceeds, 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 the net proceeds in a way that does not yield a favorable, or any, return for our company. Our management's judgment may not result in positive returns on your investment, and you will not have the opportunity to evaluate the economic, financial or other information upon which our management bases its decisions.

The Nasdaq Capital Market may subsequently delist our Common Stock if we fail to comply with ongoing listing standards.

On February 7, 2025, we received written notice from the Listing Qualifications Department of The Nasdaq Stock Market LLC ("Nasdaq") notifying us that for the preceding 30 consecutive business days (December 23, 2024, through February 6, 2025), our Common Stock did not maintain a minimum closing bid price of \$1.00 ("Minimum Bid Price Requirement") per share as required by Nasdaq Listing Rule 5550(a)(2). Therefore, in accordance with Nasdaq Listing Rule 5810(c)(3)(A), we were provided 180 calendar days, or until August 6, 2025, to regain compliance with the rule.

On May 27, 2025, we received written notice from the Nasdaq Staff stating that we were not in compliance with Nasdaq Listing Rule 5550(b)(1) (the "Continued Listing Equity Requirement") because our stockholders' equity of \$1,439,404 as of March 31, 2025, as reported in the Company's Quarterly Report on Form 10-Q filed with the SEC on May 15, 2025, was below the minimum requirement of \$2,500,000. Pursuant to Nasdaq's Listing Rules, we had 45 calendar days to submit a plan to regain compliance (a "Compliance Plan") with the Continued Listing Equity Requirement. On July 14, 2025, the Company submitted its plan to regain compliance with the Continued Listing Equity Requirement.

On August 7, 2025, we received written notice from the Listing Qualifications Staff of Nasdaq that we had not regained compliance with the Minimum Bid Price Requirement by August 6, 2025 and were not eligible for a second 180-day compliance period as we did not comply with the minimum stockholders' equity requirement for initial listing on The Nasdaq Capital Market. As a result, unless we request an appeal to a hearings panel (the "Panel") by August 14, 2025, our securities would be scheduled for delisting from The Nasdaq Capital Market and would be suspended at the opening of business on August 18, 2025.

We submitted an appeal to Nasdaq on August 14, 2025, which will stay the delisting and suspension of the Company's securities pending the decision of the Panel. On August 14, 2025, we received written notice from Nasdaq that our hearing was scheduled for September 11, 2025. At the hearing, the Company presented its views and its plans to regain compliance with the Minimum Bid Price Requirement and the Continued Listing Equity Requirement to the Panel. The Company expects to receive the decision of the Panel approximately two weeks following the hearing. There can be no assurance that the Company will be able to evidence compliance with the Minimum Bid Price Rule, the Continued Listing Equity Requirement or any other applicable requirements for continued listing on The Nasdaq Capital Market prior to the hearing.

If we are delisted from Nasdaq, but obtain a substitute listing for our Common Stock, it will likely be on a market with less liquidity, and therefore experience potentially more price volatility than experienced on Nasdaq. Stockholders may not be able to sell their shares of Common Stock on any such substitute market in the quantities, at the times, or at the prices that could potentially be available on a more liquid trading market. As a result of these factors, if our Common Stock is delisted from Nasdaq, the value and liquidity of our Common Stock, warrants and pre-funded warrants would likely be significantly adversely affected. A delisting of our Common Stock from Nasdaq could also adversely affect our ability to obtain financing for our operations and/or result in a loss of confidence by investors, employees and/or business partners.

THE PRIVATE PLACEMENTS

Warrant Inducement Private Placement

On August 13, 2025, we entered into the Inducement Agreement with the Warrant Inducement Holders that had previously purchased warrants to purchase 450,000 shares of Common Stock originally issued on August 5, 2024, with a current exercise price of \$1.25 per share (the “August 2024 Warrant”) and warrants to purchase 650,000 shares of Common Stock originally issued on October 21, 2024, with a current exercise price of \$1.50 per share (the “October 2024 Warrant” and together with the August 2024 Warrant, the “Existing Warrants”). Pursuant to the Inducement Agreement, the Warrant Inducement Holders agreed to exercise in cash the Existing Warrants at a reduced exercise price of \$0.23 per share, for gross proceeds to the Company of \$253,000.

The offer and resale of the shares of Common Stock underlying the Existing Warrants (the “Existing Warrant Shares”) were registered pursuant to our registration statements on Form S-1 (File Nos. 333-282045 and 333-283521), respectively

In consideration of the Warrant Inducement Holders’ immediate exercise of the Existing Warrants (the “Existing Warrant Exercise”), at the exercise price of \$0.23 per share in accordance with the Inducement Agreement, we issued to the Warrant Inducement Holders new warrants to purchase an aggregate of 1,430,000 shares of Common Stock, at an exercise price of \$0.352 per share. The Inducement Warrants will not become exercisable until our stockholders approve the issuance of shares of Common Stock upon exercise of the Inducement Warrants in excess of 19.99% of the Common Stock outstanding on the closing date (the “Stockholder Approval”). Following Stockholder Approval, the Inducement Warrants have a term of five years.

We agreed in the Inducement Agreement to file a registration statement on Form S-1 to register the resale of the Inducement Warrant Shares as soon as practicable (and in any event within 15 calendar days following the date of the Inducement Agreement) and to use commercially reasonable efforts to have such registration statement effective at all times until no Inducement Warrant Holder owns any Inducement Warrants or Inducement Warrant Shares.

In connection with the transactions contemplated in the Inducement Agreement, we entered into an Advisory Agreement with WallachBeth. Pursuant to the terms of the Advisory Agreement, we agreed to pay WallachBeth a cash fee equal to 7.5% of the total proceeds from the exercise of the Existing Warrants. In addition, we agreed to issue to WallachBeth warrants 33,000 shares of Common Stock. We also agreed to reimburse WallachBeth for its actual and out-of-pocket expenses up to a maximum amount of \$15,000.

August 2025 Private Placement

On August 13, 2025, we entered into the Purchase Agreement by and between the Company and the Investors, pursuant to which we issued to the Investors in the August 2025 Private Placement, (i) 990 shares of the Series B Preferred Stock, convertible into 4,304,343 Conversion Shares of Common Stock, at an initial conversion price of \$0.23 per share and (ii) warrants (the “Private Warrants”) to purchase up to 6,714,780 shares of the Company’s Common Stock at an exercise price of \$0.352 per share of Common Stock.

