

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

FORM S-1
REGISTRATION STATEMENT
UNDER
THE SECURITIES ACT OF 1933

BONE BIOLOGICS CORPORATION

(Exact name of registrant as specified in its charter)

Delaware	2834	42-1743430
(State or other jurisdiction of incorporation or organization)	(Primary Standard Industrial Classification Code Number)	(I.R.S. Employer Identification Number)

2 Burlington Woods Drive, Suite 100
Burlington, MA 01803
(781) 552-4452

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

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

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

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

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

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

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

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

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

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

The registrant hereby amends this registration statement on such date or dates as may be necessary to delay its effective date until the registrant shall file a further amendment which specifically states that this registration statement shall thereafter

become effective in accordance with Section 8(a) of the Securities Act of 1933 or until the registration statement shall become effective on such date as the Securities and Exchange Commission, acting pursuant to said Section 8(a), may determine.

The information in this preliminary prospectus is not complete and may be changed. These securities may not be sold until the registration statement filed with the Securities and Exchange Commission is effective. This preliminary prospectus is not an offer to sell nor does it seek an offer to buy these securities in any jurisdiction where the offer or sale is not permitted.

Subject to Completion, dated January 30, 2024

PRELIMINARY PROSPECTUS



BONE BIOLOGICS CORPORATION

Up to Shares of Common Stock

Up to Prefunded Warrants to purchase up to Shares of Common Stock

Up to Shares of Common Stock underlying the Prefunded Warrants

Up to Common Warrants to purchase up to Shares of Common Stock

Up to Shares of Common Stock underlying the Common Warrants

Up to Placement Agent Warrants to Purchase up to Shares of Common Stock

Up to Shares of Common Stock Underlying the Placement Agent Warrants

We are offering up to shares of common stock, par value \$0.001 per share (“common stock”), together with warrants to purchase up to shares of common stock, which we refer to as the “warrants,” at an assumed combined public offering price of \$ per share and accompanying warrant (the last reported sale price of our common stock on the Nasdaq Capital Market, or Nasdaq, on , 2024). Each share of our common stock is being sold together with one warrant to purchase one share of common stock. The warrants will have an assumed exercise price of \$ per share (100% of the combined public offering price per share of common stock and accompanying warrant) and will be exercisable upon issuance and will expire five years from the date of issuance. This prospectus also relates to the offering of the shares of common stock issuable upon exercise of warrants.

We are also offering to those investors, if any, whose purchase of shares of our common stock in this offering would result in such investor, together with its affiliates and certain related parties, beneficially owning more than 4.99% (or, at the election of the investor, 9.99%) of our outstanding common stock following the consummation of this offering, the opportunity to purchase, in lieu of the common stock that would otherwise result in the investor’s beneficial ownership exceeding 4.99% (or, at the election of the investor, 9.99%), pre-funded warrants each to purchase one share of our common stock at an exercise price of \$0.001, which we refer to as the “pre-funded warrants.” Each pre-funded warrant will be exercisable upon issuance and may be exercised at any time until all of the pre-funded warrants are exercised in full. Each pre-funded warrant is being sold together with one warrant to purchase one share of common stock. The public offering price for each pre-funded warrant and the accompanying warrant is equal to the price per share of common stock and the accompanying warrant being sold to the public in this offering, minus \$0.001. This prospectus also relates to the offering of the shares of common stock issuable upon exercise of the pre-funded warrants.

For each pre-funded warrant we sell, the number of shares of common stock we sell in this offering will be decreased on a one-for-one basis. The shares of common stock and/or pre-funded warrants and the accompanying warrant can only be purchased together in this offering but will be issued separately and will be immediately separable upon issuance.

This offering will terminate on , 2024 unless we decide to terminate the offering (which we may do at any time in our discretion) prior to that date. We will have one closing for all the securities purchased in this offering. The combined public offering price per share (or pre-funded warrant) and accompanying warrant will be fixed for the duration of this offering.

We have engaged _____, or the placement agent, to act as our exclusive placement agent in connection with this offering. The placement agent has agreed to use its reasonable best efforts to arrange for the sale of the securities offered by this prospectus. The placement agent is not purchasing or selling any of the securities we are offering and the placement agent is not required to arrange the purchase or sale of any specific number or dollar amount of securities. We have agreed to pay to the placement agent the placement agent fees set forth in the table below, which assumes that we sell all of the securities offered by this prospectus. Since we will deliver the securities to be issued in this offering upon our receipt of investor funds, there is no arrangement for funds to be received in escrow, trust or similar arrangement. There is no minimum offering requirement as a condition of closing of this offering. Because there is no minimum offering amount required as a condition to closing this offering, we may sell fewer than all of the securities offered hereby, which may significantly reduce the amount of proceeds received by us, and investors in this offering will not receive a refund in the event that we do not sell an amount of securities sufficient to pursue our business goals described in this prospectus. In addition, because there is no escrow account and no minimum offering amount, investors could be in a position where they have invested in our company, but we are unable to fulfill all of our contemplated objectives due to a lack of interest in this offering. Further, any proceeds from the sale of securities offered by us will be available for our immediate use, despite uncertainty about whether we would be able to use such funds to effectively implement our business plan. See the section entitled “Risk Factors” for more information. We will bear all costs associated with the offering. See “Plan of Distribution” on page 65 of this prospectus for more information regarding these arrangements.

Our common stock is listed on Nasdaq under the symbol “BBLG.” There is no established trading market for the pre-funded warrants or the warrants and we do not expect an active market to develop. In addition, we do not intend to list the pre-funded warrants or the warrants on any national securities exchange or other trading market. Without an active trading market, the liquidity of these securities will be limited.

On December 20, 2023, we effected a reverse stock split of our common stock at a ratio of 1-for-8. Unless otherwise noted, the share and per share information in this prospectus reflects the effect of the reverse stock split.

Certain information in this prospectus is based on an assumed public offering price of \$ _____ per share and accompanying warrant (the last reported sale price of our common stock on Nasdaq on _____, 2024). The actual public offering price will be determined between us and the placement agent based on market conditions at the time of pricing, and may be at a discount to the current market price of our common stock. Therefore, the recent market price per share of common stock used throughout this prospectus as an assumed combined public offering price may not be indicative of the final offering price.

	Per Share and Accompanying Warrant	Per Pre- Funded Warrant and Accompanying Warrant	Total
Public offering price	\$ _____	\$ _____	\$ _____
Placement Agent fees ⁽¹⁾	\$ _____	\$ _____	\$ _____
Proceeds to us (before expenses) ⁽²⁾	\$ _____	\$ _____	\$ _____

- (1) We have agreed to pay the placement agent a cash fee equal to 7.0%. We have also agreed to pay the placement agent a management fee of 1.0% of the aggregate gross proceeds raised in this offering and to reimburse the placement agent for certain of its offering related expenses, including reimbursement for non-accountable expenses in an amount up to \$35,000, legal fees and expenses in the amount of up to \$100,000, and for its clearing expenses in the amount of \$15,950. In addition, we have agreed to issue the placement agent or its designees warrants to purchase a number of shares of common stock equal to 6.0% of the shares of common stock sold in this offering (including the shares of common stock issuable upon the exercise of the pre-funded warrants), at an assumed exercise price of \$ _____ per share, which represents 125% of the public offering price per share and accompanying warrant. For a description of compensation to be received by the placement agent, see “Plan of Distribution” for more information.
- (2) Because there is no minimum number of securities or amount of proceeds required as a condition to closing in this offering, the actual public offering amount, placement agent fees, and proceeds to us, if any, are not presently determinable and may be substantially less than the total maximum offering amounts set forth above. For more information, see “Plan of Distribution.”

You should read this prospectus, together with additional information described under the heading “Where You Can Find More Information,” carefully before you invest in any of our securities.

Investing in our securities involves a high degree of risk. See the section entitled “Risk Factors” beginning on page 9 of this prospectus for a discussion of risks that should be considered in connection with an investment in our securities.

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

Delivery of the securities offered hereby is expected to be made on or about _____, 2024, subject to satisfaction of customary closing conditions.

The date of this prospectus is _____.

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ABOUT THIS PROSPECTUS

We have not, and the placement agent has not, authorized anyone to provide you with additional information or information different from that contained in this prospectus filed with the Securities and Exchange Commission (the “SEC”). We do not, and the placement agent and its affiliates do not, take any responsibility for, and can provide no assurance as to the reliability of, any other information that others may give you. We are offering to sell, and seeking offers to buy, our securities only in jurisdictions where offers and sales are permitted. The information contained in this prospectus is accurate only as of its date, regardless of the time of delivery of this prospectus or any sale of our securities. Our business, financial condition, results of operations and prospects may have changed since that date.

This prospectus contains estimates and other statistical data made by independent parties and by us relating to market size and growth and other data about our industry. We obtained the industry and market data in this prospectus from our own research as well as from industry and general publications, surveys and studies conducted by third parties. This data involves a number of assumptions and limitations and contains projections and estimates of the future performance of the industries in which we operate that are subject to a high degree of uncertainty, including those discussed in “Risk Factors.” We caution you not to give undue weight to such projections, assumptions and estimates. Further, industry and general publications, studies and surveys generally state that they have been obtained from sources believed to be reliable, although they do not guarantee the accuracy or completeness of such information. While we believe that these publications, studies and surveys are reliable, we have not independently verified the data contained in them. In addition, while we believe that the results and estimates from our internal research are reliable, such results and estimates have not been verified by any independent source.

Neither we nor the placement agent have done anything that would permit this offering or the possession or distribution of this prospectus in any jurisdiction where action for those purposes is required, other than in the United States. Persons outside the United States who come into possession of this prospectus must inform themselves about, and observe any restrictions relating to, the offering of the securities and the distribution of this prospectus outside of the United States.

CAUTIONARY NOTE CONCERNING FORWARD-LOOKING STATEMENTS

This prospectus contains forward-looking statements that involve risks and uncertainties. You should not place undue reliance on these forward-looking statements. All statements other than statements of historical fact contained in this prospectus are forward-looking statements and are only predictions. We have based these forward-looking statements largely on our current expectations and projections about future events and financial trends that we believe may affect our business, financial condition and results of operations. In some cases, you can identify these forward-looking statements by terms such as “anticipate,” “believe,” “continue,” “could,” “depend,” “estimate,” “expect,” “intend,” “may,” “ongoing,” “plan,” “potential,” “predict,” “project,” “should,” “will,” “would” or the negative of those terms or other similar expressions, although not all forward-looking statements contain those words. We have based these forward-looking statements on our current expectations and projections about future events and trends that we believe may affect our financial condition, results of operations, strategy, short- and long-term business operations and objectives, and financial needs. These forward-looking statements include, but are not limited to, statements concerning the following:

- our ability to maintain compliance with the Nasdaq listing standards and remain listed on Nasdaq;
- our projected financial position and estimated cash burn rate;
- our estimates regarding expenses, future revenues and capital requirements;
- our ability to continue as a going concern;
- our need to raise substantial additional capital to fund our operations;
- the success, cost and timing of our clinical trials;
- 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 product candidates;
- the ultimate impact of health pandemics or epidemics on our business, our clinical trials, our research programs, healthcare systems or the global economy as a whole;
- the potential that results of preclinical and clinical trials indicate our current product candidate or any future 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 current product candidates;
- our ability to protect our intellectual property rights and the potential for us to incur substantial costs from lawsuits to enforce or protect our intellectual property rights;
- the possibility that a third party may claim we or our third-party licensors have infringed, misappropriated or otherwise violated their intellectual property rights and that we may incur substantial costs and be required to devote substantial time defending against claims against us;
- our reliance on third-party suppliers and manufacturers;
- the success of competing therapies and products that are or become available;
- our ability to expand our organization to accommodate potential growth and our ability to retain and attract key personnel;
- the potential for us to incur substantial costs resulting from product liability lawsuits against us and the potential for these product liability lawsuits to cause us to limit our commercialization of our product candidate;
- market acceptance of our product candidate, the size and growth of the potential markets for our current product candidate and any future 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;
- our expectation regarding the number of shares outstanding after this offering;
- our intention to use the net proceeds of this offering to fund clinical trials, maintain and extend our patent portfolio, and for working capital and other general corporate purposes; and
- pending the intended uses described herein, our intention to invest the net proceeds of this offering in short-term, investment grade, interest-bearing securities.

These forward-looking statements are subject to a number of risks, uncertainties and assumptions, including the successful development and commercialization of our product candidates, market acceptance of our product candidates, our financial performance, including our ability to fund operations, our ability to maintain compliance with Nasdaq’s continued listing requirements, regulatory approval and regulation of our product candidates, our expected use of proceeds from this offering, and other factors and risks identified from time to time in our filings with the SEC, including this prospectus and those described in “Risk Factors.” Moreover, we operate in a very competitive and rapidly changing environment. New risks emerge from time to time. It is not possible for our management to predict all risks, nor can we assess the impact of all factors on our business or the extent to which any factor, or combination of factors, may cause actual results to differ materially from those contained in any forward-looking statements we may make. In light of these risks, uncertainties and assumptions, the forward-looking events and circumstances discussed in this prospectus may not occur and actual results could differ materially and adversely from those anticipated or implied in the forward-looking statements.

You should not rely upon forward-looking statements as predictions of future events. Although we believe that the expectations reflected in the forward-looking statements are reasonable, we cannot guarantee that the future results, levels of activity, performance or events and circumstances reflected in the forward-looking statements will be achieved or occur. Moreover, except as required by law, neither we nor any other person assumes responsibility for the accuracy and completeness of the forward-looking statements. We undertake no obligation to update publicly any forward-looking statements for any reason after the date of this prospectus to conform these statements to actual results or to changes in our expectations.

You should read this prospectus and the documents that we reference in this prospectus and have filed with the SEC as exhibits to the registration statement of which this prospectus is a part with the understanding that our actual future results, levels of activity, performance and events and circumstances may be materially different from what we expect.

Risk Factors Summary

The following factors are among the principal factors that make in an investment in this offering speculative or risky. For a more detailed description of the risks material to our business, see “Risk Factors” beginning on page 9. The following summary should not be considered an exhaustive summary of the material risks we face and should be read in conjunction with the “Risk Factors” section and the other information in this prospectus. These factors include:

- Investors in this offering will experience immediate and substantial dilution in the book value of their investment, and will experience further dilution if we issue additional equity or equity-linked securities in the future.
- Our recurring operating losses have raised substantial doubt regarding our ability to continue as a going concern.
- There is not expected to be an active trading market for the warrants in this offering, and warrant holders have no rights as stockholders.
- Our management will have broad discretion over the use of the proceeds we receive in this offering.
- We may be unable to comply with the continued listing standards of Nasdaq.
- Our Chief Executive Officer and Chief Financial Officer have contractual rights to participate in future financings.
- We have a limited operating history.
- We will require substantial capital to complete studies of our product candidates and, if possible, achieve FDA approval for the products.
- Our product candidates are at an early stage of development and may not be successfully developed or commercialized.
- FDA regulation is costly and time consuming, which may delay or prevent us from commercializing our product candidates.
- Our product candidates may cause unacceptable adverse events.
- Suspensions or delays in commencing and completing clinical testing could increase our costs and delay or prevent us from commercializing our product candidates.
- We have limited resources to pursue product candidates and indications.
- We may have difficulty recruiting patients for our clinical trials.
- Any success in preclinical studies and early clinical trials does not predict the success of later trials; our product candidates may not have favorable results or receive regulatory approval.
- We may be unable to obtain regulatory approval in non-U.S. jurisdictions.
- We may be unable to retain or recruit necessary personnel to advance the development of our product candidates.
- We rely on third parties to supply raw materials for our product candidates and to conduct our preclinical and clinical trials.
- We must comply with our obligations under license agreements or risk losing rights that are important to our business.
- We rely on patents and other intellectual property to protect some of our product candidates.
- We could be subject to substantial costs in legal proceedings or other actions relating to intellectual property rights.
- We may not be able to obtain patent protection for our product candidates, or our intellectual property may not be sufficient to protect our product candidates from competition.
- Our commercial success depends upon attaining significant market acceptance of our lead product candidate and future product candidates, if approved, among physicians, patients, healthcare payors and treatment centers.
- Our product candidates, if approved, may not be covered or adequately reimbursed by third-party payors.
- Healthcare legislative measures aimed at reducing healthcare costs may negatively impact our business.
- Our future success depends on the performance and continued service of our officers and directors.
- We face substantial competition, which may result in others discovering, developing or commercializing products before or more successfully than we do.
- Product liability lawsuits against us could cause us to incur substantial liabilities and to limit commercialization of any products that we may develop.
- The price of our common stock may fluctuate substantially.
- We may be at risk of securities class action litigation.
- Market and economic conditions may negatively impact our business, financial condition and share price.
- We do not intend to pay cash dividends on our shares of common stock.
- Our governing documents and Delaware law have anti-takeover effects that could discourage, delay or prevent a change in control.

PROSPECTUS SUMMARY

The following summary highlights selected information contained in this prospectus and does not contain all of the information that may be important to you and your investment decision. Before investing in our securities, you should carefully read this entire prospectus, including our consolidated financial statements and the related notes, as well as the information under the caption “Risk Factors” herein. Some of the statements in this prospectus constitute forward-looking statements that involve risks and uncertainties. See “Cautionary Note Concerning Forward-Looking Statements.” In this prospectus, unless context requires otherwise, references to “we,” “us,” “our,” “BBLG” “Bone Biologics,” or the “Company” refer to Bone Biologics Corporation and its subsidiary on a consolidated basis.

Company Overview

We are a medical device company that is currently focused on bone regeneration in spinal fusion using the recombinant human protein known as NELL-1. NELL-1 in combination with DBM, demineralized bone matrix, is an osteopromotive recombinant protein that provides target specific control over bone regeneration. The NELL-1 technology platform has been licensed exclusively for worldwide applications to us through a technology transfer from the UCLA Technology Development Group on behalf of UC Regents (“UCLA TDG”). UCLA TDG and the Company received guidance from the Food and Drug Administration (“FDA”) that NELL-1/DBM will be classified as a device/drug combination product that will require an FDA-approved pre-market approval application (“PMA”) before it can be commercialized in the United States.

We were founded by University of California professors in collaboration with an Osaka University professor and a University of Southern California surgeon in 2004 as a privately-held company with proprietary, patented technology that has been validated in sheep and non-human primate models to facilitate bone growth. We believe our platform technology has application in delivering improved outcomes in the surgical specialties of spinal, orthopedic, general orthopedic, plastic reconstruction, neurosurgery, interventional radiology, and sports medicine. Lead product development and clinical studies are targeted on spinal fusion surgery, one of the larger segments in the orthopedic market.

We are a development stage entity. The production and marketing of our products and ongoing research and development activities are subject to extensive regulation by numerous governmental authorities in the United States. Prior to marketing in the United States, any combination product developed by us must undergo rigorous preclinical (animal) and clinical (human) testing and an extensive regulatory approval process implemented by the FDA under the Federal Food, Drug, and Cosmetic Act. There can be no assurance that we will not encounter problems in clinical trials that will cause us or the FDA to delay or suspend the clinical trials.