We received aggregate gross proceeds from the August 2025 Private Placement of approximately \$1.2 million, before deducting fees payable to WallachBeth as placement agent and other estimated offering expenses payable by us. The issuance of the Series B Preferred Stock, the Conversion Shares, the Private Warrants and the Private Warrant Shares were not registered under the Securities Act. The Private Warrants will be exercisable commencing on the effective date of stockholder approval of the issuance of the Private Warrant Shares issuable upon exercise of the Private Warrants (the “Private Warrant Stockholder Approval Date” and together with the Inducement Stockholder Approval Date, the “Stockholder Approval Date”) and will expire on the fifth anniversary of the Private Warrant Stockholder Approval Date.

WallachBeth acted as the placement agent on a “reasonable best efforts” basis in connection with the August 2025 Private Placement and pursuant to the Placement Agency Agreement and received a cash fee of 7.5% of the aggregate purchase price paid by the Investors in the August 2025 Private Placement and reimbursement of certain out-of-pocket expenses up to a maximum of \$65,000. As additional compensation to WallachBeth, in connection with the August 2025 Private Placement, we issued the Placement Agent Warrants to purchase an aggregate of 129,130 shares of Common Stock, at an exercise price per share equal to \$0.352. The Placement Agent Warrants have substantially the same terms as the Private Warrants, including that the Placement Agent Warrants have an exercise price equal to \$0.352 per share, except that they were immediately exercisable upon issuance and expire on the five-year anniversary of the date of issuance.

Pursuant to the Registration Rights Agreement, we agreed to file a resale registration statement on Form S-1 to register the resale of the Private Warrant Shares as soon as practicable (and in any event within 15 calendar days following the date of the Registration Rights Agreement), and to use commercially reasonable efforts to have such registration statement declared effective by the Commission and to keep such registration statement effective at all times until the Investors no longer own any Series B Preferred Stock, Conversion Shares, Private Warrants or Private Warrant Shares. Pursuant to the Placement Agency Agreement, the Company agreed to file a resale registration statement on Form S-1 to register the resale of the Placement Agent Warrant Shares.

Terms of the Inducement Warrants and the Private Warrants

The Inducement Warrants and the Private Warrants (collectively, the “August Warrants”) are exercisable commencing on the effective date of the Stockholder Approval Date and will expire on the fifth anniversary of the Stockholder Approval Date. We have agreed to hold a special meeting of stockholders at the earliest practicable date after the August Closing Date for the purpose of obtaining Stockholder Approval (as defined below), if required to effect the purpose thereof, with the recommendation of the Company’s Board of Directors that such proposal be approved, and we shall solicit proxies from our stockholders in connection therewith in the same manner as all other management proposals in such proxy statement and all management-appointed proxyholders shall vote their proxies in favor of such proposal. We agreed to use our reasonable best efforts to obtain such Stockholder Approval, and request that our officers and directors, cast their proxies in favor of such proposal. “Stockholder Approval” means such approval as may be required by the applicable rules and regulations of The Nasdaq Stock Market LLC (or any successor entity) from the stockholders of the Company to consent to any exercise of the August Warrants and issuance of the shares of Common Stock upon exercise of the August Warrants (the “August Warrant Shares”).

If at any time after the later of (i) the six-month anniversary of August 13, 2025, or (ii) the Stockholder Approval Date, a registration statement registering the issuance of the August Warrants Shares under the Securities Act is not effective or available, the holder may, in its sole discretion, elect to exercise the August Warrants through a cashless exercise, in which case the holder would receive upon such exercise the net number of shares of Common Stock determined according to the formula set forth in the August Warrants.

The exercise price of the August Warrants, and the number of August Warrants Shares, is subject to adjustment in the event of any stock dividend or split, reverse stock split, recapitalization, reorganization or similar transaction, as described in the August Warrants.

A holder does not have the right to exercise any portion of the August Warrants if the holder (together with its affiliates) would beneficially own in excess of 4.99% (or, upon election of the holder, 9.99%) of the number of shares of our Common Stock outstanding immediately after giving effect to the exercise, as such percentage ownership is determined in accordance with the terms of such warrants. However, any holder may increase or decrease such percentage, provided that any increase will not be effective until the 61st day after such election.

In the event of a Fundamental Transaction (as such term is defined in the August Warrants), then the successor entity will succeed to, and be substituted for the Company, and may exercise every right and power that the Company may exercise and will assume all of its obligations under the August Warrants with the same effect as if such successor entity had been named in the warrant itself. If holders of Common Stock are given a choice as to the securities, cash or property to be received in a Fundamental Transaction, then the holder shall be given the same choice as to the consideration it receives upon any exercise of the August Warrants following such Fundamental Transaction. In addition, the successor entity, at the request of holders of the August Warrants, will be obligated to purchase any unexercised portion of the August Warrants in accordance with the terms thereof. Notwithstanding the foregoing, in the event of a Fundamental Transaction, the holders of the August Warrants have the right to require the Company or a successor entity to redeem the August Warrants for cash in the amount of the Black Scholes Value (as defined in the August Warrants) of the unexercised portion of the August Warrants concurrently with or within 30 days following the consummation of a Fundamental Transaction. However, in the event of a Fundamental Transaction which is not in our control, including a Fundamental Transaction not approved by the Company’s Board of Directors, the holders of the August Warrants will only be entitled to receive from the Company or its successor entity, as of the date of consummation of such Fundamental Transaction, the same type or form of consideration (and in the same proportion), at the Black Scholes Value of the unexercised portion of the August Warrants that is being offered and paid to the holders of Common Stock in connection with the Fundamental Transaction, whether that consideration is in the form of cash, stock or any combination of cash and stock, or whether the holders of our Common Stock are given the choice to receive alternative forms of consideration in connection with the Fundamental Transaction.

Except as otherwise provided in the August Warrants or by virtue of such holder’s ownership of shares of our Common Stock, the holder of an August Warrant will not have the rights or privileges of a holder of our Common Stock, including any voting rights, until the holder exercises such warrant.

ANTI-DILUTION ADJUSTMENTS TO MAY 2025 WARRANTS

On May 7, 2025 we consummated a best efforts public offering of an aggregate of (i) 7,784,904 shares of Common Stock, par value \$0.007 per share, (ii) pre-funded warrants to purchase up to 2,371,346 shares of Common Stock in lieu of shares, and (iii) May 2025 Warrants to purchase up to 15,234,375 shares of Common Stock (which number of May 2025 Warrant Shares is equal to 150% of the aggregate number of shares and pre-funded Warrants sold in the Offering). Each share and accompanying May 2025 Warrant was sold at a combined public offering price of \$0.32. Each pre-funded warrant and accompanying May 2025 Warrant was sold at a combined public offering price of \$0.313.

The May 2025 Warrants contain an anti-dilution adjustment provision, pursuant to which, upon consummation of a Dilutive Issuance (as such term is defined in the May 2025 Warrants) the exercise price of the May 2025 Warrants would be reduced to a minimum price of \$0.10 per share and, upon a reduction in the exercise price, the number of shares of Common Stock issuable upon exercise of the May 2025 Warrants was correspondingly increased.

USE OF PROCEEDS

The Selling Stockholders will receive all of the proceeds of the sale of shares of Common Stock offered from time to time pursuant to this prospectus. Accordingly, we will not receive any proceeds from the sale of shares of Common Stock that may be sold from time to time pursuant to this prospectus; however, we will receive proceeds from the conversion of Series B Preferred Stock and/or cash exercise of the Common Warrants. We currently intend to use these net proceeds for general corporate purposes, which may include operating expenses, research and development, including clinical and pre-clinical testing of our product candidates, working capital, future acquisitions and general capital expenditures. We have not determined the amount of net proceeds to be used specifically for any of such purposes.

The expected use of net proceeds from the conversion of the Series B Preferred Stock and/or cash exercise of the Common Warrants represents our intentions based upon our current plans and business conditions, which could change in the future as our plans and business conditions evolve and change. The amounts and timing of our actual expenditures, specifically with respect to working capital, may vary significantly depending on numerous factors. As a result, our management will retain broad discretion over the allocation of the net proceeds from this offering. We have no current agreements, commitments or understandings for any material acquisitions or licenses of any products, businesses or technologies that are definitive or probable to close.

We will bear the out-of-pocket costs, expenses and fees incurred in connection with the registration of shares of our Common Stock to be sold by the Selling Stockholders pursuant to this prospectus. Other than registration expenses, the Selling Stockholders will bear any underwriting discounts, commissions, placement agent fees or other similar expenses payable with respect to sales of shares of our Common Stock.

SELLING STOCKHOLDERS

The shares of Common Stock being offered by the Selling Stockholders are those issuable to the Investors, the Inducement Warrant Holders and the May 2025 Warrant Holders upon exercise of the Common Warrants and those issuable to designees of WallachBeth upon exercise of the Placement Agent Warrants and the Inducement Advisor Warrants. For additional information regarding the issuances of the Common Warrants, see “The Private Placements” above. We are registering the shares of Common Stock in order to permit the Selling Stockholders to offer the shares of Common Stock for resale from time to time.

The table below lists the Selling Stockholders and provides information regarding their beneficial ownership of shares of Common Stock by each of the Selling Stockholders. The second column lists the number of shares of Common Stock beneficially owned by the Selling Stockholders, based on their ownership of the shares of Common Stock, the Common Warrants and shares of Common Stock issuable upon exercise of warrants acquired in offerings prior to the transactions described in the section entitled, “The Private Placements,” as of September 10, 2025, assuming exercise of the Common Warrants held by the Selling Stockholders on that date, without regard to any limitations on exercises. The third column lists the maximum number of shares of Common Stock being offered by this prospectus by the Selling Stockholders, also without regard to any limitations on exercises.

In accordance with the terms of the August Purchase Agreement, the Inducement Agreement, the May 2025 Warrants and the Placement Agency Agreement, this prospectus generally covers the resale of the maximum number of shares of Common Stock issuable upon exercise of the Common Warrants, determined as if the outstanding Common Warrants were exercised in full as of the trading day immediately preceding the date this registration statement was initially filed with the SEC, each as of the trading day immediately preceding the applicable date of determination and all subject to adjustment as provided in the Registration Right Agreement, without regard to any limitations on the exercise of the Common Warrants and the Placement Agent Warrants. The fourth and fifth columns assume the sale of all of the shares offered by the Selling Stockholders pursuant to this prospectus.

Under the terms of the Common Warrants, the Selling Stockholders may not exercise the Common Warrants to the extent such exercise would cause such Selling Stockholder, together with its affiliates and attribution parties, to beneficially own a number of shares of Common Stock that would exceed 4.99%, of our then-outstanding Common Stock following such exercise, excluding for purposes of such determination shares of Common Stock issuable upon exercise of such warrants which have not been exercised. The number of shares in the second, third and fourth columns do not reflect this limitation, but the percentages set forth in the fifth column do not give effect to such limitation. The Selling Stockholders may sell all, some or none of their shares in this offering. See “Plan of Distribution.”

Name of Selling Stockholders	Number of Shares of Common Stock Beneficially Owned Prior to Offering⁽¹⁾	Maximum Number of Shares of Common Stock to be Sold in this Offering⁽¹⁾	Number of Shares of Common Stock Beneficially Owned After Offering	Percentage of Shares Beneficially Owned after Offering⁽¹⁾
Funds managed by Empery Asset Management, LP ⁽³⁾	13,227,469	7,742,500	11,797,469	4.99%
Alta Partners LLC ⁽⁴⁾	3,319,564	2,616,439	703,125	4.99%
Bigger Capital Fund, LP ⁽⁵⁾	8,166,220	4,825,814	3,340,406	4.99%
Mark Graber ⁽⁶⁾	2,101,738	1,632,988	468,750	4.99%
Intracoastal Capital LLC ⁽⁷⁾	8,192,173	5,307,608	2,884,565	4.99%
Richard K. Crumly ⁽⁸⁾	6,777,091	3,563,314	3,213,777	4.99%
District 2 Capital Fund LP ⁽⁹⁾	8,203,719	4,825,814	3,377,905	4.99%
Warberg WF XIII LP ⁽¹⁰⁾	2,522,146	1,819,021	703,125	4.99%
Douglas Bantum ⁽¹¹⁾	-	62,420	-	*
Gene McNeil ⁽¹¹⁾	-	13,376	-	*
Kenneth Bantum ⁽¹¹⁾	-	13,376	-	*
Michael Wallach ⁽¹¹⁾	-	36,479	-	*
David Beth ⁽¹¹⁾	-	36,479	-	*

* Ownership of less than 1%.

(1) The Common Warrants are subject to a beneficial ownership limitation of 4.99%, which in each case restricts the Investor Selling Stockholders from exercising that portion of the warrants that would result in the Investor Selling Stockholders and their affiliates owning, after exercise, a number of shares of Common Stock in excess of the beneficial ownership limitation. The number of shares set forth in the above table does not reflect the application of this limitation.