The platform technology is our recombinant human protein, known as NELL-1, a proprietary skeletal specific growth factor which is a bone void filler. NELL-1 provides regulation over skeletal tissue formation and stem cell differentiation during bone regeneration. We obtained the platform technology pursuant to an exclusive license agreement with UCLA TDG which grants us exclusive rights to develop and commercialize NELL-1 for spinal fusion by local administration, osteoporosis and trauma applications. A major challenge associated with orthopedic surgery is effective bone regeneration, including challenges related to rapid, uncontrolled bone growth which can cause unsound structure; cysts and less dense bone formation; unwanted bone formation, and swelling; and intense inflammatory response to current bone regeneration compounds. We believe NELL-1 will address these unmet clinical challenges for effective bone regeneration, especially in hard healers.

We are currently focused on bone regeneration in lumbar spinal fusion, in keeping with our exclusive license agreement, using NELL-1 in combination with DBM, a demineralized bone matrix from Musculoskeletal Transplant Foundation (“MTF”). The NELL-1/DBM medical device is a combination product which is an osteopromotive recombinant protein that provides target specific control over bone regeneration. Leveraging the resources of investors and strategic partners, we have successfully surpassed four critical milestones:

- Demonstrating a successful small laboratory scale pilot run for the manufacturing of the recombinant NELL-1 protein in Chinese hamster ovary cells;
- Validation of protein dosing and efficacy in established large animal sheep models pilot study;
- Completed pivotal animal study; and
- Initiated a first-in-human pilot clinical trial in Australia.

Our lead product candidate is expected to be purified NELL-1 mixed with 510(k) cleared DBM Demineralized Bone Putty recommended for use in conjunction with applicable hardware consistent with the indication. The NELL-1/DBM Fusion Device will be comprised of a single dose vial of NELL-1 recombinant protein freeze dried onto DBM. A vial of NELL-1/DBM will be sold in a convenience kit with a diluent and a syringe of 510(k) cleared demineralized bone (“DBM Putty”) produced by MTF. A delivery device will allow the surgeon to mix the reconstituted NELL-1 with the appropriate quantity of DBM Putty just prior to implantation.

The NELL-1/DBM Fusion Device is intended for use in lumbar spinal fusion and may have a variety of other spine and orthopedic applications. While the product is initially targeted at the lumbar spine fusion market, in keeping with our exclusive license agreement, we believe NELL-1’s novel set of characteristics, target specific mechanism of action, efficacy, safety and affordability position the product well for application in a variety of procedures including:

Spine Implants. Globally a \$3 billion market opportunity, this is the largest market for bone substitute product, representing greater than 70% of the total U.S. market according to Transparency Market Research. While use of the patient’s own bone, also referred to as autograft, to enhance fusion of vertebral segments remains the optimal use for this type of treatment, complications associated with use of autograft bone including pain, increased surgical time and infection limit its use.

Non-Union Trauma Cases. While the majority of fractures heal without the need for osteosynthetic products, bone substitutes are used in complicated breaks where the bone does not mend naturally. Globally an \$8 billion market opportunity, management believes that NELL-1 technology is expected to perform as well as other growth factors in this market.

Osteoporosis. Globally an \$11.2 billion market opportunity, the medical need to find a solution to counter a decrease in bone mass and density seen in women most frequently after menopause or a similar effect on astronauts in microgravity environments for an extended period is a major medical challenge. The systemic use of NELL-1 to stimulate bone regeneration throughout the body thereby increasing bone density could have a very significant impact on the treatment of osteoporosis.

We have completed two preclinical sheep studies that demonstrated our recombinant NELL-1 (“rhNELL-1”) growth factor effectively promotes bone formation in a phylogenetically advanced spine model. In addition, rhNELL-1 was shown to be well tolerated and there were no findings of inflammation. Our pivotal sheep study evaluated the effect of rhNELL-1 combined with DBM on lumbar interbody arthrodesis in an adult ovine model and demonstrated a 37.5% increased frequency of fusion at 26 weeks from the control.

Our first-in-man pilot clinical study commenced year-end 2023 and will evaluate the safety and effectiveness of NB1 in adult subjects with spinal degenerative disc disease at one level from L2-S1, who may also have up to Grade 1 spondylolisthesis or Grade 1 retrolisthesis at the involved level who undergo transforaminal lumbar interbody fusion. The multi-center, prospective, randomized trial consists of 30 patients in Australia, with the primary end-point being fusion success at 12 months and change from baseline in the Oswestry Disability Index pain score. We expect completion of the trial 12 months following enrollment of the 30th patient. We intend to use the pilot clinical trial data from Australia to enable a future larger U.S. pivotal clinical study, prior to submission of a PMA to the FDA.

Our Business Strategy

Our business plan is to develop our target-specific growth factor for bone regeneration, based on preclinical and clinical data that has demonstrated increases in the quantity and quality of bone, and a strong safety profile. Our initial focus on lumbar spinal fusion entails advancing our target-specific growth factor through clinical studies to achieve FDA approval with comparable efficacy and safety to the gold standard for spine fusion (autografts). Continued capital funding is critical to facilitate the development of our Nell-1 technology through the clinical regulatory path.

Intellectual Property Risks

Our patent portfolio currently consists of nine patents and we intend to expand our portfolio through composition of matter, methods of use and methods of production patent applications, as the opportunity arises through the development of our platform technology. Our success will depend in part on our ability to obtain patents and product license rights, maintain trade secrets, and operate without infringing on the proprietary rights of others, both in the United States and other countries. There can be no assurance that patents issued to or licensed by us will not be challenged, invalidated, rendered unenforceable, or circumvented, or that the rights granted thereunder will provide proprietary protection or competitive advantages to us. The patent positions of medical device companies are uncertain and involve complex legal and factual questions. We may incur significant expenses in protecting our intellectual property and defending or assessing claims with respect to intellectual property owned by others. See “Risk Factors” on page 9 for a discussion of intellectual property risks to consider carefully before deciding to invest in our securities.

Recent Developments

Amendment to the Company’s Amended and Restated Bylaws

On October 20, 2023, the Board of Directors of the Company approved an amendment to the Company’s Amended and Restated Bylaws (the “Bylaws”). The amendment to the Bylaws, which became effective immediately, reduces the quorum requirement at all meetings of the Company’s stockholders from a majority in voting power of the common stock issued and outstanding and entitled to vote at the meeting to at least one-third in voting power of the common stock issued and outstanding and entitled to vote at the meeting.

November 2023 Offering

On November 20, 2023 the Company sold and issued, in a registered direct offering (the “Registered Direct Offering”), 142,384 shares of common stock, at an offering price of \$5.12 per share to certain institutional investors (the “Purchasers”) pursuant to a securities purchase agreement (the “Purchase Agreement”). Pursuant to the Purchase Agreement, in a concurrent private placement (together with the Registered Direct Offering, the “November Offering”), the Company issued to the Purchasers unregistered warrants (the “November Warrants”) to purchase up to an aggregate of 142,384 shares of common stock, which represent 100% of the shares of common stock issued and sold in the Registered Direct Offering. The November Warrants are exercisable at an exercise price of \$4.16 per share, were exercisable immediately upon issuance, and will expire five and one-half years from the date of issuance. In addition, the Company issued the placement agent as compensation in connection with the November Offering, warrants (the “November Placement Agent Warrants”) to purchase up to an aggregate of 8,543 shares of common stock (equal to 6.0% of the aggregate number of shares sold in the Registered Direct Offering). The November Placement Agent Warrants have substantially the same terms and conditions as the November Warrants, except that the November Placement Agent Warrants have a term of five years from the commencement of sales in the November Offering and an exercise price of \$6.40 per share.

Nasdaq Panel Decision

On September 27, 2023, the Company received a written notice from the Nasdaq notifying the Company that it was not in compliance with the \$1.00 per share minimum bid price requirement set forth in Nasdaq Listing Rule 5550(a)(2) and that Nasdaq’s staff had determined to delist the Company’s securities. On December 11, 2023, a Nasdaq Hearings Panel granted the Company’s request for continued listing on Nasdaq subject to the Company demonstrating compliance with the minimum bid price requirement prior to January 12, 2024. The Company received notice from Nasdaq on January 9, 2024 that it had regained compliance with the minimum bid price requirement. The Company will remain under a Nasdaq discretionary panel monitor until June 28, 2024.

Reverse Stock Split

On December 12, 2023, we received the approval of the requisite number of holders of the shares of our common stock to amend our certificate of incorporation to effect a reverse split of the shares of our common stock at a ratio of 1-for-5 to 1-for-20 (or any number in between), with the exact ratio to be set within such range in the discretion of our Board of Directors without further approval or authorization of our stockholders. On December 14, 2023, we filed a Certificate of Amendment to our Amended and Restated Certificate of Incorporation, as amended (“Certificate of Incorporation”), with the Secretary of State of the State of Delaware to effect a 1-for-8 reverse stock split of our outstanding common stock. The reverse stock split became effective on December 20, 2023. The conversion or exercise prices of our issued and outstanding stock options and warrants were adjusted accordingly in connection with the reverse stock split.

Litigation Update

On January 10, 2024 we entered into a Settlement Agreement and Mutual General Release (the “Agreement”) with Drs. Bessie (Chia) Soo and Kang (Eric) Ting, on the one hand (the “plaintiffs”), and the Company and Stephen LaNeve on the other hand (together with the Company, the “defendants”), in settlement of the claims for breach of contract and tortious interference with contract against the defendants filed in the United States District Court for the District of Massachusetts (the “Court”). The Agreement is effective as of January 9, 2024. We had certain indemnification obligations to Mr. LaNeve arising out of actions taken in connection with his service to the Company. Under the Agreement, we will pay the plaintiffs \$750,000 in cash within 20 business days after the date the Agreement was executed. Our insurance carrier’s portion of the claim is \$400,000 less certain retention amounts. The parties to the Agreement have filed a joint stipulation to dismiss the action with prejudice with the Court and we expect the action to be dismissed by the Court.

Director Appointment

On January 8, 2024, the Board of Directors appointed Robert E. Gagnon to the Board of Directors. Erick Lucera resigned from the Board of Directors on December 27, 2023, effective as of the date Mr. Gagnon was appointed.

Going Concern

We have a history of operating losses since inception and expect to incur additional near-term losses. As discussed further in “Management’s Discussion and Analysis - Liquidity and Capital Resources”, our independent registered public accounting firm, in its audit report to the financial statements included in our Annual Report on Form 10-K for the year ended December 31, 2022, expressed substantial doubt about our ability to continue as a going concern. Our consolidated financial statements do not include any adjustments that may result from the outcome of this uncertainty. Following this offering, we will need to raise additional capital to fund our operations and continue to support our planned development and commercialization activities. If we cannot secure the financing needed to continue as a viable business, our stockholders may lose some or all of their investment in us.

Corporate Information

We were incorporated under the laws of the State of Delaware on October 18, 2007 as AFH Acquisition X, Inc. Pursuant to a Merger Agreement, dated September 19, 2014, by and among the Company, its wholly-owned subsidiary, Bone Biologics Acquisition Corp., a Delaware corporation (“Merger Sub”), and Bone Biologics, Inc., Merger Sub merged with and into Bone Biologics Inc., with Bone Biologics Inc. remaining as the surviving corporation in the merger. Upon the consummation of the merger, the separate existence of Merger Sub ceased. On September 22, 2014, the Company officially changed its name to “Bone Biologics Corporation” to more accurately reflect the nature of its business and Bone Biologics, Inc. became a wholly owned subsidiary of the Company. Bone Biologics, Inc. was incorporated in California on September 9, 2004.

Our principal executive offices are located at 2 Burlington Woods Drive, Suite 100, Burlington MA 01803 and our telephone number is (781) 552-4452. Our website address is www.bonebiologics.com. The information contained on our website is not

incorporated by reference into this prospectus, and you should not consider any information contained on, or that can be accessed through, our website as part of this prospectus or in deciding whether to invest in our securities.

THE OFFERING

The following summary contains basic information about this offering. The summary is not intended to be complete. You should read the full text and more specific details contained elsewhere in this prospectus.

Common Stock Offered	Up to shares.
Pre-Funded Warrants Offered	We are also offering to those investors, if any, whose purchase of shares of our common stock in this offering would result in such investor, together with its affiliates and certain related parties, beneficially owning more than 4.99% (or, at the election of the investor, 9.99%) of our outstanding common stock following the consummation of this offering, the opportunity to purchase, in lieu of the common stock that would otherwise result in the investor’s beneficial ownership exceeding 4.99% (or, at the election of the investor, 9.99%), pre-funded warrants each to purchase one share of our common stock at an exercise price of \$0.001, which we refer to as the “pre-funded warrants.” Each pre-funded warrant will be exercisable upon issuance and may be exercised at any time until all of the pre-funded warrants are exercised in full. Each pre-funded warrant is being sold together with one warrant to purchase one share of common stock. The public offering price for each pre-funded warrant and the accompanying warrant is equal to the price per share of common stock and the accompanying warrant being sold to the public in this offering, minus \$0.001. For each pre-funded warrant we sell, the number of shares of common stock we sell will be decreased on a one-for-one basis. This prospectus also relates to the offering of the shares of common stock issuable upon exercise of the pre-funded warrants. See “Description of Securities – Pre-Funded Warrants” for additional information.
Warrants Offered	Each share of common stock or pre-funded warrant is being offered together with one warrant to purchase one share of common stock. The warrants will have an assumed exercise price of \$ per share (100% of the combined public offering price per share of common stock and accompanying warrant) and will be exercisable upon issuance (the “Initial Exercise Date”). The warrants will expire on the five-year anniversary of the Initial Exercise Date. Each holder of warrants will be prohibited from exercising its warrant for shares of our common stock if, as a result of such exercise, the holder, together with its affiliates, would own more than 4.99% of the total number of shares of our common stock then issued and outstanding. However, any holder may increase such percentage to any other percentage not in excess of 9.99%. This offering also relates to the offering of the shares of common stock issuable upon the exercise of the warrants. For more information regarding the warrants, you should carefully read the section titled “Description of Securities — Warrants” in this prospectus.
Placement Agent Warrants	We have agreed to issue to the placement agent or its designees warrants, or the placement agent warrants, to purchase up to 6.0% of the shares of common stock sold in this offering (including the shares of common stock issuable upon the exercise of the pre-funded warrants), at an assumed exercise price of \$ per share, which represents 125% of the public offering price per share and accompanying warrant. For a description of the compensation to be received by the placement agent, see “Plan of Distribution” for more information.
Common Stock Outstanding Prior to This Offering	534,238 shares.
Common Stock to be Outstanding After this Offering	shares (assuming we sell only shares of common stock and no pre-funded warrants and no exercise of the warrants offered hereby).
Use of Proceeds	We estimate that the net proceeds of this offering assuming no exercise of the warrants, after deducting placement agent fees and estimated offering expenses, will be approximately \$4,265,462.40, assuming we sell only shares of common stock and no pre-funded warrants and assuming no exercise of the warrants. We intend to use all of the net proceeds we receive from this offering to fund clinical trials, maintain and extend our patent portfolio, and for working capital and other general corporate purposes. See “Use of Proceeds.”
Lock-up Agreements	Our executive officers and directors have agreed with the placement agent not to sell, transfer or dispose of any shares or similar securities for a period of days after the date of this prospectus. For additional information regarding our arrangement with the placement agent, please see “Plan of Distribution.”

<i>Reverse Split</i>	On December 20, 2023, we effected a 1-for-8 reverse stock split of our outstanding common stock. Unless otherwise noted, the share and per share information in this prospectus reflects the effect of the reverse stock split.
<i>Nasdaq Trading Symbol</i>	Our common stock is listed on the Nasdaq Capital Market under the symbol “BBLG.” We do not intend to list the pre-funded warrants or warrants offered hereunder on any stock exchange. Without an active trading market, the liquidity of the pre-funded warrants and warrants will be limited.
<i>Risk Factors</i>	See “Risk Factors” on page 9 and other information included in this prospectus for a discussion of factors to consider carefully before deciding to invest in our securities.

The discussion above is based on 534,238 shares of our common stock outstanding as of January 23, 2024, and excludes as of such date the following:

- 74,151 shares of common stock issuable upon exercise of stock options outstanding at a weighted average exercise price of \$107.65 per share.
- 197,844 shares of common stock issuable upon exercise of outstanding common stock warrants with a weighted average exercise price of \$127.86 per share.
- 555,338 shares of common stock reserved for future grants pursuant to the Bone Biologics Corporation 2015 Equity Incentive Plan (the “2015 Equity Incentive Plan”).
- shares of our common stock issuable upon the exercise of warrants to be issued in this offering; and
- shares of common stock issuable upon the exercise of the placement agent warrants to be issued to the placement agent or its designees as compensation in connection with this offering and pursuant to this prospectus.

Unless expressly indicated or the context requires otherwise, all information in this prospectus assumes (i) we issue no pre-funded warrants and (ii) no exercise of the warrants offered hereby.

RISK FACTORS

Investing in our securities involves a high degree of risk. You should carefully consider the risks described below and elsewhere in this prospectus, which could materially and adversely affect our business, results of operations or financial condition. These risks and uncertainties are not the only risks and uncertainties we face. Additional risks and uncertainties not currently known to us, or that we currently view as immaterial, may also impair our business. If any of the risks or uncertainties described below or any additional risks and uncertainties actually occur, our business, financial condition, results of operations and cash flow could be materially and adversely affected. As a result, you could lose all or part of your investment.

Risks Related to This Offering and Ownership of our Securities

Investors in this offering will experience immediate and substantial dilution in the book value of their investment. You will experience further dilution if we issue additional equity or equity-linked securities in the future.

You will incur immediate and substantial dilution as a result of this offering. The public offering price per share of common stock and accompanying warrant and the public offering price per pre-funded warrant and accompanying warrant will be substantially higher than the pro forma, as adjusted net tangible book value per share of our common stock after giving effect to this offering. Therefore, if you purchase securities in this offering, you will pay a price per share of common stock you acquire that substantially exceeds our net tangible book value per share after this offering. Based on an assumed public offering price of \$ per share of common stock and accompanying warrant (the last reported sale price of our common stock on Nasdaq on , 2024) and our net tangible book value as of September 30, 2023, you will experience immediate dilution of \$ per share, representing the difference between our pro forma, as adjusted net tangible book value per share after giving effect to this offering and the assumed public offering price.

If we issue additional shares of common stock, or securities convertible into or exchangeable or exercisable for shares of common stock, our stockholders, including investors who purchase shares of common stock, or pre-funded warrants in this offering, will experience additional dilution, and any such issuances may result in downward pressure on the price of our common stock. We also cannot assure you that we will be able to sell shares or other securities in any other offering at a price per share that is equal to or greater than the price per share paid by investors in this offering, and investors purchasing shares or other securities in the future could have rights superior to existing stockholders.

Our recurring operating losses have raised substantial doubt regarding our ability to continue as a going concern.