- (2) Based on 29,568,612 shares of Common Stock outstanding as of September 10, 2025.
- (3) The shares listed in the third column consist of Common Warrants to purchase an aggregate of 7,742,500 shares of Common Stock consisting of (1) 3,569,214 shares of Common Stock issuable upon exercise of Common Warrants held by Empery Asset Master, LTD (“EAM”); (2) 313,106 shares of Common Stock issuable upon exercise of Common Warrants held by Empery Tax Efficient, LP (“ETE”); and (3) 3,860,180 shares of Common Stock issuable upon exercise of Common Warrants held by Empery Tax Efficient III, LP (“ETE III” and collectively with EAM and ETE, the “Empery Funds”). The shares listed in the second column represent (i) the aforementioned shares, (ii) 797,469 shares of common stock held by the Empery Funds and (iii) 4,687,500 shares of Common Stock issuable upon exercise of common stock purchase warrants held by the Empery Funds that were initially issued as registered securities and are not being registered for resale hereunder. Empery Asset Management LP, the authorized agent of each of the Empery Funds, has discretionary authority to vote and dispose of the shares held by the Empery Funds and may be deemed to be the beneficial owner of these shares. Martin Hoe and Ryan Lane, in their capacity as investment managers of Empery Asset Management LP, may also be deemed to have investment discretion and voting power over the shares held by the Empery Funds. Each of the Empery Funds, Mr. Hoe and Mr. Lane each disclaim any beneficial ownership of these shares. The business address of Empery Asset Management, LP is 1 Rockefeller Plaza, Suite 1205, New York, New York 10020.
- (4) The shares listed in the third column consist of (i) 652,173 shares of Common Stock issuable upon conversion of 150 shares of Series B Preferred Stock, (ii) 1,017,391 shares of Common Stock issuable upon exercise of Private Warrants and (iii) 946,875 shares of Common Stock issuable upon exercise of the May 2025 Warrants. The shares listed in the second column consist of the (i) aforementioned shares and (ii) 703,125 shares of Common Stock issuable upon exercise of common stock purchase warrants that were initially issued as registered securities and are not being registered for resale hereunder. Steven Cohen is the managing member of Alta Partners LLC and has voting control and investment discretion over securities beneficially owned directly by Alta Partners LLC and has voting control and investment discretion over securities beneficially owned directly by Alta Partners LLC. In such role, Mr. Cohen may be deemed to beneficially own the securities owned by Alta Partners LLC. We have been advised that none of Mr. Cohen or Alta Partners LLC is a member of the Financial Industry Regulatory Authority, or FINRA, or an independent broker-dealer, an affiliate or associated person of a FINRA member, or an affiliate of a broker-dealer. The foregoing should not be construed in and of itself as an admission by Mr. Cohen or Alta Partners LLC as to beneficial ownership of the securities beneficially owned directly by Alta Partners LLC. The business address of Alta Partners LLC 1205 Franklin Avenue, Suite 320, Garden City, NY 11530.
- (5) The shares listed in the third column consist of (i) 652,173 shares of Common Stock issuable upon conversion of 150 shares of Series B Preferred Stock, (ii) 1,017,391 shares of Common Stock issuable upon exercise of Private Warrants and (iii) 3,156,250 shares of Common Stock issuable upon exercise of the May 2025 Warrants. The shares listed in the second column consist of (i) the aforementioned shares and (ii) 3,340,406 shares of Common Stock issuable upon exercise of common stock purchase warrants that were initially issued as registered securities and are not being registered for resale hereunder. Michael Bigger is the managing member of Bigger Capital Fund, LP and has voting control and investment discretion over securities beneficially owned directly by Bigger Capital Fund, LP and has voting control and investment discretion over securities beneficially owned directly by Bigger Capital Fund, LP. In such role, Mr. Bigger may be deemed to beneficially own the securities owned by Bigger Capital Fund, LP. We have been advised that none of Mr. Bigger or Bigger Capital Fund, LP is a member of the Financial Industry Regulatory Authority, or FINRA, or an independent broker-dealer, an affiliate or associated person of a FINRA member, or an affiliate of a broker-dealer. The foregoing should not be construed in and of itself as an admission by Mr. Bigger or Bigger Capital Fund, LP as to beneficial ownership of the securities beneficially owned directly by Bigger Capital Fund, LP. The business address of Bigger Capital Fund, LP is 11700 W Charleston Blvd. 170-659, Las Vegas, NV 89135.
- (6) The shares listed in the third column consist of (i) 391,304 shares of Common Stock issuable upon conversion of 90 shares of Series B Preferred Stock, (ii) 610,434 shares of Common Stock issuable upon exercise of Private Warrants and (iii) 631,250 shares of Common Stock issuable upon exercise of the May 2025 Warrants. The shares listed in the second column consist of (i) the aforementioned shares and (ii) 468,750 shares of Common Stock issuable upon exercise of common stock purchase warrants that were initially issued as registered securities and are not being registered for resale hereunder. Mr. Graber has voting control and investment discretion over securities beneficially owned. In such role, We have been advised that Mr. Graber is not a member of the Financial Industry Regulatory Authority, or FINRA, or an independent broker-dealer, an affiliate or associated person of a FINRA member, or an affiliate of a broker-dealer. The business address of Mr. Graber is 56 Oakwell Farms Pkwy, San Antonio, TX 78218.