Our recurring operating losses raise substantial doubt about our ability to continue as a going concern. During the year ended December 31, 2022, we incurred a net loss of \$1.5 million, and used net cash in operating activities of \$3.6 million, and during the nine months ended September 30, 2023, we incurred a net loss of \$7.4 million and used net cash in operating activities of \$7.5 million. Our available cash is expected to fund our operations through the second quarter of 2024. These factors raise substantial doubt about the Company's ability to continue as a going concern within a reasonable period of time, which is considered to be one year from the issuance date of these financial statements. In addition, our independent registered public accounting firm, in its audit report to the financial statements included in our Annual Report on Form 10-K for the year ended December 31, 2022, expressed substantial doubt about our ability to continue as a going concern. Our financial statements do not include any adjustments that might result if we are unable to continue as a going concern and, therefore, be required to realize our assets and discharge our liabilities other than in the normal course of business which could cause investors to suffer the loss of all or a substantial portion of their investment. In order to have sufficient cash and cash equivalents to fund our operations in the future, we will need to raise additional equity or debt capital and cannot provide any assurance that we will be successful in doing so. The perception of our ability to continue as a going concern may make it more difficult for us to obtain financing for the continuation of our operations and could result in the loss of confidence by investors, suppliers and employees.

Future sales and issuances of our common stock could result in additional dilution of the percentage ownership of our stockholders and could cause our share price to fall.

Following this offering we expect that significant additional capital will be needed in the future to continue our planned operations, including increased marketing, hiring new personnel, commercializing our product, and continuing activities as an operating public company. To the extent we raise additional capital by issuing equity securities, our stockholders may experience substantial dilution. We may sell common stock, convertible securities or other equity securities in one or more transactions at prices and in a manner we determine from time to time. If we sell common stock, convertible securities or other equity securities in more than one transaction, investors may be materially diluted by subsequent sales. Such sales may also result in material dilution to our existing stockholders, and new investors could gain rights superior to our existing stockholders. Moreover, the perceived risk of this potential dilution could cause stockholders to attempt to sell their shares and investors to short our common stock. These sales also may make it more difficult for us to sell equity or equity-related securities in the future at a time and price that we deem reasonable or appropriate, and may cause you to lose the value of your investment.

The warrants are speculative in nature.

The warrants do not confer any rights of common stock ownership on their holders, such as voting rights or the right to receive dividends, but rather merely represent the right to acquire shares of common stock at a fixed price for a limited time. Moreover, following this offering the market value of the warrants, if any, will be uncertain and there can be no assurance that the market value of the warrants will equal or exceed their imputed offering price. The warrants will not be listed or quoted for trading on any market or exchange. There can be no assurance that the market price of our common stock will ever equal or exceed the exercise price of the warrants, and consequently, the warrants may expire valueless.

There is no public market for the pre-funded warrants or warrants offered by us.

There is no established public trading market for the pre-funded warrants or warrants and we do not expect such a market to develop. In addition, we do not intend to apply to list the pre-funded warrants or warrants on any national securities exchange or other nationally recognized trading system. Without an active trading market, the liquidity of the pre-funded warrants and warrants will be limited.

Holders of the warrants and pre-funded warrants will have no rights as common stockholders until they acquire our common stock.

Until holders of the warrants or pre-funded warrants acquire shares of our common stock upon exercise of the warrants or pre-funded warrants, the holders will have no rights with respect to shares of our common stock issuable upon exercise of the warrants or pre-funded warrants. Upon exercise of the warrants or pre-funded warrants, the holder will be entitled to exercise the rights of a common stockholder as to the security exercised only as to matters for which the record date occurs after the exercise.

Our management will have broad discretion over the use of the proceeds we receive in this offering and might not apply the proceeds in ways that increase the value of your investment.

Our management will have broad discretion in the application of the net proceeds from this public offering, including for any of the currently intended purposes described in the section entitled “Use of Proceeds.” Because of the number and variability of factors that will determine our use of the net proceeds from this offering, their ultimate use may vary substantially from their currently intended use. Our management may not apply our cash from this offering in ways that ultimately increase the value of any investment in our securities or enhance stockholder value. The failure by our management to apply these funds effectively could harm our business. Pending their use, we may invest the net proceeds from this offering in short-term, investment-grade, interest-bearing securities. These investments may not yield a favorable return to our stockholders. If we do not invest or apply our cash in ways that enhance stockholder value, we may fail to achieve expected financial results, which may result in a decline in the price of our shares of common stock, and, therefore, may negatively impact our ability to raise capital, invest in or expand our business, acquire additional products or licenses, commercialize our product, or continue our operations.

Purchasers who purchase our securities in this offering pursuant to a securities purchase agreement may have rights not available to purchasers that purchase without the benefit of a securities purchase agreement.

In addition to rights and remedies available to all purchasers in this offering under federal securities and state law, the purchasers that enter into a securities purchase agreement will also be able to bring claims of breach of contract against us. The ability to pursue a claim for breach of contract provides those investors with the means to enforce the covenants uniquely available to them under the securities purchase agreement including: (i) timely delivery of shares; (ii) agreement to not enter into variable rate financings for from closing, subject to certain exceptions; (iii) agreement to not enter into any financings for days from closing; and (iv) indemnification for breach of contract.

This is a best efforts offering, with no minimum amount of securities is required to be sold, and we may not raise the amount of capital we believe is required for our business plans, including our near-term business plans.

The placement agent has agreed to use its reasonable best efforts to solicit offers to purchase the securities in this offering. The placement agent has no obligation to buy any of the securities from us or to arrange for the purchase or sale of any specific number or dollar amount of the securities. There is no required minimum number of securities that must be sold as a condition to completion of this offering. Because there is no minimum offering amount required as a condition to the closing of this offering, the actual offering amount, placement agent fees and proceeds to us are not presently determinable and may be substantially less than the maximum amounts set forth above. We may sell fewer than all of the securities offered hereby, which may significantly reduce the amount of proceeds received by us, and investors in this offering will not receive a refund in the event that we do not sell an amount of securities sufficient to support our continued operations, including our near-term continued operations. Thus, we may not raise the amount of capital we believe is required for our operations in the short-term and may need to raise additional funds, which may not be available or available on terms acceptable to us.

Because there is no minimum required for the offering to close, investors in this offering will not receive a refund in the event that we do not sell an amount of securities sufficient to pursue the business goals outlined in this prospectus.

We have not specified a minimum offering amount nor have or will we establish an escrow account in connection with this offering. Because there is no escrow account and no minimum offering amount, investors could be in a position where they have invested in our company, but we are unable to fulfill our objectives due to a lack of interest in this offering. Further, because there is no escrow account in operation and no minimum investment amount, any proceeds from the sale of securities offered by us will be available for our immediate use, despite uncertainty about whether we would be able to use such funds to effectively implement our business plan. Investor funds will not be returned under any circumstances whether during or after the offering.

There can be no assurance that we will be able to comply with the continued listing standards of Nasdaq, a failure of which could result in a delisting of our common stock and certain warrants.

Nasdaq requires that the trading price of listed stock remain above \$1.00 in order for the stock to remain listed. If a listed stock trades below \$1.00 for more than 30 consecutive trading days, then it is subject to delisting from the Nasdaq. In addition, to maintain a listing on Nasdaq, we must satisfy minimum financial and other continued listing standards, including those regarding minimum stockholders' equity, minimum publicly available shares, director independence and independent committee requirements and other corporate governance requirements. We recently regained compliance with Nasdaq's listing standards, and Nasdaq will continue to monitor our compliance with its requirements including through a Nasdaq discretionary panel monitor until June 28, 2024. If we are unable to satisfy these standards, we could be subject to delisting, which would have a negative effect on the price of our common stock, impair your ability to sell or purchase our common stock or warrants when you wish to do so, and potentially cause you to lose the value of your investment in us. In the event of a delisting, we would expect to take actions to restore our compliance with the listing standards, but we can provide no assurance that any action we take to restore our compliance would allow our common stock to become listed again, stabilize the market price or improve the liquidity of our common stock, prevent our common stock from dropping below the minimum bid price requirement, or prevent future noncompliance with the listing requirements.

If the Company is delisted from Nasdaq, its common stock may be eligible for trading on an over-the-counter market. If the Company is not able to obtain a listing on another stock exchange or quotation service for its common stock, it may be extremely difficult or impossible for stockholders to sell their shares of common stock. Moreover, if the Company is delisted from Nasdaq, but obtains a substitute listing for its 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 the Company's common stock is delisted from Nasdaq, the value and liquidity of the Company's common stock would likely be significantly adversely affected. A delisting of the Company's common stock from Nasdaq could also adversely affect the Company's ability to obtain financing for its operations and/or result in a loss of confidence by investors, employees and/or business partners.

The right of our President and Chief Executive Officer and Chief Financial Officer to participate in future financings of ours could impair our ability to raise capital.

Jeffrey Frelick, our President and Chief Executive Officer, and Deina Walsh, our Chief Financial Officer, hold contractual preemptive rights which allow them to participate, at their option, in all future financings up to an amount necessary to maintain their percentage interest in our common stock. The existence of such preemptive rights, or the exercise of such rights, may deter potential investors from providing us needed financing, or may deter investment banks from working with us. This may have a material adverse effect on our ability to raise capital which, in turn, could have a material adverse effect on our business prospects.

If our shares of common stock become subject to the penny stock rules, it would become more difficult to trade our shares.

The SEC has adopted rules that regulate broker-dealer practices in connection with transactions in penny stocks. Penny stocks are generally equity securities with a price of less than \$5.00, other than securities registered on certain national securities exchanges or authorized for quotation on certain automated quotation systems, provided that current price and volume information with respect to transactions in such securities is provided by the exchange or system. If we do not retain a listing on Nasdaq and if the price of our common stock is less than \$5.00, our common stock will be deemed a penny stock. The penny stock rules require a broker-dealer, before a transaction in a penny stock not otherwise exempt from those rules, to deliver a standardized risk disclosure document containing specified information. In addition, the penny stock rules require that before effecting any transaction in a penny stock not otherwise exempt from those rules, a broker-dealer must make a special written determination that the penny stock is a suitable investment for the purchaser and receive (i) the purchaser's written acknowledgment of the receipt of a risk disclosure statement; (ii) a written agreement to transactions involving penny stocks; and (iii) a signed and dated copy of a written suitability statement. These disclosure requirements may have the effect of reducing the trading activity in the secondary market for our common stock, and therefore stockholders may have difficulty selling their shares.

Risks Relating to Our Financial Position and Capital Needs

Our limited operating history makes it difficult to evaluate our current business and future prospects.

We have a limited operating history, and there is a risk that we will be unable to continue as a going concern. We have minimal assets and no significant financial resources. Our limited operating history makes it difficult to evaluate our current business model and future prospects. Accordingly, you should consider our prospects in light of the costs, uncertainties, delays and difficulties frequently encountered by companies in the early stages of development. Potential investors should carefully consider the risks and uncertainties that a company with a limited operating history will face. In particular, potential investors should consider that there is a significant risk that we will not be able to, among other things:

- implement or execute our current business plan, which may or may not be sound;
- maintain our anticipated management and advisory team;
- raise sufficient funds in the capital markets to effectuate our business plan; and
- utilize the funds that we do have and/or raise in the future to efficiently execute our business strategy.

If we cannot execute any one of the foregoing or similar matters relating to our business, the business may fail, in which case you would lose the entire amount of your investment in us.

Our long-term capital requirements are subject to numerous risks.

We anticipate that we will require approximately \$5 million to complete first-in-man studies, and an estimated additional \$24 million in scientific expenses to achieve FDA approval for a spine interbody fusion indication. These amounts are estimates based on data currently available to us, and are subject to many factors, including the risk factors discussed herein. We anticipate we will need to raise substantial additional funds for the pivotal clinical trial prior to marketing our first product. The above estimates and our long-term capital requirements will depend on many factors, including, among others:

- the number of potential formulations, products and technologies in development;
- continued progress and cost of our research and development programs;
- progress with pre-clinical studies and clinical trials;
- time and costs involved in obtaining regulatory (including FDA) clearance;
- costs involved in preparing, filing, prosecuting, maintaining and enforcing patent claims;
- costs of developing sales, marketing and distribution channels and our ability to sell our formulations or products;
- costs involved in establishing manufacturing capabilities for commercial quantities of our products;
- competing technological and market developments;
- market acceptance of our device formulations or products;
- costs for recruiting and retaining employees and consultants;
- costs for training physicians;
- legal, accounting and other professional costs; and
- the effect of the novel coronavirus will have on our product development, clinical trials, and availability, cost, and type of financing.

We may consume available resources more rapidly than currently anticipated, resulting in the need for additional funding. We may seek to raise any necessary additional funds through equity or debt financings, collaborative arrangements with corporate partners or other sources, which may be dilutive to existing stockholders or otherwise have a material effect on our current or future business prospects. If adequate funds are not available, we may be required to significantly reduce or refocus our development and commercialization efforts with regard to our delivery technologies and our proposed formulations and products.

We have incurred losses since inception and we expect our operating expenses to increase in the foreseeable future, which may make it more difficult for us to achieve and maintain profitability.

We have no significant operating history and since inception to September 30, 2023 have incurred accumulated losses of approximately \$79 million. We will continue to incur significant expenses for development activities for our lead product candidate NELL-1/DBM.

We will continue to attempt to raise additional capital through debt and/or equity financing to provide additional working capital and fund future operations. However, there is no assurance that such financing will be consummated or obtained in sufficient amounts necessary to meet our needs. If cash resources are insufficient to satisfy our on-going cash requirements, we will be required to scale back or discontinue our product development programs, or obtain funds if available (although there can be no certainties) through strategic alliances that may require us to relinquish rights to our technology, or substantially reduce or discontinue our operations entirely. No assurance can be given that any future financing will be available or, if available, that it will be on terms that are satisfactory to us. Even if we are able to obtain additional financing, it may contain undue restrictions on our operations, in the case of

debt financing, or cause substantial dilution for our stockholders, in the case of equity financing. As a result, we can provide no assurance as to whether or if we will ever be profitable. If we are not able to achieve and maintain profitability, the value of our company and our common stock could decline significantly.

We face a number of risks associated with the incurrence of substantial debt which could adversely affect our financial condition.

If we incur a substantial amount of debt, we may be required to use a significant portion of any cash flow to pay principal and interest on the debt, which will reduce the amount available to fund working capital, capital expenditures, and other general purposes. Any indebtedness may negatively impact our ability to operate our business and limit our ability to borrow additional funds by increasing our borrowing costs, and impact the terms, conditions, and restrictions contained in possible future debt agreements, including the addition of more restrictive covenants; impact our flexibility in planning for and reacting to changes in our business as covenants and restrictions contained in possible future debt arrangements may require that we meet certain financial tests and place restrictions on the incurrence of additional indebtedness and place us at a disadvantage compared to similar companies in our industry that have less debt.

Risks Related to the Development and Regulatory Approval of our Product Candidates

Our product candidates are at an early stage of development and may not be successfully developed or commercialized.

Our products are in the early stage of development and will require substantial further capital expenditures, development, testing, and regulatory clearances prior to commercialization. The development and regulatory approval process takes several years, and it is not likely that our products, technologies or processes, even if successfully developed and approved by the FDA, would be commercially available for five or more years. Of the large number of devices in development, only a small percentage successfully completes the FDA regulatory approval process and is commercialized. Accordingly, even if we are able to obtain the requisite financing to fund our development programs, we cannot assure you that our product candidates will be successfully developed or commercialized. Our failure to develop, manufacture or receive regulatory approval for or successfully commercialize any of our product candidates, could result in the failure of our business and a loss of all of your investment in our company.

Any product candidates advanced into clinical development are subject to extensive regulation, which can be costly and time consuming, cause unanticipated delays or prevent the receipt of the required approvals to commercialize such product candidates.

The clinical development, manufacturing, labeling, storage, record-keeping, advertising, promotion, import, export, marketing and distribution of our product candidates are subject to extensive regulation by the FDA in the U.S. and by comparable health authorities in foreign markets. In the U.S., we may not be permitted to market our product candidates until we receive approval of our PMA from the FDA. The process of obtaining PMA approval is expensive, often takes many years and can vary substantially based upon the type, complexity and novelty of the products involved. In addition to the significant clinical testing requirements, our ability to obtain marketing approval for these products depends on obtaining the final results of required non-clinical testing, including characterization of the manufactured components of our product candidates and validation of our manufacturing processes. The FDA may determine that our product manufacturing processes, testing procedures or facilities are insufficient to justify approval. Approval policies or regulations may change and the FDA has substantial discretion in the approval process, including the ability to delay, limit or deny approval of a product candidate for many reasons. Despite the time and expense invested in clinical development of product candidates, regulatory approval is never guaranteed.

The FDA or another regulatory agency can delay, limit or deny approval of a product candidate for many reasons, including, but not limited to:

- the FDA or comparable foreign regulatory authorities may disagree with the design or implementation of clinical trials;
- we may be unable to demonstrate to the satisfaction of the FDA that a product candidate is safe and effective for any indication;
- the FDA may not accept clinical data from trials which are conducted by individual investigators or in countries where the standard of care is potentially different from the U.S.;
- the results of clinical trials may not meet the level of statistical significance required by the FDA for approval;
- we may be unable to demonstrate that a product candidate's clinical and other benefits outweigh its safety risks;
- the FDA may disagree with our interpretation of data from preclinical studies or clinical trials;
- the FDA may fail to approve the manufacturing processes or facilities of third-party manufacturers with which we or our collaborators contract for clinical and commercial supplies; or
- the approval policies or regulations of the FDA may significantly change in a manner rendering our clinical data insufficient for approval.

With respect to foreign markets, approval procedures vary among countries and, in addition to the aforementioned risks, can involve additional product testing, administrative review periods and agreements with pricing authorities. Any delay in obtaining, or inability to obtain, applicable regulatory approvals could prevent us from commercializing our product candidates.

Any product candidate we advance into clinical trials may cause unacceptable adverse events or have other properties that may delay or prevent their regulatory approval or commercialization or limit their commercial potential.

Unacceptable adverse events caused by any of our product candidates that we advance into clinical trials could cause us or regulatory authorities to interrupt, delay or halt clinical trials and could result in the denial of regulatory approval by the FDA or other regulatory authorities for any or all targeted indications and markets. This, in turn, could prevent us from commercializing the affected product candidate and generating revenues from its sale.

We have not yet completed testing of any of our product candidates for the treatment of the indications for which we intend to seek product approval in humans, and we currently do not know the extent of adverse events, if any, that will be observed in patients who receive any of our product candidates. If any of our product candidates cause unacceptable adverse events in clinical trials, we may not be able to obtain regulatory approval or commercialize such product or, if such product candidate is approved for marketing, future adverse events could cause us to withdraw such product from the market.

Delays in the commencement of clinical trials could result in increased costs and delay our ability to pursue regulatory approval.

The commencement of clinical trials can be delayed for a variety of reasons, including delays in:

- obtaining regulatory clearance to commence a clinical trial;
- identifying, recruiting and training suitable clinical investigators;
- reaching agreement on acceptable terms with prospective clinical research organizations, and trial sites, the terms of which can be subject to extensive negotiation, may be subject to modification from time to time and may vary significantly among different clinical research organizations and trial sites;
- obtaining sufficient quantities of a product candidate for use in clinical trials;
- obtaining an institutional review board (“IRB”) or ethics committee approval to conduct a clinical trial at a prospective site;
- identifying, recruiting and enrolling patients to participate in a clinical trial;
- retaining patients who have initiated a clinical trial but may withdraw due to adverse events from the therapy, insufficient efficacy, fatigue with the clinical trial process or personal issues; and
- issues of relationship between clinical trials in non-U.S. countries, such as our first-in-man pilot clinical trial being conducted in Australia, and FDA approval.

Any delays in the commencement of clinical trials will delay our ability to pursue regulatory approval for our product candidates. In addition, many of the factors that cause, or lead to, a delay in the commencement of clinical trials may also ultimately lead to the denial of regulatory approval of a product candidate.

Suspensions or delays in the completion of clinical testing could result in increased costs to us and delay or prevent our ability to complete development of that product or generate product revenues.

Once a clinical trial has begun, patient recruitment and enrollment may be slower than we anticipate. Clinical trials may also be delayed as a result of ambiguous or negative interim results or difficulties in obtaining sufficient quantities of product manufactured in accordance with regulatory requirements. Further, a clinical trial may be modified, suspended or terminated by us, an IRB, an ethics committee or a data safety monitoring committee overseeing the clinical trial, any clinical trial site with respect to that site, or the FDA or other regulatory authorities due to a number of factors, including:

- failure to conduct the clinical trial in accordance with regulatory requirements or our clinical protocols;
- inspection of the clinical trial operations or clinical trial site by the FDA or other regulatory authorities resulting in the imposition of a clinical hold;
- stopping rules contained in the protocol;
- unforeseen safety issues or any determination that the clinical trial presents unacceptable health risks; and/or
- lack of adequate funding to continue the clinical trial.

Any changes in the current regulatory requirements and guidance also may occur, and we may need to amend clinical trial protocols to reflect these changes. Amendments may require us to resubmit clinical trial protocols to IRBs for re-examination, which may impact the costs, timing and the likelihood of a successful completion of a clinical trial. If we experience delays in the completion of, or if we must suspend or terminate, any clinical trial of any product candidate, our ability to obtain regulatory approval for that product candidate will be delayed and the commercial prospects, if any, for the product candidate may suffer as a result. In addition, many of these factors may also ultimately lead to the denial of regulatory approval of a product candidate.

We may expend our limited resources to pursue a particular product candidate or indication and fail to capitalize on product candidates or indications for which there may be a greater likelihood of success.

Because we have limited financial and managerial resources, we are focused on our lead product candidate for spine fusion. As a result, we may forego or delay pursuit of opportunities with other product candidates or, for other indications for which there may be a greater likelihood of success or may prove to have greater commercial potential. Notwithstanding our investment to date and anticipated future expenditures, we may never successfully develop any marketed treatments using these products. Research programs to identify new product candidates or pursue alternative indications for current product candidates require substantial technical, financial and administrative support.

We may find it difficult to enroll patients in our clinical trials which could delay or prevent the start of clinical trials for our product candidate.

Identifying and qualifying patients to participate in clinical trials of our product candidate is essential to our success. The timing of our clinical trials depends in part on the rate at which we can recruit patients to participate in clinical trials of our product candidate, and we may experience delays in our clinical trials if we encounter difficulties in enrollment. If we experience delays in our clinical trials, the timeline for obtaining regulatory approval of our product candidate will most likely be delayed.

Many factors may affect our ability to identify, enroll and maintain qualified patients, including the following:

- eligibility criteria of our ongoing and planned clinical trials with specific characteristics appropriate for inclusion in our clinical trials;
- design of the clinical trial;
- size and nature of the patient population;
- patients' perceptions as to risks and benefits of the product candidate under study and the participation in a clinical trial generally in relation to other available therapies;
- the availability and efficacy of competing therapies and clinical trials;
- pendency of other trials underway in the same patient population;
- willingness of physicians to participate in our planned clinical trials;
- severity of the disease under investigation;
- proximity of patients to clinical sites;
- patients who do not complete the trials for personal reasons; and
- issues with Contract Research Organizations ("CROs") and/or with other vendors that handle our clinical trials.

We may not be able to initiate or continue to support clinical trials of our product candidates, for one or more applications, or any future product candidates if we are unable to locate and enroll a sufficient number of eligible participants in these trials as required by the FDA or other regulatory authorities. Even if we are able to enroll a sufficient number of patients in our clinical trials, if the pace of enrollment is slower than we expect, the development costs for our product candidate may increase and the completion of our trials may be delayed or our trials could become too expensive to complete.

If we experience delays in the completion of, or termination of, any clinical trials of our product candidate, the commercial prospects of our product candidate could be harmed, and our ability to generate product revenue from any of our product candidate could be delayed or prevented. In addition, any delays in completing our clinical trials would likely increase our overall costs, impair product candidate development and jeopardize our ability to obtain regulatory approval relative to our current plans. Any of these occurrences may harm our business, financial condition, and prospects significantly.

The results of preclinical studies are not necessarily predictive of future results. Our product candidates that may advance into clinical trials may not have favorable results in later clinical trials or receive regulatory approval.

Success in preclinical studies and early clinical trials does not ensure that later clinical trials will generate adequate data to demonstrate the efficacy and safety of a device. A number of companies in the pharmaceutical and biotechnology industries, including those with greater resources and experience than us, have suffered significant setbacks in clinical trials, even after seeing promising results in earlier preclinical studies or clinical trials.

Despite the results reported in earlier preclinical studies for our lead product candidate, we do not know whether the clinical trials we may conduct will demonstrate adequate efficacy and safety to result in regulatory approval to market our product candidate for a particular indication, in any particular jurisdiction. Efficacy data from prospectively designed trials may differ significantly from those obtained from retrospective subgroup analyses. If later-stage clinical trials do not produce favorable results, our ability to achieve regulatory approval for our product candidate may be adversely impacted. Even if we believe that we have adequate data to support an application for regulatory approval to market our current product candidate or any future product candidates, the FDA or other regulatory authorities may not agree and may require that we conduct additional clinical trials.

Risks associated with operating in foreign countries could materially adversely affect our product development.

We may conduct future studies in countries outside of the U.S. Consequently, we may be subject to risks related to operating in foreign countries. Risks associated with conducting operations in foreign countries include:

- differing regulatory requirements for device approvals and regulation of approved devices in foreign countries; more stringent privacy requirements for data to be supplied to our operations in the U.S., e.g., General Data Protection Regulation in the European Union;
- unexpected changes in tariffs, trade barriers and regulatory requirements; economic weakness, including inflation, or political instability in particular foreign economies and markets; compliance with tax, employment, immigration and labor laws for employees living or traveling abroad; foreign taxes, including withholding of payroll taxes;
- differing payor reimbursement regimes, governmental payors or patient self-pay systems and price controls;
- foreign currency fluctuations, which could result in increased operating expenses or reduced revenues, and other obligations incident to doing business or operating in another country;
- workforce uncertainty in countries where labor unrest is more common than in the U.S.;
- production shortages resulting from any events affecting raw material supply or manufacturing capabilities abroad; and
- business interruptions resulting from geopolitical actions, including war and terrorism.

Failure to obtain regulatory approval in international jurisdictions would prevent our product candidate from being marketed abroad.

In addition to regulations in the U.S., to market and sell our product candidate in the European Union, United Kingdom, many Asian countries and other jurisdictions, we must obtain separate regulatory approvals and comply with numerous and varying regulatory requirements. Approval by the FDA does not ensure approval by regulatory authorities in other countries or jurisdictions, and approval by one regulatory authority outside the U.S. does not ensure approval by regulatory authorities in other countries or jurisdictions or by the FDA. The regulatory approval process outside the U.S. generally includes all of the risks associated with obtaining FDA approval as well as risks attributable to the satisfaction of local regulations in foreign jurisdictions. The approval procedure varies among countries and can involve additional testing. The time required to obtain approval may differ substantially from that required to obtain FDA approval. We may not be able to obtain approvals from regulatory authorities outside the U.S. on a timely basis, if at all. Clinical trials accepted in one country may not be accepted by regulatory authorities in other countries. In addition, many countries outside the U.S. require that a product be approved for reimbursement before it can be approved for sale in that country. A product candidate that has been approved for sale in a particular country may not receive reimbursement approval in that country.

We may not be able to file for regulatory approvals and may not receive necessary approvals to commercialize our product in any market. If we are unable to obtain approval of any of our current product candidate or any future product candidates we may pursue by regulatory authorities in the European Union, United Kingdom, Asia or elsewhere, the commercial prospects of that product candidate may be significantly diminished, our business prospects could decline and this could materially adversely affect our business, results of operations and financial condition.

Even if our lead product candidate received regulatory approval, it may still face future development and regulatory difficulties.

Even if we obtain regulatory approval for our lead product candidate, that approval would be subject to ongoing requirements by the FDA and comparable foreign regulatory authorities governing the manufacture, quality control, further development, labeling, packaging, storage, distribution, adverse event reporting, safety surveillance, import, export, advertising, promotion, recordkeeping and reporting of safety and other post-marketing information. These requirements include submissions of safety and other post-marketing information and reports, registration, as well as continued compliance by us and/or our Contract Development Manufacturing Organizations (“CDMOs”) and CROs for any post-approval clinical trials that we may conduct. The safety profile of any product will continue to be closely monitored by the FDA and comparable foreign regulatory authorities after approval. If the FDA or comparable foreign regulatory authorities become aware of new safety information after approval of our product candidate, they may require labeling changes or establishment of a risk evaluation and mitigation strategy, impose significant restrictions on such product’s indicated uses or marketing or impose ongoing requirements for potentially costly post-approval studies or post-market surveillance.

In addition, manufacturers of devices and their facilities are subject to continual review and periodic inspections by the FDA and other regulatory authorities for compliance with Current Good Manufacturing Practice, Good Clinical Practice, and other regulations. If we or a regulatory agency discover previously unknown problems with a product, such as adverse events of unanticipated severity or frequency, or problems with the facility where the product is manufactured, a regulatory agency may impose restrictions on that product, the manufacturing facility or us, including requiring recall or withdrawal of the product from the market or suspension of manufacturing. If we, our product candidate or the manufacturing facilities for our product candidate fail to comply with applicable regulatory requirements, a regulatory agency may:

- issue warning letters or untitled letters;
- mandate modifications to promotional materials or require us to provide corrective information to healthcare practitioners;
- require us to enter into a consent decree, which can include imposition of various fines, reimbursements for inspection costs, required due dates for specific actions and penalties for noncompliance;
- seek an injunction or impose civil or criminal penalties or monetary fines;
- suspend or withdraw regulatory approval;
- suspend any ongoing clinical trials;
- refuse to approve pending applications or supplements to applications filed by us;
- suspend or impose restrictions on operations, including costly new manufacturing requirements; or
- seize or detain products, refuse to permit the import or export of products, or require us to initiate a product recall.

The occurrence of any event or penalty described above may inhibit our ability to successfully commercialize our product and generate revenues.

Advertising and promotion of any product candidates that obtains approval in the U.S. is heavily scrutinized by the FDA, the Department of Justice, the Office of Inspector General of Health and Human Services, state attorneys general, members of Congress and the public. A company can make only those claims relating to safety and efficacy, purity and potency that are approved by the FDA and in accordance with the provisions of the approved label. Additionally, advertising and promotion of any product candidate that obtains approval outside of the U.S. is heavily scrutinized by comparable foreign regulatory authorities. Violations, including actual or alleged promotion of our product for unapproved or off-label uses, are subject to enforcement letters, inquiries and investigations, and civil and criminal sanctions by the FDA, as well as prosecution under the federal False Claims Act. Any actual or alleged failure to comply with labeling and promotion requirements may have a negative impact on our business.

The results of our clinical trials may not support our product candidate claims and the results of preclinical studies and completed clinical trials are not necessarily predictive of future results.

To date, long-term safety and efficacy have not yet been demonstrated in clinical trials for any of our diagnostic product candidates. Favorable results in early studies or trials, if any, may not be repeated in later studies or trials. Even if our clinical trials are initiated and completed as planned, it cannot be certain that the results will support our product candidate claims. Success in preclinical testing and pilot clinical trials does not ensure that later pilot or pivotal clinical trials will be successful. We cannot be sure that the results of later clinical trials would replicate the results of prior clinical trials and preclinical testing. In particular, the limited results we have obtained for our tests may not predict results from studies in larger numbers of subjects drawn from more diverse populations over a longer period of time. Clinical trials may fail to demonstrate that our product candidates are safe for humans and effective for indicated uses. Any such failure could cause us to abandon a product candidate and might delay development of other product candidates. Preclinical and clinical results are frequently susceptible to varying interpretations that may delay, limit or prevent regulatory approvals or commercialization. Any delay in, or termination of, our clinical trials would delay us in obtaining FDA approval for the affected product candidate and, ultimately, our ability to commercialize that product candidate.

Risks Related to Our Dependence on Third Parties

We may fail to retain or recruit necessary personnel, and we may be unable to secure the services of consultants.

As of the date of this filing, we have two full-time employees. We also have engaged and plan to continue to engage regulatory consultants to advise us on our dealings with the FDA and other foreign regulatory authorities and have been and will be required to retain additional consultants and employees. Our future performance will depend in part on our ability to successfully integrate newly hired officers into our management team and our ability to develop an effective working relationship among senior management.

Certain of our directors, officers, scientific advisors, and consultants serve as officers, directors, scientific advisors, or consultants of other healthcare and life science companies or institutes that might be developing competitive products. Other than corporate opportunities, none of our directors are obligated under any agreement or understanding with us to make any additional products or technologies available to us. Similarly, we can give no assurances, and we do not expect and stockholders should not expect, that any biomedical or pharmaceutical product or technology identified by any of our directors or affiliates in the future would be made available to us other than corporate opportunities. We can give no assurances that any such other companies will not have interests that are in conflict with its interests.

Losing key personnel or failing to recruit necessary additional personnel would impede our ability to attain our development objectives. There is intense competition for qualified personnel in the biomedical-development field, and we may not be able to attract and retain the qualified personnel we need to develop our business.

We rely on independent organizations, advisors and consultants to perform certain services for us, including handling substantially all aspects of regulatory approval, clinical management, manufacturing, marketing, and sales. We expect that this will continue to be the case. Such services may not always be available to us on a timely basis.

We rely on third parties to supply our raw materials, and if certain manufacturing-related services do not timely supply these products and services, it may delay or impair our ability to develop, manufacture and market our products.

We rely on suppliers for raw materials and other third parties for certain manufacturing-related services to produce material that meets appropriate content, quality and stability standards and to use in clinical trials of our products. To succeed, clinical trials require adequate supplies of such materials, which may be difficult or uneconomical to procure or manufacture. We and our suppliers and vendors may not be able to (i) produce our products to appropriate standards for use in clinical studies, (ii) perform under any definitive manufacturing, supply or service agreements or (iii) remain in business for a sufficient time to successfully produce and market our product candidates. If we do not maintain important manufacturing and service relationships, we may fail to find a replacement supplier or required vendor or develop our own manufacturing capabilities which could delay or impair our ability to obtain regulatory approval for our products and substantially increase our costs or deplete profit margins, if any. If we do find replacement providers, we may not be able to enter into agreements with suppliers on favorable terms and conditions, or there could be a substantial delay before a new third party could be qualified and registered with the FDA and foreign regulatory authorities as a provider.

We depend on third parties, including researchers, who are not under our control.

We depend upon independent investigators and scientific collaborators, such as universities and medical institutions or private physician scientists, to conduct our preclinical and clinical trials under agreements. These collaborators are not our employees, and they cannot control the amount or timing of resources that they devote to their programs or the timing of their procurement of clinical-trial data or their compliance with applicable regulatory guidelines. Should any of these independent investigators and scientific collaborators become disabled or die unexpectedly, or should they fail to comply with applicable regulatory guidelines, we may be forced to scale back or terminate development of that program. They may not assign as great a priority to our programs or pursue them as diligently as we would if we were undertaking those programs ourselves. Failing to devote sufficient time and resources to our development programs, or substandard performance and failure to comply with regulatory guidelines, could result in delay of any FDA applications and our commercialization of the product candidate involved.

These collaborators may also have relationships with other commercial entities, some of which may compete with us. Our collaborators assisting our competitors at our expense could harm our competitive position. We have been and continue to be highly dependent on our strategic partner, MTF, for technical support.

Business interruptions could adversely affect future operations, revenues, and financial conditions, and may increase our costs and expenses.

Our operations, and those of our directors, advisors, contractors, consultants, CROs, and collaborators, could be adversely affected by earthquakes, floods, hurricanes, typhoons, extreme weather conditions, fires, water shortages, power failures, business systems failures, medical epidemics, and other natural and man-made disaster or business interruptions. Our phones, electronic devices and computer systems and those of our directors, advisors, contractors, consultants, CROs, and collaborators are vulnerable to damages, theft and accidental loss, negligence, unauthorized access, terrorism, war, electronic and telecommunications failures, and other natural and man-made disasters. Operating as a virtual company, our employees conduct business outside of our headquarters and leased or owned facilities. These locations may be subject to additional security and other risk factors due to the limited control of our employees. If such an event as described above were to occur in the future, it may cause interruptions in our operations, delay research and development programs, clinical trials, regulatory activities, manufacturing and quality assurance activities, sales and marketing activities, hiring, training of employees and persons within associated third parties, and other business activities. For example, the loss of clinical trial data from completed or future clinical trials could result in delays in our regulatory approval efforts and significantly increase our costs to recover or reproduce the data.

Likewise, we will rely on third parties to manufacture our product candidates and conduct clinical trials, and similar events as those described in the prior paragraph relating to their business systems, equipment and facilities could also have a material adverse effect on our business. To the extent that any disruption or security breach were to result in a loss of, or damage to, our data or applications, or inappropriate disclosure of confidential or proprietary information, we could incur liability and the further development and commercialization of our product candidate could be delayed or altogether terminated.

Our employees may engage in misconduct or other improper activities, including noncompliance with regulatory standards and requirements, which could cause significant liability for us and harm our reputation.

We are exposed to the risk of employee fraud or other misconduct, including intentional failures to comply with FDA regulations or similar regulations of comparable foreign regulatory authorities, provide accurate information to the FDA or comparable foreign regulatory authorities, comply with manufacturing standards we have established, comply with federal and state healthcare fraud and abuse laws and regulations and similar laws and regulations established and enforced by comparable foreign regulatory authorities, report financial information or data accurately or disclose unauthorized activities to us. Employee misconduct could also involve the improper use of information obtained in the course of clinical trials, which could result in regulatory sanctions and serious harm to our reputation. It is not always possible to identify and deter employee misconduct, and the precautions we take to detect and prevent this activity may not be effective in controlling unknown or unmanaged risks or losses or in protecting us from governmental investigations or other actions or lawsuits stemming from a failure to be in compliance with such laws or regulations. If any such actions are instituted against us, and we are not successful in defending ourselves or asserting our rights, those actions could have a significant impact on our business and results of operations, including the imposition of significant civil, criminal and administrative penalties, damages, fines, imprisonment, exclusion from government funded healthcare programs, such as Medicare and Medicaid, and integrity oversight and reporting obligations.

Risks Related to our Intellectual Property

We rely on patents and patent applications and various regulatory exclusivities to protect some of our product candidates, and our ability to compete may be limited or eliminated if we are not able to protect our products.