- (7) The shares listed in the third column consist of (i) 1,086,956 shares of Common Stock issuable upon conversion of 250 shares of Series B Preferred Stock, (ii) 1,695,652 shares of Common Stock issuable upon exercise of Private Warrants, and (iii) 2,525,000 shares of Common Stock issuable upon exercise of the May 2025 Warrants. The shares listed in the second column consist of (i) the aforementioned shares and (ii) 2,884,565 shares of Common Stock issuable upon exercise of common stock purchase warrants that were initially issued as registered securities and are not being registered for resale hereunder. Mitchell P. Kopin is the managing member of Intracoastal Capital, LLC and has voting control and investment discretion over securities beneficially owned directly by Intracoastal Capital, LLC and has voting control and investment discretion over securities beneficially owned directly by Intracoastal Capital, LLC. In such role, Mr. Kopin may be deemed to beneficially own the securities owned by Intracoastal Capital, LLC. We have been advised that none of Mr. Kopin or Intracoastal Capital, LLC is a member of the Financial Industry Regulatory Authority, or FINRA, or an independent broker-dealer, an affiliate or associated person of a FINRA member, or an affiliate of a broker-dealer. The foregoing should not be construed in and of itself as an admission by Mr. Kopin or Intracoastal Capital, LLC as to beneficial ownership of the securities beneficially owned directly by Intracoastal Capital, LLC. The business address of Intracoastal Capital, LLC is 245 Palm Trail, Delray Beach, Florida 33483.
- (8) The shares listed in the third column consist of (i) 652,173 shares of Common Stock issuable upon conversion of 150 shares of Series B Preferred Stock (ii) 1,017,391 shares of Common Stock issuable upon exercise of Private Warrants and (iii) 1,893,750 shares of Common Stock issuable upon exercise of the May 2025 Warrants. The shares listed in the second column consist of (i) the aforementioned shares and (ii) 3,213,777 shares of Common Stock issuable upon exercise of common stock purchase warrants that were initially issued as registered securities and are not being registered for resale hereunder. Mr. Crumly has voting control and investment discretion over securities beneficially owned. In such role, We have been advised that Mr. Graber is not a member of the Financial Industry Regulatory Authority, or FINRA, or an independent broker-dealer, an affiliate or associated person of a FINRA member, or an affiliate of a broker-dealer. The business address of Mr. Crumly is P.O. Box 1381, Austin, Texas 78767.
- (9) The shares listed in the third column consist of (i) 652,173 shares of Common Stock issuable upon conversion of 150 shares of Series B Preferred Stock, (ii) 1,017,391 shares of Common Stock issuable upon exercise of Private Warrants and (iii) 3,156,250 shares of Common Stock issuable upon exercise of the May 2025 Warrants. The shares listed in the second column consist of (i) the aforementioned shares and (ii) 3,377,905 shares of Common Stock issuable upon exercise of common stock purchase warrants that were initially issued as registered securities and are not being registered for resale hereunder. Michael Bigger is the managing member of District 2 Capital Fund LP and has voting control and investment discretion over securities beneficially owned directly by District 2 Capital Fund LP. In such roles, Mr. Bigger may be deemed to beneficially own the securities owned by District 2 Capital Fund LP. We have been advised that none of Mr. Bigger or District 2 Capital Fund LP is a member of the Financial Industry Regulatory Authority, or FINRA, or an independent broker-dealer, an affiliate or associated person of a FINRA member, or an affiliate of a broker-dealer. The foregoing should not be construed in and of itself as an admission by Mr. Bigger as to beneficial ownership of the securities beneficially owned directly by District 2 Capital Fund LP. The business address of District 2 Capital Fund LP is 14 Wall Street, 2nd Floor, Huntington NY 11743.
- (10) The shares listed in the third column consist of (i) 217,391 shares of Common Stock issuable upon conversion of 50 shares of Series B Preferred Stock, (ii) 339,130 shares of Common Stock issuable upon exercise of Private Warrants and (iii) 1,262,500 shares of Common Stock issuable upon exercise of the May 2025 Warrants. The shares listed in the second column consist of (i) the aforementioned shares and (ii) 703,125 shares of Common Stock issuable upon exercise of common stock purchase warrants owned by Warberg WF XII LP that were initially issued as registered securities and are not being registered for resale hereunder. Daniel Warsh is the principal of the general partner of Warberg WF XII LP and has voting control and investment discretion over securities beneficially owned directly by Warberg WF XIII LP. In such roles, Mr. Warsh may be deemed to beneficially own the securities owned by Warberg WF XIII LP. We have been advised that none of Mr. Warsh, Warberg XII LP or Warberg WF XIII LP is a member of the Financial Industry Regulatory Authority, or FINRA, or an independent broker-dealer, an affiliate or associated person of a FINRA member, or an affiliate of a broker-dealer. The foregoing should not be construed in and of itself as an admission by Mr. Warsh as to beneficial ownership of the securities beneficially owned directly by Warberg WF XIII LP. The business address of Warberg WF XIII LP is 716 Oak Street, Winnetka, IL 60093.
- (11) Each of these Selling Stockholders is a designee of, and is affiliated with, WallachBeth Capital LLC. WallachBeth Capital, LLC is a registered broker-dealer and has a registered address of c/o WallachBeth Capital, LLC, 1001 Yamato Road, Suite 404, Boca Raton, Florida 33431. The number of shares listed in the third column, which are the shares to be sold in this offering, consist of the shares of Common Stock issuable upon exercise of the Placement Agent Warrants and the Inducement Advisor Warrants. WallachBeth Capital, LLC and its designees acquired the Placement Agent Warrants in the ordinary course of business and, at the time the Placement Agent Warrants and the Inducement Advisor Warrants were acquired, neither WallachBeth Capital, LLC nor its designees had any agreement or understanding, directly or indirectly, with any person to distribute such securities.

DESCRIPTION OF SECURITIES

Authorized Capital Stock

We are currently authorized to issue up to 350,000,000 shares of Common Stock, par value \$0.007 per share, and 20,000,000 shares of Preferred Stock, par value \$0.001 per share. As permitted by the Company's Charter, the Company has designated (i) 5,400,000 shares of Preferred Stock as "Series A Convertible Preferred Stock," par value \$0.001 per share (the "Series A Preferred Stock"), of which no shares are outstanding, and (ii) 990 shares of Preferred Stock as "Series B Convertible Preferred Stock," par value \$0.001 per share (the "Series B Preferred Stock"), of which 990 shares are outstanding.

Common Stock

Voting Rights

Holders of our Common Stock are entitled to cast one vote for each share held of record on all matters presented to the stockholders. Holders of our Common Stock have no cumulative voting rights.

Dividend Rights

The Board is not obligated to declare a dividend, has never declared or paid cash dividends on its Common Stock, and does not anticipate paying dividends on our Common Stock for the foreseeable future.

Rights upon Liquidation

In the event of our liquidation, dissolution, or winding up, either voluntary or involuntary, subject to the rights and preferences that may apply to any shares of Preferred Stock outstanding at the time, the assets or surplus funds legally available for distribution to our stockholders would be distributable ratably among the Common Stockholders based on the number of shares of Common Stock held by each such holder, subject to prior satisfaction of all outstanding debt and liabilities.

No Preemptive or Similar Rights

Holders of our Common Stock are not entitled to preemptive rights to subscribe to additional shares if issued. Our Common Stock is not subject to any redemption or sinking-fund provisions. All outstanding shares of our Common Stock are fully paid and non-assessable.

Series A Preferred Stock

Voting Rights

Holders of the shares of Series A Preferred Stock have the right to one vote for each share of Common Stock into which such Series A Preferred Stock could then be converted. In addition, for so long as 30% of the shares of Series A Preferred Stock remain outstanding, the Series A Preferred Stockholders, voting together as a single class, may exercise the Series A Director Designation Right, pursuant to which they are entitled to elect one director of the Company as the Series A Representative. Any Series A Representative elected by the holders of Series A Preferred Stock may be removed from office only by the Series A Preferred Stockholders, and any vacancy of a Series A Representative may be filled only by the holders of the Series A Preferred Stock. If at any time fewer than 30% of the shares of Series A Preferred Stock remain outstanding, then the director position previously held by the Series A Representative will be elected by all of the holders of Preferred Stock and Common Stock acting together.