The patent positions of medical device companies are uncertain and involve complex legal and factual questions. We may incur significant expenses in protecting our intellectual property and defending or assessing claims with respect to intellectual property owned by others. Any patent or other infringement litigation by or against us could cause us to incur significant expenses and divert the attention of our management.

Others may file patent applications or obtain patents on similar technologies that compete with our products. We cannot predict how broad the claims in any such patents or applications will be and whether they will be allowed. Once claims have been issued, we cannot predict how they will be construed or enforced. We may infringe upon intellectual property rights of others without being aware of it. If another party claims we are infringing their technology, we could have to defend an expensive and time consuming lawsuit, pay a large sum if we are found to be infringing, or be prohibited from selling or licensing our products unless we obtain a license or redesign our products, which may not be possible.

We also rely on trade secrets and proprietary know-how to develop and maintain our competitive position. Some of our current or former employees, consultants, scientific advisors, contractors, current or prospective corporate collaborators, may unintentionally or willfully disclose our confidential information to competitors or use our proprietary technology for their own benefits. Furthermore, enforcing a claim alleging the infringement of our trade secrets would be expensive and difficult to prove, making the outcome uncertain. Our competitors may also independently develop similar knowledge, methods, and know-how or gain access to our proprietary information through some other means.

We may incur substantial costs as a result of litigation or other proceedings relating to patent and other intellectual property rights, as well as costs associated with lawsuits.

If any other person filed patent applications, or is issued patents, claiming technology also claimed by us, we may be required to participate in interference or derivation proceedings in the U.S. Patent and Trademark Office to determine priority and/or ownership of the invention. Our licensors or we may also need to participate in interference proceedings involving issued patents and pending applications of another entity.

The intellectual property environment in our industry is particularly complex, constantly evolving and highly fragmented. Other companies and institutions have issued patents and have filed or will file patent applications that may issue into patents that cover or attempt to cover products, processes or technologies similar to us. We have not conducted freedom-to-use patent searches on all aspects of our product candidates or potential product candidates, and may be unaware of relevant patents and patent applications of third parties. In addition, the freedom-to-use patent searches that have been conducted may not have identified all relevant issued patents or pending patent applications. We cannot provide assurance that our proposed products in this area will not ultimately be held to infringe one or more valid claims owned by third parties which may exist or come to exist in the future or that in such case we will be able to obtain a license from such parties on acceptable terms.

We cannot guarantee that our technologies will not conflict with the rights of others. In some foreign jurisdictions, we could become involved in opposition proceedings, either by opposing the validity of others' foreign patents or by persons opposing the validity of our foreign patents.

We may also face frivolous litigation or lawsuits from various competitors or from litigious securities attorneys. The cost of any litigation or other proceeding relating to these areas, even if deemed frivolous or resolved in our favor, could be substantial and could distract management from its business. Uncertainties resulting from initiation and continuation of any litigation could have a material adverse effect on our ability to continue our operations.

We cannot be certain we will be able to obtain patent protection to protect our product candidates and technology.

We cannot be certain that all patents applied for will be issued. If a third party has also filed a patent application relating to an invention claimed by us or one or more of our licensors, we may be required to participate in an interference or derivation proceeding declared or instituted by the United States Patent and Trademark Office, which could result in substantial uncertainties and cost for us, even if the eventual outcome is favorable to us. The degree of future patent protection for our product candidates and technology is uncertain. For example:

- we or our licensors might not have been the first to make the inventions covered by our issued patents, or pending or future patent applications;
- we or our licensors might not have been the first to file patent applications for the inventions;
- others may independently develop duplicative, similar or alternative technologies;
- it is possible that our patent applications will not result in an issued patent or patents, or that the scope of protection granted by any patents arising from our patent applications will be significantly narrower than expected;
- any patents under which we hold ultimate rights may not provide us with a basis for commercially-viable products, may not provide us with any competitive advantages or may be challenged by third parties as not infringed, invalid, or unenforceable under United States or foreign laws;
- any patent issued to us in the future or under which we hold rights may not be valid or enforceable; or
- we may develop additional technologies that are not patentable and which may not be adequately protected through trade secrets; for example, if a competitor independently develops duplicative, similar, or alternative technologies.

If we fail to comply with our obligations in the agreements under which we may license intellectual property rights from third parties or otherwise experience disruptions to our business relationships with our licensors, we could lose rights that are important to our business.

We have entered and may be required to enter into intellectual property license agreements that are important to our business, including our license agreement with UCLA TDG. These license agreements may impose various diligence, milestone payment, royalty and other obligations on us, such as those imposed by the license agreement with UCLA TDG. For example, we may enter into exclusive license agreements with various third parties (for example, universities and research institutions) and may be required to use commercially reasonable efforts to engage in various development and commercialization activities with respect to licensed products, and may need to satisfy specified milestones and royalty payment obligations. If we fail to comply with any obligations under our agreements with any of these licensors, we may be subject to termination of the license agreements in whole or in part; increased financial obligations to our licensors or loss of exclusivity in a particular field or territory, in which case our ability to develop or commercialize products covered by the license agreements will be impaired.

In addition, disputes may arise regarding intellectual property subject to a license agreement, including:

- the scope of rights granted under the license agreement and other interpretation-related issues;
- the extent to which our technology, products, methods and processes infringe on intellectual property of the licensor that is not subject to the licensing agreement;
- our diligence obligations under the license agreement and what activities satisfy those obligations;
- if a third party expresses interest in an area under a license that we are not pursuing, under the certain terms of our license agreement, we may be required to sublicense rights in that area to the third party, and that sublicense could harm our business; and
- the ownership of inventions and know-how resulting from the joint creation or use of intellectual property by our licensors and us.

If disputes over the intellectual property that we have licensed prevent or impair our ability to maintain our current licensing arrangements on acceptable terms, we may be unable to successfully develop and commercialize the affected product candidates.

We may need to obtain licenses from third parties to advance our research to allow commercialization of our product candidates. We may fail to obtain any of these licenses at a reasonable cost or on reasonable terms, if at all. In that event, we would be unable to further develop and commercialize one or more of our product candidates, which could harm our business significantly.

We may infringe the intellectual property rights of others, which may prevent or delay our product development efforts, stop us from commercializing or increase the costs of commercializing our product candidates, and force us to pay damages.

Our success will depend in part on our ability to operate without infringing the proprietary rights of third parties. We cannot guarantee that our products or product candidates, or manufacture or use of our products or product candidates, will not infringe third-party patents. Furthermore, a third party may claim that we are using inventions covered by the third party's patent rights and may go to court to stop us from engaging in our normal operations and activities, including making or selling our product candidates or products. These lawsuits are costly and could affect our results of operations and divert the attention of managerial and scientific personnel. Some of these third parties may be better capitalized and have more resources than us. There is a risk that a court would decide that we are infringing the third party's patents and would order us to stop the activities covered by the patents. In that event, we may not have a viable way to get around the patent and may need to halt commercialization of the relevant product candidate(s) or product(s). In addition, there is a risk that a court will order us to pay the other party damages for having violated the other party's patents. In addition, we may be obligated to indemnify our licensors and collaborators against certain intellectual property infringement claims brought by third parties, which could require us to expend additional resources. The pharmaceutical, medical device and biotechnology industries have produced a proliferation of patents, and it is not always clear to industry participants, including us, which patents cover various types of products or methods. The coverage of patents is subject to interpretation by the courts, and the interpretation is not always uniform.

If we are sued for patent infringement, we would need to demonstrate that our products or methods either do not infringe the claims of the relevant patent or that the patent claims are invalid or unenforceable, and we may not be able to do this. Proving invalidity is difficult. For example, in the United States, proving invalidity requires a showing of clear and convincing evidence to overcome the presumption of validity enjoyed by issued patents. Even if we are successful in these proceedings, we may incur substantial costs and divert management's time and attention in pursuing these proceedings, which could have a material adverse effect on us. If we are unable to avoid infringing the patent rights of others, we may be required to seek a license, which may not be available, and then we will have to defend an infringement action or challenge the validity of the patent in court. Patent litigation is costly and time consuming. We may not have sufficient resources to bring these actions to a successful conclusion. In addition, if we do not obtain a license, fail to develop or obtain non-infringing technology, fail to defend an infringement action successfully or have infringed patents declared invalid or unenforceable, we may incur substantial monetary damages, encounter significant delays in bringing our product candidates to market and be precluded from manufacturing or selling our product candidates.

We cannot be certain that others have not filed patent applications for technology covered by our pending applications, or that we were the first to invent the technology, because:

- some patent applications in the United States may be maintained in secrecy until the patents are issued;
- patent applications in the United States are typically not published until 18 months after the priority date; and
- publications in the scientific literature often lag behind actual discoveries.

Our competitors may have filed, and may in the future file, patent applications covering technology similar to ours. Any such patent applications may have priority over our patent applications, which could further require us to obtain rights to issued patents covering such technologies. If another party has filed US patent applications on inventions similar to ours that claims priority to any applications filed prior to the priority dates of our applications, we may have to participate in an interference proceeding declared or a derivation proceed instituted by the USPTO to determine priority of invention in the United States. The costs of these proceedings could be substantial, and it is possible that such efforts would be unsuccessful if, unbeknownst to us, the other party had independently arrived at the same or similar inventions prior to our own inventions, resulting in a loss of our U.S. patent position with respect to such inventions. Other countries have similar laws that permit secrecy of patent applications, and thus the third party's patent or patent application may be entitled to priority over our applications in such jurisdictions.

Some of our competitors may be able to sustain the costs of complex patent litigation more effectively than we can because they have substantially greater resources. In addition, any uncertainties resulting from the initiation and continuation of any litigation could have a material adverse effect on our ability to raise the funds necessary to continue our operations.

We may be subject to claims that our employees, consultants or independent contractors have wrongfully used or disclosed alleged trade secrets.

As is common in the medical device, biotechnology and pharmaceutical industries, we employ, and may employ in the future, individuals who were previously employed at other medical device, biotechnology or pharmaceutical companies, including our competitors or potential competitors. Although we try to ensure that our employees, consultants and independent contractors do not use the proprietary information or know-how of others in their work for us, we may be subject to claims that we or our employees, consultants or independent contractors have inadvertently or otherwise used or disclosed trade secrets or other proprietary information of their former employers. Litigation may be necessary to defend against these claims. If we fail in defending any such claims, in addition to paying monetary damages, we could lose valuable intellectual property rights or personnel, which could adversely impact our business. Even if we are successful in defending against these claims, litigation could result in substantial costs and be a distraction to management.

Our intellectual property may not be sufficient to protect our products from competition, which may negatively affect our business as well as limit our partnership or acquisition appeal.

We may be subject to competition despite the existence of intellectual property we license or own. We can give no assurances that our intellectual property will be sufficient to prevent third parties from designing around the patents we own or license and developing and commercializing competitive products. The existence of competitive products that avoid our intellectual property could materially adversely affect our operating results and financial condition. Furthermore, limitations, or perceived limitations, in our intellectual property may limit the interest of third parties to partner, collaborate or otherwise transact with us, if third parties perceive a higher than acceptable risk to commercialization of our products or future products.

Our approach involves filing patent applications covering new methods of use and/or new formulations of previously known, studied and/or marketed devices. Although the protection afforded by patents issued from our patent applications may be significant, when looking at our patents' ability to block competition, the protection offered by our patents may be, to some extent, more limited than the protection provided by patents claiming the composition of matter previously unknown. If a competitor were able to successfully design around any method of use and formulation patents we may have in the future, our business and competitive advantage could be significantly affected.

We may elect to sue a third party, or otherwise make a claim, alleging infringement or other violation of patents, trademarks, trade dress, copyrights, trade secrets, domain names or other intellectual property rights that we either own or license. If we do not prevail in enforcing our intellectual property rights in this type of litigation, we may be subject to:

- paying monetary damages related to the legal expenses of the third party;
- facing additional competition that may have a significant adverse effect on our product pricing, market share, business operations, financial condition, and the commercial viability of our products; and
- restructuring our company or delaying or terminating select business opportunities, including, but not limited to, research and development, clinical trials, and commercialization activities, due to a potential deterioration of our financial condition or market competitiveness.

A third party may also challenge the validity, enforceability or scope of the intellectual property rights that we license or own; and, the result of these challenges may narrow the claim scope of or invalidate patents that are integral to our product candidates in the future. There can be no assurance that we will be able to successfully defend patents we own or licensed in an action against third parties due to the unpredictability of litigation and the high costs associated with intellectual property litigation, amongst other factors.

The laws of some jurisdictions do not protect intellectual property rights to the same extent as the laws or rules and regulations in the United States and Europe, and many companies have encountered significant difficulties in protecting and defending such rights in such jurisdictions. The legal systems of certain countries, particularly certain developing countries, do not favor the enforcement of patents, trade secrets and other intellectual property protection, which could make it difficult for us to stop the infringement of our patents or marketing of competing products in violation of our proprietary rights generally. Proceedings to enforce our patent rights in other jurisdictions, whether or not successful, could result in substantial costs and divert our efforts and attention from other aspects of our business, could put our patents at risk of being invalidated, rendered unenforceable or interpreted narrowly and our patent applications at risk of not issuing, and could provoke third parties to assert claims against us. We may not prevail in any lawsuits that we initiate, and the damages or other remedies awarded, if any, may not be commercially meaningful. Accordingly, our efforts to enforce our intellectual property rights around the world may be inadequate to obtain a significant commercial advantage from the intellectual property that we develop or license. Furthermore, while we intend to protect our intellectual property rights in our expected significant markets, we cannot ensure that we will be able to initiate or maintain similar efforts in all jurisdictions in which we may wish to market our products or product candidates. Accordingly, our efforts to protect our intellectual property rights in such countries may be inadequate, which may have an adverse effect on our ability to successfully commercialize our product candidates in all of our expected significant foreign markets. If we or our licensors encounter difficulties in protecting, or are otherwise precluded from effectively protecting, the intellectual property rights important for our business in such jurisdictions, the value of these rights may be diminished, and we may face additional competition from others in those jurisdictions.

Changes to patent law, for example the Leahy-Smith America Invents Act, AIA or Leahy-Smith Act, of 2011 and the Patent Reform Act of 2009 and other future article of legislation in the U.S., may substantially change the regulations and procedures surrounding patent applications, issuance of patents, prosecution of patents, challenges to patent validity, and patent enforcement. We can give no assurances that our patents and those of our licensor(s) can be defended or will protect us against future intellectual property challenges, particularly as they pertain to changes in patent law and future patent law interpretations.

In addition, enforcing and maintaining our intellectual property protection depends on compliance with various procedural, document submission, fee payment and other requirements imposed by the U.S. Patent and Trademark Office and courts, and foreign government patent agencies and courts, and our patent protection could be reduced or eliminated for non-compliance with these requirements.

If we are not able to protect and control our unpatented trade secrets, know-how and other technological innovation, we may suffer competitive harm.

We also rely on proprietary trade secrets and unpatented know-how to protect our research and development activities, particularly when we do not believe that patent protection is appropriate or available. However, trade secrets are difficult to protect. We will attempt to protect our trade secrets and unpatented know-how by requiring our employees, consultants, collaborators, and advisors to execute a confidentiality and non-use agreement. We cannot guarantee that these agreements will provide meaningful protection, that these agreements will not be breached, that we will have an adequate remedy for any such breach, or that our trade secrets will not otherwise become known or independently developed by a third party. Our trade secrets, and those of our present or future collaborators that we utilize by agreement, may become known or may be independently discovered by others, which could adversely affect the competitive position of our product candidates.

We may incur substantial costs enforcing our patents, defending against third-party patents, invalidating third-party patents or licensing third-party intellectual property, as a result of litigation or other proceedings relating to patent and other intellectual property rights.

We may be unaware of or unfamiliar with prior art and/or interpretations of prior art that could potentially impact the validity or scope of our patents, pending patent applications, or patent applications that we will file. We may have elected, or elect now or in the future, not to maintain or pursue intellectual property rights that, at some point in time, may be considered relevant to or enforceable against a competitor.

We take efforts and enter into agreements with employees, consultants, collaborators, and advisors to confirm ownership and chain of title in intellectual property rights. However, an inventorship or ownership dispute could arise that may permit one or more third parties to practice or enforce our intellectual property rights, including possible efforts to enforce rights against us.

We may not have rights under some patents or patent applications that may cover technologies that we use in our research, product candidates and particular uses thereof that we seek to develop and commercialize, as well as synthesis of our product candidates. Third parties may own or control these patents and patent applications in the United States and elsewhere. These third parties could bring claims against us or our collaborators that would cause us to incur substantial expenses and, if successful against us, could cause us to pay substantial damages. Further, if a patent infringement suit were brought against us or our collaborators, we or they could be forced to stop or delay research, development, manufacturing or sales of the product or product candidate that is the subject of the suit. We or our collaborators therefore may choose to seek, or be required to seek, a license from the third-party and would most likely be required to pay license fees or royalties or both. These licenses may not be available on acceptable terms, or at all. Even if we or our collaborators were able to obtain a license, the rights may be nonexclusive, which would give our competitors access to the same intellectual property. Ultimately, we could be prevented from commercializing a product or product candidate, or forced to cease some aspect of our business operations, as a result of patent infringement claims, which could harm our business.

There has been substantial litigation and other legal proceedings regarding patent and other intellectual property rights in the pharmaceutical, medical device and biotechnology industries. Although we are not currently a party to any patent litigation or any other adversarial proceeding, including any interference or derivation proceeding declared or instituted before the United States Patent and Trademark Office, regarding intellectual property rights with respect to our products, product candidates and technology, it is possible that we may become so in the future. We are not currently aware of any actual or potential third-party infringement claim involving our product candidates. The cost to us of any patent litigation or other proceeding, even if resolved in our favor, could be substantial. The outcome of patent litigation is subject to uncertainties that cannot be adequately quantified in advance, including the demeanor and credibility of witnesses and the identity of the adverse party, especially in pharmaceutical, medical device and biotechnology related patent cases that may turn on the testimony of experts as to technical facts upon which experts may reasonably disagree. Some of our competitors may be able to sustain the costs of such litigation or proceedings more effectively than we can because of their substantially greater financial resources. If a patent or other proceeding is resolved against us, we may be enjoined from researching, developing, manufacturing or commercializing our products or product candidates without a license from the other party and we may be held liable for significant damages. We may not be able to obtain any required license on commercially acceptable terms or at all.

Uncertainties resulting from the initiation and continuation of patent litigation or other proceedings could harm our ability to compete in the marketplace. Patent litigation and other proceedings may also absorb significant management time.

If we are unable to protect our intellectual property rights, our competitors may develop and market products with similar features that may reduce demand for our potential products.

The following factors are important to our success:

- receiving patent protection for our product candidates;
- preventing others from infringing our intellectual property rights; and
- maintaining our patent rights and trade secrets.

We will be able to protect our intellectual property rights in patents and trade secrets from unauthorized use by third parties only to the extent that such intellectual property rights are covered by valid and enforceable patents or are effectively maintained as trade secrets.

Because issues of patentability involve complex legal and factual questions, the issuance, scope and enforceability of patents cannot be predicted with certainty. Patents may be challenged, invalidated, found unenforceable, or circumvented. United States patents and patent applications may be subject to interference and derivation proceedings, United States patents may also be subject to post grant proceedings, including re-examination, derivation, *Inter Partes* Review and Post Grant Review, in the United States Patent and Trademark Office and foreign patents may be subject to opposition or comparable proceedings in corresponding foreign patent offices, which could result in either loss of the patent or denial of the patent application or loss or reduction in the scope of one or more of the claims of the patent or patent application. In addition, such interference, derivation, post grant and opposition proceedings may be costly. Thus, any patents that we own or license from others may not provide any protection against competitors. Furthermore, an adverse decision in an interference or derivation proceeding can result in a third-party receiving the patent rights sought by us, which in turn could affect our ability to market a potential product to which that patent filing was directed. Our pending patent applications, those that we may file in the future, or those that we may license from third parties may not result in patents being issued. If issued, they may not provide us with proprietary protection or competitive advantages against competitors with similar technology. Furthermore, others may independently develop similar technologies or duplicate any technology that we have developed. Many countries, including certain countries in Europe, have compulsory licensing laws under which a patent owner may be compelled to grant licenses to third parties. For example, compulsory licenses may be required in cases where the patent owner has failed to “work” the invention in that country, or the third-party has patented improvements. In addition, many countries limit the enforceability of patents against government agencies or government contractors. In these countries, the patent owner may have limited remedies, which could materially diminish the value of our patents. Moreover, the legal systems of certain countries, particularly certain developing countries, do not favor the enforcement of patents and other intellectual property protection, which makes it difficult to stop infringement.

In addition, our ability to enforce our patent rights depends on our ability to detect infringement. It is difficult to detect infringers who do not advertise or otherwise promote the compositions that are used in their products. Any litigation to enforce or defend our patent rights, even if we prevail, could be costly and time-consuming and would divert the attention of management and key personnel from business operations.

We will also rely on trade secrets, know-how and technology, which are not protected by patents, to maintain our competitive position. We will seek to protect this information by entering into confidentiality agreements with parties that have access to it, such as strategic partners, collaborators, employees, contractors and consultants. Any of these parties may breach these agreements and disclose our confidential information or our competitors might learn of the information in some other way. If any trade secret, know-how or other technology not protected by a patent were disclosed to, or independently developed by, a competitor, our business, financial condition and results of operations could be materially adversely affected.

Risks Relating to Commercializing of our Lead Product Candidate and Future Product Candidates

Our commercial success and ability to generate revenue depends upon attaining significant market acceptance of our lead product candidate and future product candidates, if approved, among physicians, patients, healthcare payors and treatment centers.

Our future financial performance will depend upon the introduction and customer acceptance of our products. Even if we obtain regulatory approval for our lead product candidate or any future product candidates, the products may not gain market acceptance among physicians, healthcare payors, patients or the medical community, including treatment centers. Market acceptance of any product candidates for which we receive approval depends on a number of factors, including:

- receipt of regulatory approval of marketing claims for the uses that we are developing;
- the efficacy and safety of such product candidates as demonstrated in clinical trials;
- the clinical indications and patient populations for which the product candidate is approved;
- acceptance by physicians, major treatment centers and patients of the product candidates as a safe and effective treatment;
- the potential and perceived advantages of product candidates over alternative treatments;
- relative convenience and ease of administration;
- the safety of product candidates seen in a broader patient group, including our use outside the approved indications;
- any restrictions on use together with other medications;
- the prevalence and severity of any side effects;
- product labeling or product insert requirements of the FDA or other regulatory authorities;
- the timing of market introduction of our product as well as competitive products;
- the development of manufacturing and distribution processes for commercial scale manufacturing for our current product candidate and any future product candidates;
- the cost of treatment in relation to alternative treatments;
- the availability of coverage and adequate reimbursement from government and third-party payors, such as insurance companies, health maintenance organizations and other health plan administrators;
- our ability to attract corporate partners, including medical device, biotechnology and pharmaceutical companies, to assist in commercializing our proposed products; and
- the effectiveness of our sales and marketing efforts and those of our collaborators.

Physicians, patients, payors or the medical community in general may be unwilling to accept, utilize or recommend any of our proposed formulations or products. If our current product and any future product candidates are approved but fail to achieve market acceptance, we will not be able to generate significant revenues, which would compromise our ability to become profitable.

Even if we are able to commercialize our lead product candidate or any future product candidates, the products may not receive coverage and adequate reimbursement from third-party payors in the U.S. and in other countries in which we seek to commercialize our products, which could harm our business.

Our ability to commercialize any product successfully will depend, in part, on the extent to which coverage and adequate reimbursement for such product and related treatments will be available from third-party payors, including government health administration authorities, private health insurers and other organizations.

Third-party payors determine which medications they will cover and establish reimbursement levels. A primary trend in the healthcare industry is cost containment. Third-party payors have attempted to control costs by limiting coverage and the amount of reimbursement for particular medications. Increasingly, third-party payors are requiring that biomedical companies provide them with predetermined discounts from list prices and are challenging the prices charged for medical products. Third-party payors may also seek additional clinical evidence, beyond the data required to obtain regulatory approval, demonstrating clinical benefit and value in specific patient populations before covering our product for those patients. We cannot be sure that coverage and adequate reimbursement will be available for any product that we commercialize and, if coverage is available, what the level of reimbursement will be. Coverage and reimbursement may impact the demand for, or the price of, any product candidate for which we obtain regulatory approval. If reimbursement is not available or is available only at limited levels, we may not be able to successfully commercialize any product candidate for which we obtain regulatory approval.

There may be significant delays in obtaining coverage and reimbursement for newly approved devices, and coverage may be more limited than the purposes for which the device is approved by the FDA or comparable foreign regulatory authorities. Moreover, eligibility for coverage and reimbursement does not imply that any device will be paid for in all cases or at a rate that covers our costs, including research, development, manufacture, sale and distribution. Interim reimbursement levels for new devices, if applicable, may also not be sufficient to cover our costs and may only be temporary. Reimbursement rates may vary according to the use of the device and the clinical setting in which it is used, may be based on reimbursement levels already set for lower cost devices and may be incorporated into existing payments for other services. Net prices for devices may be reduced by mandatory discounts or rebates required by third-party payors and by any future relaxation of laws that presently restrict imports of devices from countries where they may be sold at lower prices than in the U.S. No uniform policy for coverage and reimbursement exists in the U.S., and coverage and reimbursement can differ significantly from payor to payor. Third-party payors often rely upon Medicare coverage policy and payment limitations in setting their own reimbursement policies, but also have their own methods and approval process apart from Medicare determinations. Our inability to promptly obtain coverage and profitable reimbursement rates from both government-funded and private payors for any approved product that we develop could have a material adverse effect on our operating results, ability to raise capital needed to commercialize our product and overall financial condition.

Healthcare legislative measures aimed at reducing healthcare costs may have a material adverse effect on our business and results of operations.

The business and financial condition of biotechnology companies are affected by the efforts of governmental and third-party payors to contain or reduce the cost of healthcare. The U.S. Congress has enacted legislation to reform the healthcare system. While we anticipate that this legislation may, over time, increase the number of patients who have insurance coverage for our products, it also imposes cost containment measures that may adversely affect the amount of reimbursement for our products. The measures include increasing the minimum rebates for products covered by Medicaid programs. In addition, such legislation contains a number of provisions designed to generate the revenues necessary to fund coverage expansion, including new fees or taxes on certain health related industries, including medical device manufacturers. Some states are also considering legislation that would control the prices of drugs. Managed care organizations continue to seek price discounts and, in some cases, to impose restrictions on coverage. Government efforts to reduce Medicaid expenses may lead to increased use of managed care organizations. This would result in managed care organizations influencing decisions in a corresponding constraint on prices and reimbursement. We are unable to predict what additional legislation or regulation relating to the health care industry or third-party coverage and reimbursement may be enacted or what effect such legislation or regulation would have on our business. Pendency or approval of future proposals or reforms could result in a decrease in our stock price or limit our ability to raise capital or to obtain strategic partnerships or licenses.

There have been, and likely will continue to be, legislative and regulatory proposals at the foreign, federal and state levels directed at containing or lowering the cost of healthcare. We cannot predict the initiatives that may be adopted in the future. The continuing efforts of the government, insurance companies, managed care organizations and other payors of healthcare services to contain or reduce costs of healthcare and/or impose price controls may adversely affect:

- the demand for our product candidate, if we obtain regulatory approval;
- our ability to receive or set a price that we believe is fair for our product;
- our ability to generate revenue and achieve or maintain profitability;
- the level of taxes that we are required to pay; and
- the availability of capital.

We expect that the ACA, as well as other healthcare reform measures that may be adopted in the future, may result in additional reductions in Medicare and other healthcare funding, more rigorous coverage criteria, lower reimbursement and new payment methodologies. This could lower the price that we receive for any approved product. Any denial in coverage or reduction in reimbursement from Medicare or other government-funded programs may result in a similar denial or reduction in payments from private payors, which may prevent us from being able to generate sufficient revenue, attain profitability or commercialize our product candidate, if approved.

Risks Related to Our Business Operations

We operate in a highly competitive environment.

The medical device industry is characterized by rapidly evolving technology and intense competition. Our competitors include major multi-national orthopedic and med-tech companies developing both generic and proprietary therapies to treat serious diseases. Many of these companies are well-established and possess technical, human, research and development, financial and sales and marketing resources significantly greater than ours. In addition, many of our potential competitors have formed strategic collaborations, partnerships and other types of joint ventures with larger, well established industry competitors that afford these companies potential research and development and commercialization advantages in the therapeutic areas we are currently pursuing.

Academic research centers, governmental agencies and other public and private research organizations are also conducting and financing research activities which may produce products directly competitive to those being developed by us. In addition, many of these competitors may be able to obtain patent protection, obtain FDA and other regulatory approvals, and begin commercial sales of their products before us.

Our future success is dependent, in part, on the performance and continued service of our officers and directors.

We are presently dependent largely upon the experience, abilities and continued services of Jeffrey Frelick, our President and Chief Executive Officer, and Deina Walsh, our Chief Financial Officer. The loss of services of Mr. Frelick or Ms. Walsh could have a material adverse effect on our business, financial condition or results of operations. If we lose the services of any of these individuals, we might not be able to find suitable replacements on a timely basis or at all, and our business could be harmed as a result.

We might not be able to attract or retain qualified management and other key personnel in the future due to the intense competition for qualified personnel among biotechnology, pharmaceutical and other businesses. We could have difficulty attracting experienced personnel to our company and may be required to expend significant financial resources in our employee recruitment and retention efforts. Many of the other biotechnology companies with whom we compete for qualified personnel have greater financial and other resources, different risk profiles and longer histories in the industry than we do. They also may provide more diverse opportunities and better chances for career advancement. If we are not able to attract and retain the necessary personnel to accomplish our business objectives, we may experience constraints that will harm our ability to implement our business strategy and achieve our business objectives.

Competitors could develop and/or gain FDA approval of our products for a different indication.

Another company may obtain FDA approval for similar products that might adversely affect our ability to develop and market our product candidates in the U.S. We are aware that other companies have intellectual property protection and have conducted clinical trials. Many of these companies may have more resources than us. We cannot provide any assurances that our product candidates will be FDA-approved prior to our competitors.

The FDA does not regulate the practice of medicine and, as a result, cannot direct physicians to select certain products for their patients. Consequently, we might be limited in our ability to prevent off-label use of a competitor's product to treat the diseases we intend our product candidates to address, even if we have issued method of use patents for that indication. If we are not able to obtain and enforce our patents, a competitor could develop and commercialize similar products for the same indications that we are pursuing. We cannot provide any assurances that a competitor will not obtain FDA approval for a product that contains the same active ingredients as our products.

We face substantial competition, which may result in others discovering, developing or commercializing products before or more successfully than we do.

We face competition from numerous medical device, pharmaceutical and biotechnology enterprises, as well as from academic institutions, government agencies and private and public research institutions for our current product candidate or future product candidates. Our commercial opportunities will be reduced or eliminated if our competitors develop and commercialize products that are safer, more effective, have fewer side effects or are less expensive than any products that we may develop. Competition could result in reduced sales and pricing pressure on our current product candidate or future product candidates, if approved, which in turn would reduce our ability to generate meaningful revenues and have a negative impact on our results of operations. In addition, significant delays in the development of our product candidates could allow our competitors to bring products to market before we do and impair our ability to commercialize our product candidates. The biotechnology industry is intensely competitive and involves a high degree of risk. We compete with other companies that have far greater experience and financial, research and technical resources than us. Potential competitors in the U.S. and worldwide are numerous and include medical device, pharmaceutical and biotechnology companies, educational institutions and research foundations, many of which have substantially greater capital resources, marketing experience, research and development staffs and facilities than ours. Some of our competitors may develop and commercialize products that compete directly with those incorporating our technology or may introduce products to market earlier than our product candidates or on a more cost-effective basis. Our competitors compete with us in recruiting and retaining qualified scientific and management personnel as well as in acquiring technologies complementary to our technology. We may face competition with respect to product efficacy and safety, ease of use and adaptability to various modes of administration, acceptance by physicians, the timing and scope of regulatory approvals, availability of resources, reimbursement coverage, price and patent position, including the potentially dominant patent positions of others. An inability to successfully complete our product development or commercializing our product candidates could result in our having limited prospects for establishing market share or generating revenue.

Many of our competitors or potential competitors have significantly greater established presence in the market, financial resources and expertise in research and development, manufacturing, preclinical testing, conducting clinical trials, obtaining regulatory approvals and marketing approved products than we do, and as a result may have a competitive advantage over us. Mergers and acquisitions in the medical device, pharmaceutical and biotechnology industries may result in even more resources being concentrated among a smaller number of our competitors. Smaller or early-stage companies may also prove to be significant competitors, particularly through collaborative arrangements with large and established companies. These third parties compete with us in recruiting and retaining qualified scientific and management personnel, establishing clinical trial sites and patient registration for clinical trials, as well as in acquiring technologies and technology licenses complementary to our programs or potentially advantageous to our business.

As a result of these factors, these competitors may obtain regulatory approval of their products before we are able to obtain patent protection or other intellectual property rights, which will limit our ability to develop or commercialize our current product candidate or future product candidates. Our competitors may also develop devices that are safer, more effective, more widely used and cheaper than ours, and may also be more successful than us in manufacturing and marketing their products. These appreciable advantages could render our product candidates obsolete or non-competitive before we can recover the expenses of development and commercialization.

The impact of public health crises is difficult to predict and could materially and adversely affect our business and results of operations.

Any adverse widespread public health developments in locations where we conduct business, as well as any governmental restrictive measures implemented to control such outbreaks and consumer responses to such outbreaks, could have a material adverse impact on our business and results of operations. For instance, our clinical trials may be affected by a public health crisis. Site initiation, participant recruitment and enrollment, and study monitoring and data analysis may be paused or delayed due to changes in hospital or university policies, federal, state or local regulations, prioritization of hospital resources toward the public health crisis efforts, or other reasons related to the public health crisis. During a public health crisis, some participants and clinical investigators may not be able to comply with clinical trial protocols. For example, quarantines or other travel limitations (whether voluntary or required) may impede participant movement, affect sponsor access to study sites, or interrupt healthcare services, and we may be unable to conduct our clinical trials. Further, if our operations are adversely impacted by a public health crisis, we risk a delay, default and/or non-performance under existing agreements which may increase our costs. These cost increases may not be fully recoverable or adequately covered by insurance.

Additionally, infections and deaths related to a public health crisis may disrupt the United States' healthcare and healthcare regulatory systems. Such disruptions could divert healthcare resources away from, or materially delay FDA review and/or approval with respect to, our clinical trials. We cannot predict how long these disruptions could continue, were they to occur. Any elongation or de-prioritization of our clinical trials or delay in regulatory review resulting from such disruptions could materially affect the development and study of our product candidates. Furthermore, we currently utilize third parties to, among other things, manufacture raw materials. Third-parties in the supply chain for materials used in the production of our product candidates may be adversely impacted by restrictions resulting from public health crises which could limit our ability to manufacture our product candidates for our clinical trials and research and development operations. These impacts could be significant and long term. Further, any actions taken to mitigate any health crises could lead to an economic recession. For example, the COVID-19 pandemic and the efforts to control it caused significantly increased economic uncertainty, global inflationary pressure, supply chain disruptions, volatility in the capital markets, significant economic deterioration, and an increasingly competitive labor market.

The ultimate impact of a public health crisis on our business operations will depend on, among other things, the severity and length of the health crisis, the duration, effectiveness and extent of the mitigation measures and actions designed to contain the outbreak, the emergence, contagiousness and threat of new and different strains of the disease, the availability and efficacy of vaccines and effective treatments, public acceptance of vaccines and treatments for the disease, if any, as well as the resulting economic conditions and how quickly and to what extent normal economic and operating conditions resume, all of which are highly uncertain. Such extraordinary events and their aftermaths can cause investor fear and panic, which could further materially and adversely affect our operations, the economies in which we operate, and the financial markets generally in ways that cannot necessarily be predicted and which may reduce our ability to access capital either at all or on favorable terms. In addition, a recession, depression or other sustained adverse market event resulting from a public health crisis could materially and adversely affect our business and the value of our common stock.

Significant disruptions of information technology systems, computer system failures or breaches of information security could adversely affect our business.

We rely and plan to rely to a large extent upon sophisticated information technology systems to operate our business. In the ordinary course of business, we collect, store and transmit large amounts of confidential information (including, but not limited to, personal information and intellectual property). The size and complexity of our information technology and information security systems, and those of our third-party vendors with whom we may contract, make such systems potentially vulnerable to service interruptions or to security breaches from inadvertent or intentional actions by our employees or vendors, or from malicious attacks by third parties. Such attacks are of ever-increasing levels of sophistication and are made by groups and individuals with a wide range of motives (including, but not limited to, industrial espionage and market manipulation) and expertise. While we intend to invest in the protection of data and information technology, there can be no assurance that our efforts will prevent service interruptions or security breaches.

Our internal computer systems, and those of our CROs, our CDMOs, and other business vendors on which we may rely, are vulnerable to damage from computer viruses, unauthorized access, natural disasters, fire, terrorism, war and telecommunication and electrical failures. We exercise little or no control over these third parties, which increases our vulnerability to problems with their systems. If such an event were to occur and cause interruptions in our operations, it could result in a material disruption of our development programs. Any interruption or breach in our systems could adversely affect our business operations or result in the loss of critical or sensitive confidential information or intellectual property, and could result in financial, legal, business and reputational harm to us or allow third parties to gain material, inside information that they use to trade in our securities. For example, the loss of clinical trial data from completed or ongoing clinical trials could result in delays in our regulatory approval efforts and significantly increase our costs to recover or reproduce the data. To the extent that any disruption or security breach results in a loss of or damage to our data or applications, or inappropriate disclosure of confidential or proprietary information, we could incur liability, the further development of our current and future product candidates could be delayed and our business could be otherwise adversely affected.

We will need to grow the size of our organization in the future, and we may experience difficulties in managing this growth.