Dividend Rights

Holders of shares of the Series A Preferred Stock are entitled to receive dividends, in preference to any declaration or payment of a dividend to holders of the Common Stock, of 8% per share per annum when, as and if declared by the Board. Such dividends are not cumulative. See “Description of Securities-Dividend Policy” below.

Rights Upon Liquidation

In the event of any liquidation, dissolution or similar event, the holders of shares of Series A Preferred Stock are entitled to receive in preference to any distribution of any of the assets of the Company to the holders of the Common Stock, \$7.70 per share (subsequent to the reverse-stock-split calculation). Unless otherwise decided by holders of a majority of the Preferred Stock outstanding, a liquidation includes a sale of substantially all of the assets of the Company and a merger, unless such merger is solely for the purpose of changing the Company’s state of incorporation or a majority of the voting power of the surviving entity will be owned by persons who were stockholders of the Company prior to the merger. Holders of shares of Preferred Stock will not participate with the holders of Common Stock in the distribution of the remainder of the Company’s assets.

Conversion Rights

Shares of Series A Preferred Stock are convertible, at the option of the holder thereof, into shares of Common Stock at any time. Shares of Series A Preferred Stock are automatically converted into shares of Common Stock following the closing of an underwritten initial public offering of our Common Stock in which at least \$10,000,000 in shares of Common Stock are sold at a price of \$3.00 per share or more on such other date as agreed to by a holders of the majority of the outstanding shares of Series A Preferred Stock. The holders of a more than a majority of our outstanding shares of Series A Preferred Stock executed a written consent such that all of the issued and outstanding shares of Series A Preferred Stock automatically converted into fully paid and nonassessable shares of Common Stock immediately prior to the closing of the initial public offering at the then-effective conversion rate of the Series A Preferred Stock. The conversion rate of Series A Preferred Stock into Common Stock is initially 1 for 7 (as adjusted for the 1-for-7 reverse stock split) but is subject to further adjustment in the event of a stock split, stock dividend or similar event.

Following the automatic conversion of the Series A Preferred Stock shares into Common Stock immediately prior to the closing of our initial public offering, the Company does not intend to issue any further shares of Series A Preferred Stock. Furthermore, the Series A Director Designation Right ceased to exist because no shares of Series A Preferred Stock are outstanding. The director who served as the Series A Representative, Gary Rubin, stepped down from the Board in August 2025 for personal reasons. The number of Board seats for election by the holders of the Common Stock was expanded by one so that the director position that the holders of the Series A Preferred Stock were previously entitled to elect will be subject to election by the holders of the Common Stock following the conversion of the Series A Preferred Stock into Common Stock.

Series B Preferred Stock

Voting Rights

Except as otherwise required by law, holders of Series B Preferred Stock shall not be entitled to any voting rights.

Dividends Rights

The holders of Series B Preferred Stock shall be entitled to receive dividends on shares of Series B Preferred Stock equal (on an as-if-converted-to-Common-Stock basis) to and in the same form as dividends actually paid on shares of the Common Stock when, as and if such dividends are paid on shares of the Common Stock.

Conversion

The Series B Preferred Stock will be convertible into shares of Common Stock at an initial conversion price of \$0.23 per share (the “Conversion Price”). Each share of Series B Preferred Stock shall be convertible into such number of shares of Common Stock that results from dividing the Stated Value by the Conversion Price.

Limitations on Conversion

Holders of Series B Preferred Stock are prohibited from converting shares of Series B Preferred Stock into shares of Common Stock if, as a result of such conversion, such holder, together with its affiliates, would beneficially own in excess of 4.99% of the total number of shares of Common Stock issued and outstanding immediately after giving effect to such conversion.

Compliance with Rules of Principal Market

The Company will be prohibited from issuing any shares of Common Stock upon conversion of the Series B Preferred Stock if after giving effect to such issuance, the aggregate number of Conversion Shares issued under this Agreement would exceed 19.99% of the aggregate number of shares of Common Stock issued and outstanding as of the execution date of the Purchase Agreement until such time as the Company obtains stockholder approval of such issuances (the “Preferred Stockholder Approval”).

Adjustment Upon Issuance of Common Stock

If and whenever on or after the date on which the Company obtains the Preferred Stockholder Approval, the Company is deemed to have issued or sold any shares of Common Stock for a consideration per share less than the Conversion Price, the Conversion Price will be reduced to such new issuance price subject to a floor price of \$0.10.

Warrants

As of September 10, 2025, we have outstanding warrants to purchase an aggregate of 55,820,963 shares of Common Stock, with a weighted average exercise price equal to \$0.75 per share, which includes Tradeable Warrants and Non-Tradeable Warrants that we issued in connection with our initial public offering to purchase an aggregate of 4,305,713 shares of Common Stock, all of which have an exercise price of \$3.0625 per share.

Stock Options

As of September 10, 2025, we had outstanding options to purchase an aggregate of 271,987 shares of Common Stock, with a weighted average exercise price equal to \$7.05 per share.

Exchange Listing

Our Common Stock and the Tradeable Warrants trade on The Nasdaq Capital Market under the symbols “BIAF” and “BIAFW,” respectively.

Dividend Policy

We have never declared or paid cash dividends on our capital stock. We currently intend to retain all available funds and any future earnings for use in the operation and expansion of our business. We do not anticipate paying any cash dividends in the foreseeable future, and it is unlikely that investors will derive any current income from ownership of our stock.

Anti-Takeover Effects of Delaware Law and Provisions of Our Charter and A&R Bylaws

Certain provisions of the Delaware General Corporation Law (“DGCL”) and of our Charter and our A&R Bylaws could have the effect of delaying, deferring or discouraging another party from acquiring control of us. These provisions, which are summarized below, are expected to discourage certain types of coercive takeover practices and inadequate takeover bids and, as a consequence, they might also inhibit temporary fluctuations in the market price of our Common Stock that often result from actual or rumored hostile takeover attempts. These provisions are also designed in part to encourage anyone seeking to acquire control of us to first negotiate with our Board. These provisions might also have the effect of preventing changes in our Board or management. It is possible that these provisions could make it more difficult to accomplish transactions that stockholders might otherwise deem to be in their best interests. However, we believe that the advantages gained by protecting our ability to negotiate with any unsolicited and potentially unfriendly acquirer outweigh the disadvantages of discouraging such proposals, including those priced above the then-current market value of our Common Stock, because, among other reasons, the negotiation of such proposals could improve their terms.