As of the date of this filing, we had two full-time employees. We will need to grow the size of our organization in order to support our continued development and potential commercialization of our product candidate. As our development and commercialization plans and strategies continue to develop, our need for additional managerial, operational, manufacturing, sales, marketing, financial and other resources may increase. Our management, personnel and systems currently in place may not be adequate to support this future growth. Future growth would impose significant added responsibilities on members of management, including:

- managing our clinical trials effectively;
- identifying, recruiting, maintaining, motivating and integrating additional employees;
- managing our internal development efforts effectively while complying with our contractual obligations to licensors, licensees, contractors and other third parties;
- improving our managerial, development, operational, information technology, and finance systems; and
- expanding our facilities.

If our operations expand, we will also need to manage additional relationships with various strategic partners, suppliers and other third parties. Our future financial performance and our ability to commercialize our product candidate and to compete effectively will depend, in part, on our ability to manage any future growth effectively, as well as our ability to develop a sales and marketing force when appropriate for our company. To that end, we must be able to manage our development efforts and preclinical studies and clinical trials effectively and hire, train and integrate additional management, research and development, manufacturing, administrative and sales and marketing personnel. The failure to accomplish any of these tasks could prevent us from successfully growing our company.

Product liability lawsuits against us could cause us to incur substantial liabilities and to limit commercialization of any products that we may develop.

We face an inherent risk of product liability exposure related to the testing of our current product candidate or future product candidates in human clinical trials and will face an even greater risk if we commercially sell any products that we may develop. Product liability claims may be brought against us by subjects enrolled in our clinical trials, patients, healthcare providers or others using, administering or selling our product. If we cannot successfully defend ourselves against claims that our product candidate or product caused injuries, we could incur substantial liabilities. Regardless of merit or eventual outcome, liability claims may result in:

- decreased demand for any product candidates or products that we may develop;
- termination of clinical trial sites or entire clinical trial programs;
- injury to our reputation and significant negative media attention;
- withdrawal of clinical trial participants;
- significant costs to defend the related litigation;
- substantial monetary awards to trial subjects or patients;
- loss of revenue;
- diversion of management and scientific resources from our business operations; and
- the inability to commercialize any products that we may develop.

Prior to engaging in our first-in-man pilot clinical study in Australia, we obtained product liability insurance coverage at a level that we believe is customary for similarly situated companies and adequate to provide us with insurance coverage for foreseeable risks. Prior to engaging in future clinical trials, we intend to obtain product liability insurance coverage at a level that we believe is customary for similarly situated companies and adequate to provide us with insurance coverage for foreseeable risks; however, we may be unable to obtain such coverage at a reasonable cost, if at all. If we are able to obtain product liability insurance, we may not be able to maintain insurance coverage at a reasonable cost or in an amount adequate to satisfy any liability that may arise and such insurance may not be adequate to cover all liabilities that we may incur. Furthermore, we intend to expand our insurance coverage for products to include the sale of commercial products if we obtain regulatory approval for our product candidate in development, but we may be unable to obtain commercially reasonable product liability insurance for any products that receive regulatory approval. Large judgments have been awarded in class action lawsuits based on devices that had unanticipated side effects. A successful product liability claim or series of claims brought against us, particularly if judgments exceed our insurance coverage, could decrease our cash and adversely affect our business.

Our ability to use net operating losses to offset future taxable income may be subject to limitations.

As of December 31, 2022, we had federal net operating loss, or NOLs, carryforwards of approximately \$35,757,000. Our NOLs generated in tax years ending on or prior to December 31, 2017 are only permitted to be carried forward for 20 years under applicable U.S. tax laws, and will begin to expire, if not utilized, beginning in 2027. These NOL carryforwards could expire unused and be unavailable to offset future income tax liabilities. Under the Tax Act, federal NOLs incurred in tax years ending after December 31, 2017 may be carried forward indefinitely, but the deductibility of such federal NOLs is limited. It is uncertain if and to what extent various states will conform to the Tax Act, or whether any further regulatory changes may be adopted in the future that could minimize its applicability. In addition, under Section 382 of the Internal Revenue Code of 1986, as amended, and certain corresponding provisions of state law, if a corporation undergoes an “ownership change,” which is generally defined as a greater than 50% change, by value, in the ownership of its equity over a three-year period, the corporation’s ability to use its pre-change NOL carryforwards and other pre-change tax attributes to offset its post-change income may be limited.

Risks Related to Healthcare Compliance Regulations

Our relationships with customers and third-party payors will be subject to applicable anti-kickback, fraud and abuse and other healthcare laws and regulations, which could expose us to criminal sanctions, civil penalties, contractual damages, reputational harm and diminished profits and future earnings. If we or they are unable to comply with these provisions, we may become subject to civil and criminal investigations and proceedings that could have a material adverse effect on our business, financial condition and prospects.

Healthcare providers, physicians and third-party payors will play a primary role in the recommendation and prescription of any product candidates for which we obtain regulatory approval. Our current and future arrangements with healthcare providers, healthcare entities, third-party payors and customers may expose us to broadly applicable fraud and abuse and other healthcare laws and regulations that may constrain the business or financial arrangements and relationships through which we research, develop and will market, sell and distribute our product. As a pharmaceutical company, even though we do not and will not control referrals of healthcare services or bill directly to Medicare, Medicaid or other third-party payors, federal and state healthcare laws and regulations pertaining to fraud and abuse and patients’ rights are applicable to our business. Restrictions under applicable federal and state healthcare laws and regulations that may affect our ability to operate include the following:

- the federal healthcare Anti-Kickback Statute which prohibits, among other things, individuals and entities from knowingly and willfully soliciting, offering, receiving or providing remuneration, directly or indirectly, overtly or covertly, in cash or in kind, to induce or reward, or in return for, either the referral of an individual for, or the purchase, order or recommendation of, any good or service, for which payment may be made under a federal healthcare program such as Medicare and Medicaid;
- federal civil and criminal false claims laws, including the federal False Claims Act that can be enforced through civil whistleblower or qui tam actions, and civil monetary penalty laws, prohibit individuals or entities from knowingly presenting, or causing to be presented, to the federal government, including the Medicare and Medicaid programs, claims for payment or approval that are false or fraudulent or making a false statement to avoid, decrease or conceal an obligation to pay money to the federal government;
- the federal Health Insurance Portability and Accountability Act of 1996 (“HIPAA”) which imposes criminal and civil liability for executing a scheme to defraud any healthcare benefit program and also created federal criminal laws that prohibit knowingly and willfully falsifying, concealing or covering up a material fact or making any materially false statements in connection with the delivery of or payment for healthcare benefits, items or services, as amended by the Health Information Technology for Economic and Clinical Health Act of 2009 (“HITECH”) which imposes obligations, including mandatory contractual terms, with respect to safeguarding the privacy, security and transmission of individually identifiable health information on entities subject to the law, such as certain healthcare providers, health plans, and healthcare clearinghouses, known as covered entities, and their respective business associates that perform services for them that involve the creation, use, maintenance or disclosure of, individually identifiable health information;
- the federal physician sunshine requirements under the ACA which requires certain manufacturers of , devices, biologics and medical supplies, with certain exceptions, to report annually to HHS information related to payments and other transfers of value to physicians, other healthcare providers, and teaching hospitals, and ownership and investment interests held by physicians and other healthcare providers and their immediate family members and applicable group purchasing organizations;

- analogous state and foreign laws and regulations, such as state anti-kickback and false claims laws, which may apply to sales or marketing arrangements and claims involving healthcare items or services reimbursed by non-governmental third-party payors, including private insurers; some state laws which require pharmaceutical companies to comply with the pharmaceutical industry's voluntary compliance guidelines and the relevant compliance guidance promulgated by the federal government and may require device manufacturers to report information related to payments and other transfers of value to physicians and other healthcare providers, marketing expenditures or pricing information; and certain state and local laws which require the registration of pharmaceutical sales representatives; and
- state and foreign laws govern the privacy and security of health information in specified circumstances, many of which differ from each other in significant ways and often are not pre-empted by HIPAA, thus complicating compliance efforts.

Efforts to ensure that our business arrangements with third parties will comply with applicable healthcare laws and regulations will involve substantial costs. It is possible that governmental authorities will conclude that our business practices may not comply with current or future statutes, regulations or case law involving applicable fraud and abuse or other healthcare laws and regulations. If our operations are found to be in violation of any of these laws or any other governmental regulations that may apply to us, we may be subject to significant civil, criminal and administrative penalties, damages, fines, imprisonment, disgorgement, exclusion from government funded healthcare programs, such as Medicare and Medicaid, integrity oversight and reporting obligations, and the curtailment or restructuring of our operations. If any physicians or other healthcare providers or entities with whom we expect to do business are found to not be in compliance with applicable laws, they may be subject to criminal, civil or administrative sanctions, including exclusions from government funded healthcare programs.

The application of privacy provisions of HIPAA is uncertain.

The application of privacy provisions of HIPAA is uncertain. HIPAA, among other things, protects the privacy and security of individually identifiable health information by limiting its use and disclosure. HIPAA directly regulates "covered entities" (healthcare providers, insurers and clearinghouses) and indirectly regulates "business associates" with respect to the privacy of patients' medical information. All entities that receive and process protected health information are required to adopt certain procedures to safeguard the security of that information. It is uncertain whether we would be deemed to be a covered entity under HIPAA, and it is unlikely that we, based on our current business model, would be a business associate. Nevertheless, we may be contractually required to physically safeguard the integrity and security of any patient information that we receive, store, create or transmit. If we fail to adhere to our contractual commitments, then certain of our contract counterparties may be subject to civil monetary penalties and this could adversely affect our ability to market our product. If we are deemed to be a vendor, under the Health Information Technology for Economic and Clinical Health Act, enacted as part of the American Recovery and Reinvestment Act of 2009, then we will be obligated to adopt various security measures. We may also be subject to state and foreign privacy laws under which breaches could lead to substantial fines and liability.

General Risk Factors

If we are unable to establish appropriate internal financial reporting controls and procedures, it could cause us to fail to meet our reporting obligations, result in the restatement of our financial statements, harm our operating results, subject us to regulatory scrutiny and sanction, cause investors to lose confidence in our reported financial information and have a negative effect on the market price for shares of our common stock.

Effective internal controls are necessary for us to provide reliable financial reports and to effectively prevent fraud. We maintain a system of internal control over financial reporting, which is defined as a process designed by, or under the supervision of, our principal executive officer and principal financial officer, or persons performing similar functions, and effected by our Board of Directors, management and other personnel, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles.

As of December 31, 2022, management assessed the effectiveness of our internal controls over financial reporting, and based on that evaluation, they concluded that our internal controls and procedures were effective.

As a public company, we have significant additional requirements for enhanced financial reporting and internal controls. We are required to document and test our internal control procedures in order to satisfy the requirements of Section 404 of the Sarbanes-Oxley Act of 2002, which requires annual management assessments of the effectiveness of our internal controls over financial reporting. The process of designing and implementing effective internal controls is a continuous effort that requires us to anticipate and react to changes in our business and the economic and regulatory environments and to expend significant resources to maintain a system of internal controls that is adequate to satisfy our reporting obligations as a public company.

We cannot assure you that we will not, in the future, identify areas requiring improvement in our internal control over financial reporting. We cannot assure you that the measures we will take to remediate any areas in need of improvement will be successful or that we will implement and maintain adequate controls over our financial processes and reporting in the future as we continue our growth. If we are unable to establish appropriate internal financial reporting controls and procedures, it could cause us to fail to meet our reporting obligations, result in the restatement of our financial statements, harm our operating results, subject us to regulatory scrutiny and sanction, cause investors to lose confidence in our reported financial information and have a negative effect on the market price for shares of our common stock.

The price of our common stock may fluctuate substantially.

You should consider an investment in our common stock to be risky. Some factors that may cause the market price of our common stock to fluctuate, in addition to the other risks mentioned in this “Risk Factors” section are:

- our ability to meet the Nasdaq listing requirements;
- volatility and limitations in trading volumes of our shares of common stock;
- our ability to obtain financing to conduct and complete research and development activities including, but not limited to, our clinical trials, and other business activities;
- the timing and success of our clinical trials and introduction of products to the market;
- changes in the development status of our product candidate;
- any delays or adverse developments or perceived adverse developments with respect to the FDA’s review of our planned preclinical and clinical trials;
- safety concerns related to the use of our product candidate;
- changes in our capital structure or dividend policy, future issuances of securities, sales of large blocks of common stock by our stockholders;
- our cash position;
- announcements and events surrounding financing efforts, including debt and equity securities;
- changes in general economic, political and market conditions in or any of the regions in which we conduct our business;
- analyst research reports, recommendation and changes in recommendations, price targets, and withdrawals of coverage;
- departures and additions of key personnel;
- disputes and litigation;
- changes in applicable laws, rules, regulations, or accounting practices and other dynamics; and
- other events or factors, many of which may be out of our control.

In addition, if the market for stock in our industry or industries related to our industry, or the stock market in general, experiences a loss of investor confidence, the trading price of our common stock could decline for reasons unrelated to our business, financial condition and results of operations. If any of the foregoing occurs, it could cause our stock price to fall and may expose us to lawsuits that, even if unsuccessful, could be costly to defend and a distraction to management.

We may be at risk of securities class action litigation.

We may be at risk of securities class action litigation. In the past, medical device, biotechnology and pharmaceutical companies have experienced significant stock price volatility, particularly when associated with binary events such as clinical trials and product approvals. If we face such litigation, it could result in substantial costs and a diversion of management’s attention and resources, which could harm our business and results in a decline in the market price of our common stock.

Market and economic conditions may negatively impact our business, financial condition and share price.

Concerns over public health crises, energy costs, terrorism and geopolitical issues, the U.S. mortgage market and a deteriorating real estate market, unstable global credit and financial markets and financial conditions, inflationary pressures and interest rate changes, and volatile oil prices have led to periods of significant economic instability, diminished liquidity and credit availability, declines in consumer confidence and discretionary spending, diminished expectations for the global economy and expectations of slower global economic growth, increased unemployment rates, and increased credit defaults in recent years. More recently, the closures of Silicon Valley Bank and Signature Bank and their placement into receivership with the Federal Deposit Insurance Corporation (FDIC) created bank-specific and broader financial institution liquidity risk and concerns. Future adverse developments with respect to specific financial institutions or the broader financial services industry may lead to market-wide liquidity shortages, impair the ability of companies to access near-term working capital needs, and create additional market and economic uncertainty. There can be no assurance that future credit and financial market instability and a deterioration in confidence in economic conditions will not occur.

Our general business strategy may be adversely affected by any such economic downturn, liquidity shortages, volatile business environment or continued unpredictable and unstable market conditions. If these conditions or the equity markets deteriorate, or if adverse developments are experienced by financial institutions, it may cause short-term liquidity risk and also make any necessary equity financing more difficult, more costly and more dilutive. Failure to secure any necessary financing in a timely manner and on favorable terms could have a material adverse effect on our business plans and stock price and could require us to delay or abandon clinical development plans. In addition, there is a risk that one or more of our current service providers, financial institutions, manufacturers and other partners may be adversely affected by the foregoing risks, which could directly affect our ability to conduct our business plans on schedule and on budget.

If securities or industry analysts do not publish research or reports, or publish unfavorable research or reports about our business, our stock price and trading volume may decline.

The trading market for our common stock relies in part on the research and reports that industry or financial analysts publish about us, our business, our markets and our competitors. We do not control these analysts. If securities analysts do not cover our common stock, the lack of research coverage may adversely affect the market price of our common stock. Furthermore, if one or more of the analysts who do cover us downgrade our stock or if those analysts issue other unfavorable commentary about us or our business, our stock price would likely decline. If one or more of these analysts cease coverage of us or fails to regularly publish reports on us, we could lose visibility in the market and interest in our stock could decrease, which in turn could cause our stock price or trading volume to decline and may also impair our ability to expand our business with existing customers and attract new customers.

We do not intend to pay cash dividends on our shares of common stock so any returns will be limited to the value of our shares.

We currently anticipate that we will retain future earnings, if any, for the development, operation and expansion of our business and do not anticipate declaring or paying any cash dividends for the foreseeable future. Any return to stockholders will therefore be limited to the increase, if any, of our share price.

Our Certificate of Incorporation, Bylaws, and Delaware law have anti-takeover effects that could discourage, delay or prevent a change in control, which may cause our stock price to decline.

Our Certificate of Incorporation, Bylaws, and Delaware law could make it more difficult for a third party to acquire us, even if closing such a transaction would be beneficial to our stockholders. We are authorized to issue up to 20,000,000 shares of preferred stock. This preferred stock may be issued in one or more series, the terms of which may be determined at the time of issuance by our Board of Directors without further action by stockholders. The terms of any series of preferred stock may include voting rights (including the right to vote as a series on particular matters), preferences as to dividend, liquidation, conversion and redemption rights and sinking fund provisions. The issuance of any preferred stock could materially adversely affect the rights of the holders of our common stock, and therefore, reduce the value of our common stock. In particular, specific rights granted to future holders of preferred stock could be used to restrict our ability to merge with, or sell our assets to, a third party and thereby preserve control by the present management.

Provisions of our Certificate of Incorporation and our Bylaws and Delaware law also could have the effect of discouraging potential acquisition proposals or making a tender offer or delaying or preventing a change in control, including changes a stockholder might consider favorable. Such provisions may also prevent or frustrate attempts by our stockholders to replace or remove our management. In particular, the certificate of incorporation and bylaws and Delaware law, as applicable, among other things:

- provide the Board of Directors with the ability to alter the Bylaws without stockholder approval;
- place limitations on the removal of directors;
- establishing advance notice requirements for nominations for election to the Board of Directors or for proposing matters that can be acted upon at stockholder meetings; and
- provide that vacancies on the Board of Directors may be filled by a majority of directors in office, although less than a quorum.

Provisions of our warrants could discourage an acquisition of us by a third party.

In addition to the discussion of the provisions of our Certificate of Incorporation and our Bylaws, certain provisions of our warrants could make it more difficult or expensive for a third party to acquire us. The warrants prohibit us from engaging in certain transactions constituting “fundamental transactions” unless, among other things, the surviving entity assumes our obligations under the warrants. These and other provisions of the warrants could prevent or deter a third party from acquiring us even where the acquisition could be beneficial to you.

Financial reporting obligations of being a public company in the U.S. are expensive and time-consuming, and our management will be required to devote substantial time to compliance matters.

As a publicly traded company we incur significant additional legal, accounting and other expenses. The obligations of being a public company in the U.S. require significant expenditures and will place significant demands on our management and other personnel, including costs resulting from public company reporting obligations under the Exchange Act and the rules and regulations regarding corporate governance practices, including those under the Sarbanes-Oxley Act, the Dodd-Frank Wall Street Reform and Consumer Protection Act, the Jumpstart Our Business Startups Act, and the listing requirements of the stock exchange on which our securities are listed. These rules require the establishment and maintenance of effective disclosure and financial controls and procedures, internal control over financial reporting and changes in corporate governance practices, among many other complex rules that are often difficult to implement, monitor and maintain compliance with. These reporting requirements, rules, and regulations will make some activities more time-consuming and costly and may make it more difficult and more expensive for us to maintain director and officer liability insurance. Our management and other personnel will need to devote a substantial amount of time to ensure that we comply with all of these requirements and to keep pace with new regulations, otherwise we may fall out of compliance and risk becoming subject to litigation or being delisted, among other potential problems.