Delaware Anti-Takeover Statute

We are subject to the provisions of Section 203 of the DGCL. In general, Section 203 prohibits a publicly held Delaware corporation from engaging in a “business combination” with an “interested stockholder” for a three-year period following the time that this stockholder becomes an interested stockholder, unless the business combination is approved in a prescribed manner. Under Section 203, a business combination between a corporation and an interested stockholder is prohibited unless it satisfies one of the following conditions:

- before the stockholder became interested, the corporation’s Board of Directors approved either the business combination or the transaction that resulted in the stockholder becoming an interested stockholder;
- upon consummation of the transaction that resulted in the stockholder becoming an interested stockholder, the interested stockholder owned at least 85% of the voting stock of the corporation outstanding at the time the transaction commenced, excluding for purposes of determining the voting stock outstanding, shares owned by persons who are directors and also officers, and employee stock plans, in some instances, but not the outstanding voting stock owned by the interested stockholder; or
- at or after the time the stockholder became interested, the business combination was approved by the corporation’s Board of Directors and authorized at an annual or special meeting of the stockholders by the affirmative vote of at least two-thirds of the outstanding voting stock that is not owned by the interested stockholder.

In general, Section 203 defines a “business combination” to include mergers, asset sales and other transactions resulting in financial benefit to a stockholder, and an “interested stockholder” as a person who, together with affiliates and associates, owns, or within three years did own, 15% or more of the corporation’s outstanding voting stock. These provisions may have the effect of delaying, deferring or preventing changes in control of our Company.

Provisions of Our Charter and A&R Bylaws

Our Charter and A&R Bylaws include a number of provisions that may have the effect of delaying, deferring, or discouraging another party from acquiring control of us and encouraging persons considering unsolicited tender offers or other unilateral takeover proposals to negotiate with our Board rather than pursue non-negotiated takeover attempts. These provisions will include the items described below.

Director Vacancies

Our A&R Bylaws authorize the Board to fill vacant directorships and provide that the number of directors constituting our Board may be set by resolution of the incumbent directors.

Special Meetings of Stockholders

Our A&R Bylaws provide that special meetings of our stockholders may only be called pursuant to a resolution approved by the Board. The only business that may be conducted at a special meeting of our stockholders is the matter or matters set forth in the notice of such special meeting.

Prohibition of Stockholder Action by Written Consent

Our Charter and A&R Bylaws prohibit stockholder action by written consent, thereby requiring all stockholder actions to be taken at a meeting of our stockholders.

Advance Notice Requirements

Our A&R Bylaws establish advance notice requirements for nominations for election to the Board of Directors or for proposing matters that can be acted upon at stockholder meetings. To be timely, a stockholder's notice will need to be received by the Company secretary at our principal executive offices (i) not later than the close of business on the 90th day nor earlier than the close of business on the 120th day prior to the anniversary date of the immediately preceding annual meeting of stockholders (if such meeting is to be held on a day which is not more than 30 days in advance of the anniversary of the previous year's annual meeting or not later than 60 days after the anniversary of the previous year's annual meeting), or (ii) with respect to any other annual meeting of stockholders, including in the event that no annual meeting was held in the previous year, not earlier than the close of business on the 120th day prior to the annual meeting and not later than the close of business on the later of: (1) the 90th day prior to the annual meeting and (2) the close of business on the tenth day following the first date that the date of such meeting was disclosed in a press release reported by the Dow Jones News Services, The Associated Press, or a comparable national news service or in a document filed by the Company with the SEC pursuant to the Exchange Act. Our A&R Bylaws also specify certain requirements as to the form and content of a stockholders' meeting. These provisions may preclude our stockholders from bringing matters before our annual meeting of stockholders or from making nominations for directors at our annual meeting of stockholders.

Amendment to Charter and A&R Bylaws

As required by the DGCL, any amendment of our Charter must first be approved by a majority of our Board, and if required by law or our Charter, must thereafter be approved by a majority of the outstanding shares entitled to vote on the amendment, and a majority of the outstanding shares of each class entitled to vote thereon as a class. Our A&R Bylaws provide for amendment of the A&R Bylaws by a majority of our Board or by a majority of the outstanding shares entitled to vote on the amendment.

Exclusive Forum

Both our Charter and our A&R Bylaws contain exclusive forum provisions that provide that unless we consent in writing to the selection of an alternative forum, the Court of Chancery of the State of Delaware shall be the sole and exclusive forum for any stockholder to bring (i) any derivative action or proceeding brought on behalf of the Company, (ii) any action asserting a claim of breach of fiduciary duty owed by any current or former director, officer, employee or agent of the Company to the Company or the Company's stockholders, (iii) any action asserting a claim arising pursuant to the DGCL, our Charter or A&R Bylaws (as either may be amended or restated) or as to which the DGCL confers jurisdiction on the Court of Chancery of the State of Delaware, or (iv) any action asserting a claim governed by the internal affairs doctrine of the State of Delaware. These provisions expressly do not apply to claims arising under the Exchange Act, or for any other federal securities laws which provide for exclusive federal jurisdiction. However, these exclusive forum provisions provide that unless we consent in writing to the selection of an alternative forum, the federal district courts of the United States of America will be the exclusive forum for the resolution of any complaint asserting a cause of action arising under the Securities Act. Therefore, this provision could apply to a suit that falls within one or more of the categories enumerated in the exclusive forum provision and that asserts claims under the Securities Act, inasmuch as Section 22 of the Securities Act creates concurrent jurisdiction for federal and state courts over all suits brought to enforce any duty or liability created by the Securities Act or the rules and regulations thereunder. There is uncertainty as to whether a court would enforce such an exclusive forum provision with respect to claims under the Securities Act. Stockholders cannot waive compliance with the federal securities laws and the rules and regulations thereunder. Any person or entity purchasing or otherwise acquiring or holding any interest in shares of our capital stock shall be deemed to have notice of and consented to the exclusive forum provisions in our Charter and A&R Bylaws. These exclusive forum provisions may limit a stockholder's ability to bring a claim in a judicial forum of its choosing for disputes with us or our directors, officers, employees, or agents, which may discourage lawsuits against us and our directors, officers, employees, and agents.

Limitations on Liability and Indemnification of Officers and Directors

Our Charter and our A&R Bylaws provide indemnification for our directors and officers to the fullest extent permitted by the DGCL. In addition, as permitted by Delaware law, our Charter includes provisions that eliminate the personal liability of our directors for monetary damages resulting from breaches of certain fiduciary duties as a director. The effect of these provisions is to restrict our rights and the rights of our stockholders in derivative suits to recover monetary damages against a director or officer for breach of fiduciary duties as a director or officer, subject to certain exceptions in which case the director or officer would be personally liable. An officer may not be exculpated for any action brought by or in the right of the corporation. A director may not be exculpated for improper distributions to stockholders. Further, pursuant to Delaware law a director or officer may not be exculpated for:

- any breach of his or her duty of loyalty to us or our stockholders;
- acts or omissions not in good faith or which involve intentional misconduct or a knowing violation of law; and
- any transaction from which the director or officer derived an improper personal benefit.

These limitations of liability do not apply to liabilities arising under the federal or state securities laws and do not affect the availability of equitable remedies such as injunctive relief or rescission.

Insofar as indemnification for liabilities arising under the Securities Act may be permitted to directors, officers or persons controlling us, we have been informed that, in the opinion of the SEC, such indemnification is against public policy as expressed in the Securities Act and is therefore unenforceable.

At present, there is no pending litigation or proceeding involving any of our directors or officers as to which indemnification is required or permitted, and we are not aware of any threatened litigation or proceeding that may result in a claim for indemnification.

PLAN OF DISTRIBUTION

The Selling Stockholders and any of their pledgees, assignees and successors-in-interest may, from time to time, sell any or all of its securities covered hereby on The Nasdaq Capital 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 Stockholders 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 Stockholders 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 Stockholders may also sell securities under Rule 144 or any other exemption from registration under the Securities Act, if available, rather than under this prospectus.

Broker-dealers engaged by the Selling Stockholders may arrange for other brokers-dealers to participate in sales. Broker-dealers may receive commissions or discounts from the Selling Stockholders (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 2440; and in the case of a principal transaction, a markup or markdown in compliance with FINRA IM-2440.

In connection with the sale of the securities or interests therein, the Selling Stockholders 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 Stockholders 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 Stockholders 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 Stockholders and any broker-dealers or agents that are involved in selling the securities are “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 Stockholders have informed us that they do not have any written or oral agreement or understanding, directly or indirectly, with any person to distribute the securities.

We are required to pay certain fees and expenses incurred by us incident to the registration of the securities. We have agreed to indemnify the Selling Stockholders against certain losses, claims, damages and liabilities, including liabilities under the Securities Act.

We agreed to keep this prospectus effective until the Selling Stockholders do not own any Common Warrants or Common Warrants Shares as applicable.

Pursuant to 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 Stockholders 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 Stockholders or any other person. We will make copies of this prospectus available to the Selling Stockholders 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).

EXPERTS

The consolidated financial statements of bioAffinity Technologies, Inc. as of December 31, 2024 and 2023, and for the years ended December 31, 2024 and 2023, incorporated by reference in this prospectus and registration statement have been audited by WithumSmith+Brown, PC, independent registered public accounting firm, as set forth in their report thereon (which contains an explanatory paragraph describing conditions that raise substantial doubt about bioAffinity Technologies, Inc.'s ability to continue as a going concern as described in Note 1 to the consolidated financial statements) appearing elsewhere in the documents incorporated by reference, and are included in reliance upon such report given on the authority of such firm as experts in accounting and auditing.

LEGAL MATTERS

The validity of the securities offered hereby will be passed upon for us by Sheppard, Mullin, Richter & Hampton LLP, New York, New York.

WHERE YOU CAN FIND ADDITIONAL INFORMATION

This prospectus constitutes a part of a registration statement on Form S-1 filed under the Securities Act. As permitted by the SEC's rules, this prospectus and any prospectus supplement, which form a part of the registration statement, do not contain all the information that is included in the registration statement. You will find additional information about us in the registration statement and its exhibits. Any statements made in this prospectus or any 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.

You can read our electronic SEC filings, including such registration statement, on the internet at the SEC's website at www.sec.gov. We are subject to the information reporting requirements of the Exchange Act, and we file reports, proxy statements and other information with the SEC. These reports, proxy statements and other information will be available at the website of the SEC referred to above. We also maintain a website at <https://www.bioaffinitytech.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. However, the information contained in or accessible through our website is not part of this prospectus or the registration statement of which this prospectus forms a part, and investors should not rely on such information in making a decision to purchase our securities in this offering.

INCORPORATION OF DOCUMENTS BY REFERENCE

We have filed a registration statement on Form S-1 with the SEC under the Securities Act. This prospectus is part of the registration statement; however, 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. 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 have filed with the SEC, and incorporate by reference in this prospectus:

- Current Reports on Form 8-K, filed with the SEC on [January 14, 2025](#), [February 7, 2025](#), [February 27, 2025](#), [April 14, 2025](#), [May 8, 2025](#), [May 19, 2025](#), [May 27, 2025](#), [May 30, 2025](#), [July 25, 2025](#), [August 14, 2025](#), [August 18, 2025](#), [September 2, 2025](#), [September 3, 2025](#), [September 5, 2025](#) and [September 9, 2025](#);
- Annual Report on [Form 10-K](#) for the year ended December 31, 2024 filed with the SEC on March 31, 2025, as amended by the [Form 10-K/A](#) filed on April 29, 2025;
- Quarterly Reports on Form 10-Q for the quarterly periods ended March 31, 2025, and June 30, 2025, filed with the SEC on [May 15, 2025](#) and [August 14, 2025](#);
- Proxy Statement on Schedule 14A filed on [June 2, 2025](#); and
- The description of our Common Stock set forth in our registration statement on [Form 8-A](#) (Commission File No. 001-41463) filed with the SEC on August 23, 2022, including any amendments thereto or reports filed for the purposes of updating this description.

In addition, all documents subsequently filed by us pursuant to Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act, prior to the termination of the offering (excluding any information furnished rather than filed) shall be deemed to be incorporated by reference into this prospectus.

Notwithstanding the statements in the preceding paragraphs, no document, report or exhibit (or portion of any of the foregoing) or any other information that we have “furnished” to the SEC pursuant to the Exchange Act shall be incorporated by reference into this prospectus.

We will furnish without charge to you, on written or oral request, a copy of any or all of the documents incorporated by reference in this prospectus, including exhibits to these documents. You should direct any requests for documents to:

bioAffinity Technologies, Inc.
3300 Nacogdoches Road, Suite 216
San Antonio, Texas 78217
(210) 698-5334
Attn: Chief Financial Officer

You also may access these filings on our website at www.bioaffinitytech.com under the heading “Investor Relations—SEC Filings.” We do not incorporate the information on our website into this prospectus or any supplement to this prospectus, and you should not consider any information on, or that can be accessed through, our website as part of this prospectus or any supplement to this prospectus (other than those filings with the SEC that we specifically incorporate by reference into this prospectus or any supplement to this prospectus).

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



bioAffinity Technologies, Inc.

32,495,628 Shares of Common Stock

PROSPECTUS

September 16, 2025