USE OF PROCEEDS

We estimate that the net proceeds from this offering if 100% of the securities in this offering are sold will be approximately \$4,265,462.40 after deducting estimated placement agent fees and estimated offering expenses payable by us and assuming no sale of any pre-funded warrants and no exercise of the warrants. However, because this is a best efforts offering with no minimum number of securities or amount of proceeds as a condition to closing, the actual offering amount, the placement agent's fees and net proceeds to us are not presently determinable and may be substantially less than the maximum amounts set forth on the cover page of this prospectus, and we may not sell all or any of the securities we are offering. As a result, we may receive significantly less in net proceeds.

We intend to use the net proceeds from this offering in the following order of priority: to fund clinical trials, maintain and extend our patent portfolio, and for working capital and other general corporate purposes. The actual allocation of proceeds realized from this offering will depend upon how many securities are sold in this best efforts offering and upon our cash position and working capital requirements. Therefore, as of the date of this prospectus, we cannot specify with certainty all of the particular uses for the net proceeds to be received upon the completion of this offering. Accordingly, we will have discretion in the application of the net proceeds, and investors will be relying on our judgment regarding the application of the proceeds of this offering. Pending our use of the net proceeds from this offering, we intend to invest the net proceeds in a variety of capital preservation investments, including short-term, investment-grade, interest-bearing instruments and U.S. government securities.

CAPITALIZATION

The following table sets forth our capitalization as of September 30, 2023 as follows:

- on an actual basis;
- on a pro forma basis to reflect net proceeds from the issuance of 142,384 shares of common stock at an offering price of \$5.12 per share in the November Offering; and
- on a pro forma, as adjusted basis to reflect the issuance and sale by us of shares of common stock and accompanying warrants in this offering at an assumed public offering price of \$ per share and accompanying warrant (the last reported sale price of our common stock on Nasdaq on , 2024) and after deducting placement agent fees and estimated offering expenses payable by us, and assuming no sale of any pre-funded warrants in this offering, no exercise of warrants being offered in this offering, that no value is attributed to such warrants and that such warrants are classified as and accounted for as equity.

The information below is illustrative only. Our capitalization following the closing of this offering will change based on how many securities are sold in the offering, the actual public offering price and other terms of this offering determined at pricing. You should read this table in conjunction with “Management’s Discussion and Analysis of Financial Condition and Results of Operations” and the financial statements and related notes included in this prospectus.

	As of September 30, 2023		
	Unaudited, Actual	Unaudited, Pro Forma	Unaudited, Pro Forma As Adjusted
Cash	\$ 4,452,586	\$ 5,044,584	\$
Long-term debt, net of discounts	—	—	—
Stockholders’ Equity			
Preferred Stock, \$0.001 par value per share; 20,000,000 shares authorized; none issued or outstanding at September 30, 2023	—	—	—
Common stock, \$0.001 par value per share; 100,000,000 shares authorized; 391,799 shares issued and outstanding at September 30, 2023	392	534	
Additional paid in capital	83,151,790	83,743,646	
Accumulated Deficit	(79,359,073)	(79,359,073)	(79,359,073)
Total stockholders’ equity	3,793,109	4,385,107	
Total capitalization	\$ 3,793,109	\$ 4,385,107	\$

The number of shares of our common stock outstanding set forth in the table above excludes, as of September 30, 2023:

- 34,310 shares of common stock issuable upon exercise of stock options outstanding;
- 197,844 shares of common stock issuable upon exercise of outstanding common stock warrants, including 150,926 warrants issued in November 2023 in a private placement;
- 595,179 shares of common stock reserved for future grants pursuant to our 2015 Equity Incentive Plan;
- shares of our common stock issuable upon the exercise of the warrants to be issued in this offering; and
- shares of our common stock issuable upon the exercise of the placement agent warrants to be issued in this offering.

DILUTION

If you invest in our securities in this offering, your ownership interest will be immediately diluted to the extent of the difference between the combined public offering price per share and accompanying warrant and the pro forma, as adjusted net tangible book value per share of our common stock immediately after this offering.

As of September 30, 2023, we had a historical net tangible book value of \$3,793,109, or \$9.68 per share of common stock, based on 391,854 shares of common stock outstanding at September 30, 2023. Our historical net tangible book value per share is the amount of our total tangible assets less our total liabilities at September 30, 2023, divided by 391,854 shares of common stock.

Our pro forma net tangible book value as of September 30, 2023 was \$4,385,107, or approximately \$8.21 per share after taking into account the pro forma adjustments described in “Capitalization.”

The information discussed below is illustrative only and will be adjusted based on the actual public offering price, the actual number of securities sold in this offering and other terms of this offering determined at pricing. You should read this table in conjunction with “Management’s Discussion and Analysis of Financial Condition and Results of Operations” and the financial statements and related notes included in this prospectus.

After giving effect to the sale of _____ shares of common stock and accompanying warrants in this offering at an assumed public offering price of \$ _____ per share and accompanying warrant (the last reported sale price of our common stock on Nasdaq on _____, 2024), and after deducting placement agent fees and estimated offering expenses payable by us, and assuming no sale of any pre-funded warrants in this offering, no exercise of the warrants being offered in this offering, that no value is attributed to such warrants and that such warrants are classified as and accounted for as equity, our pro forma as adjusted net tangible book value as of September 30, 2023 would have been approximately \$ _____, or approximately \$ _____ per share of common stock. This amount represents an immediate increase in the pro forma net tangible book value after this offering of \$ _____ per share to our existing stockholders and an immediate dilution of \$ _____ per share to investors participating in this offering. We determine dilution per share to investors participating in this offering by subtracting the pro forma, as adjusted net tangible book value per share after giving effect to this offering from the assumed public offering price per share and accompanying warrant paid by investors participating in this offering. The following table illustrates this dilution:

Assumed public offering price per share and accompanying warrant		\$
Historical net tangible book value per share as of September 30, 2023	\$	9.68
Pro forma adjustments ⁽¹⁾		(1.47)
Pro forma net tangible book value per share	\$	8.21
Decrease in net tangible book value per share attributable to new investors	\$	
Pro forma, as adjusted net tangible book value per share after this offering		
Immediate dilution in pro forma net tangible book value per share to new investors		\$

(1) Represents the issuance of 142,384 shares of common stock at an offering price of \$5.12 per share in the November Offering.

Each \$0.25 increase (decrease) in the assumed public offering price of \$ _____ per share and accompanying warrant would increase (decrease) the pro forma, as adjusted net tangible book value per share after this offering by approximately \$ _____ per share and the dilution to new investors purchasing securities in this offering by \$ _____ per share, assuming the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same, and after deducting placement agent fees and estimated offering expenses payable by us.

We may also increase or decrease the number of shares we are offering. A 500,000 share increase in the number of shares offered by us, as set forth on the cover page of this prospectus, would increase the pro forma, as adjusted net tangible book value per share by approximately \$ _____ and decrease the dilution per share to new investors participating in this offering by approximately \$ _____, based on an assumed public offering price of \$ _____ per share and accompanying warrant, which was the last reported sale price of our common stock on Nasdaq on _____, 2024, remaining the same and after deducting placement agent fees and estimated offering expenses payable by us. Similarly, a 500,000 share decrease in the number of shares offered by us, as set forth on the cover page of this prospectus, would decrease the pro forma, as adjusted net tangible book value per share by approximately \$ _____ and increase the dilution per share to new investors participating in this offering by approximately \$ _____, based on an assumed public offering price of \$ _____ per share, remaining the same and after deducting placement agent fees and estimated offering expenses payable by us.

In addition, we may choose to raise additional capital due to market conditions or strategic considerations even if we believe we have sufficient funds for our current or future operating plans. To the extent that additional capital is raised through the sale of equity or convertible debt securities, the issuance of these securities could result in further dilution to our stockholders.

The number of shares of our common stock outstanding set forth in the table above excludes, as of September 30, 2023:

- 34,310 shares of common stock issuable upon exercise of stock options outstanding;
- 197,844 shares of common stock issuable upon exercise of outstanding common stock warrants, including 150,926 warrants issued in November 2023 in a private placement;
- 595,179 shares of common stock reserved for future grants pursuant to our 2015 Equity Incentive Plan;
- _____ shares of our common stock issuable upon the exercise of the warrants to be issued in this offering; and
- _____ shares of our common stock issuable upon the exercise of the placement agent warrants to be issued in this offering.

MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

You should read the following discussion and analysis of our financial condition and results of our operations together with our consolidated financial statements and the notes thereto appearing elsewhere in this prospectus. This discussion contains forward-looking statements reflecting our current expectations, whose actual outcomes involve risks and uncertainties. Actual results and the timing of events may differ materially from those stated in or implied by these forward-looking statements due to a number of factors, including those discussed in the sections entitled "Risk Factors," "Cautionary Note Concerning Forward-Looking Statements," and elsewhere in this prospectus.

Overview

We are a medical device company that is currently focused on bone regeneration in spinal fusion using the recombinant human protein known as NELL-1. NELL-1 in combination with DBM, demineralized bone matrix, is an osteopromotive recombinant protein that provides target specific control over bone regeneration. The NELL-1 technology platform has been licensed exclusively for worldwide applications to us through a technology transfer from UCLA TDG. UCLA TDG and the Company received guidance from the FDA that NELL-1/DBM will be classified as a device/drug combination product that will require an FDA-approved PMA before it can be commercialized in the United States.

We were founded by University of California professors in collaboration with an Osaka University professor and a University of Southern California surgeon in 2004 as a privately-held company with proprietary, patented technology that has been validated in sheep and non-human primate models to facilitate bone growth. We believe our platform technology has application in delivering improved outcomes in the surgical specialties of spinal, orthopedic, general orthopedic, plastic reconstruction, neurosurgery, interventional radiology, and sports medicine. Lead product development and clinical studies are targeted on spinal fusion surgery, one of the larger segments in the orthopedic market.

We are a development stage entity. The production and marketing of our products and ongoing research and development activities are subject to extensive regulation by numerous governmental authorities in the United States. Prior to marketing in the United States, any combination product developed by us must undergo rigorous preclinical (animal) and clinical (human) testing and an extensive regulatory approval process implemented by the FDA under the Federal Food, Drug, and Cosmetic Act. There can be no assurance that we will not encounter problems in clinical trials that will cause us or the FDA to delay or suspend the clinical trials.

Our success will depend in part on our ability to obtain patents and product license rights, maintain trade secrets, and operate without infringing on the proprietary rights of others, both in the United States and other countries. There can be no assurance that patents issued to or licensed by us will not be challenged, invalidated, rendered unenforceable, or circumvented, or that the rights granted thereunder will provide proprietary protection or competitive advantages to us.

UCLA TDG Exclusive License Agreement

Effective April 9, 2019, we entered into an Amended and Restated Exclusive License Agreement dated as of March 21, 2019, which was subsequently amended through three sets of amendments (as so amended the "Amended License Agreement") with the UCLA TDG. The Amended License Agreement amends and restates the Amended and Restated Exclusive License Agreement, dated as of June 19, 2017 (the "2017 Agreement"). The 2017 Agreement amended and restated the Exclusive License Agreement, effective March 15, 2006, between the Company and UCLA TDG, as amended by ten amendments. Under the terms of the Amended License Agreement, the Regents have continued to grant us exclusive rights to develop and commercialize NELL-1 (the "Licensed Product") for spinal fusion by local administration, osteoporosis and trauma applications. The Licensed Product is a recombinant human protein growth factor that is essential for normal bone development.

We have agreed to pay an annual maintenance fee to UCLA TDG of \$10,000 as well as pay certain royalties to UCLA TDG under the Amended License Agreement at the rate of 3.0% of net sales of licensed products or licensed methods. We must pay the royalties to UCLA TDG on a quarterly basis. Upon a first commercial sale, we also must pay a minimum annual royalty between \$50,000 and \$250,000, depending on the calendar year which is after the first commercial sale. If we are required to pay any third party any royalties as a result of us making use of UCLA TDG patents, then we may reduce the royalty owed to UCLA TDG by 0.333% for every percentage point paid to a third party. If we grant sublicense rights to a third party to use the UCLA TDG patent, then we will pay UCLA TDG 10% to 20% of the sublicensing income we receive from such sublicense.

We are obligated to make the following milestone payments to UCLA TDG for each Licensed Product or Licensed Method:

- \$100,000 upon enrollment of the first subject in a Feasibility Study;
- \$250,000 upon enrollment of the first subject in a Pivotal Study;
- \$500,000 upon Pre-Market Approval of a Licensed Product or Licensed Method; and
- \$1,000,000 upon the First Commercial Sale of a Licensed Product or Licensed Method.

We are also obligated pay to UCLA TDG a fee (the “Diligence Fee”) of \$8,000,000 upon the sale of any Licensed Product (the “Triggering Sale Date”) in accordance with the payment schedule below:

- Due upon cumulative Net Sales equaling \$50,000,000 following the Triggering Sale Date - \$2,000,000;
- Due upon cumulative Net Sales equaling \$100,000,000 following the Triggering Sale Date - \$2,000,000; and
- Due upon cumulative Net Sales equaling \$200,000,000 following the Triggering Sale Date - \$4,000,000.

Our obligation to pay the Diligence Fee will survive termination or expiration of the Amended License Agreement and we are prohibited from assigning, selling, or otherwise transferring any of its assets related to any Licensed Product unless our Diligence Fee obligation is assigned, sold, or transferred along with such assets, or unless we pay UCLA TDG the Diligence Fee within ten (10) days of such assignment, sale or other transfer of such rights to any Licensed Product.

We are also obligated to pay UCLA TDG a cash milestone payment within thirty (30) days of a Liquidity Event (including a Change of Control Transaction and a payment election by UCLA TDG exercisable after December 22, 2016) such payment to equal the greater of:

- \$500,000; or
- 2% of all proceeds in connection with a Change of Control Transaction.

As of September 30, 2023, none of the above milestones have been met.

We are obligated to diligently proceed with developing and commercializing licensed products under UCLA TDG patents set forth in the Amended License Agreement. We are required to meet certain diligence milestone deadlines pursuant to the Amended License Agreement. Applicable for the current year, we are required to spend at least \$1,000,000 per calendar year on pre-clinical or clinical development until the date that we complete a Phase III pivotal study. If we fail to meet this or the other diligence milestone deadlines, UCLA TDG has the right to either terminate the license or reduce the license to a non-exclusive license.

We must reimburse or pre-pay UCLA TDG for patent prosecution and maintenance costs incurred during the term of the Amended License Agreement. We have the right to bring infringement actions against third party infringers of the Amended License Agreement, UCLA TDG may join voluntarily, at its own expense, or, at our expense, be joined involuntarily to the action. We are required to indemnify UCLA TDG against any third party claims arising out of our exercise of the rights under the Amended License Agreement or any sublicense.

Payments to UCLA TDG under the Amended License Agreement for the nine months ended September 30, 2023 and 2022 were \$23,238 and \$35,235, respectively.

Results of Operations

Since our inception, we devoted substantially all of our efforts and funding to the development of the NELL-1 protein and raising capital. We have not yet generated revenues from our planned operations.

Three Months ended September 30, 2023 compared to the Three Months ended September 30, 2022

	Three-months ended September 30, 2023	Three-months ended September 30, 2022	% Change
Operating expenses			
Research and development	\$ 1,574,850	\$ 769,410	104.68%
General and administrative	506,040	449,867	12.49%
Total operating expenses	2,080,890	1,219,277	70.67%
Loss from operations	(2,080,890)	(1,219,277)	70.67%
Change in fair value of warrant liability	160,645	-	100.00%
Interest income	536	-	100.00%
Net loss	\$ (1,919,709)	\$ (1,219,277)	57.45%

Research and Development

Our research and development costs increased from \$769,410 during the three months ended September 30, 2022 to \$1,574,850 during the three months ended September 30, 2023. The increase of \$805,440 is primarily due to development activities for our Nell-1 protein as we prepare for our pilot clinical study. We will continue to incur significant expenses for development activities for NELL-1 in the future.

General and Administrative

Our general and administrative expenses increased from \$449,867 during the three months ended September 30, 2022 to \$506,040 during the three months ended September 30, 2023. The \$56,173 increase was primarily due to consultants for the annual proxy and to assist with the NASDAQ notice. The incentive bonus accruals were based on performance targets established for each fiscal year.

Change in fair value of warrant liability

In October 2022, we completed a public equity offering, which included the issuance of 54,173 warrants. The warrants provide for a Black Scholes value calculation in the event of certain transactions, which includes a floor on volatility utilized in the value calculation at 100% or greater. We have determined that this provision introduces leverage to the holders of the warrants that could result in a value that would be greater than the settlement amount of a fixed-for-fixed option on the Company’s own equity shares. Accordingly, pursuant to ASC 815, we have classified the fair value of the warrants as a liability to be re-measured at the end of every reporting period with the change in value reported in the statement of operations.

The change in fair value of warrant liability represents the re-measurement of the outstanding warrants at September 30, 2023.

Nine Months ended September 30, 2023 compared to the Nine Months ended September 30, 2022

	Nine-months Ended September 30, 2023	Nine-months Ended September 30, 2022	% Change
Operating expenses			
Research and development	\$ 6,460,747	\$ 823,410	684.63%
General and administrative	1,807,548	1,554,670	16.27%
Total operating expenses	8,268,295	2,378,080	247.69%
Loss from operations	(8,268,295)	(2,378,080)	247.69%
Change in fair value of warrant liability	867,930	-	100.00%
Interest income	1,519	-	100.00%
Net loss	\$ (7,398,846)	\$ (2,378,080)	211.13%

Research and Development

Our research and development costs increased from \$823,410 during the nine months ended September 30, 2022 to \$6,460,747 during the nine months ended September 30, 2023. The increase of \$5,637,337 is primarily due to development activities for our Nell-1 protein as we prepare for our pilot clinical study. We will continue to incur significant expenses for development activities for NELL-1 in the future.

General and Administrative

Our general and administrative expenses increased from \$1,554,670 during the nine months ended September 30, 2022 to \$1,807,548 during the nine months ended September 30, 2023. The \$252,878 increase was due to increased legal expenditures offset by a decrease in the fair value of options issued in 2023 verses 2022.

Change in fair value of warrant liability

In October 2022, we completed a public equity offering, which included the issuance of 54,173 warrants. The warrants provide for a Black Scholes value calculation in the event of certain transactions, which includes a floor on volatility utilized in the value calculation at 100% or greater. We have determined that this provision introduces leverage to the holders of the warrants that could result in a value that would be greater than the settlement amount of a fixed-for-fixed option on the Company’s own equity shares. Accordingly, pursuant to ASC 815, we have classified the fair value of the warrants as a liability to be re-measured at the end of every reporting period with the change in value reported in the statement of operations.

The change in fair value of warrant liability represents the re-measurement of the outstanding warrants at September 30, 2023.

Year ended December 31, 2022 compared to the Year ended December 31, 2021

	Year ended December 31, 2022	Year ended December 31, 2021	% Change
Operating expenses			
Research and development	\$ 1,579,298	\$ 82,044	1824.94%
General and administrative	2,085,875	1,021,032	104.29%
Total operating expenses	3,665,173	1,103,076	232.27%
Loss from operations	(3,665,173)	(1,103,076)	232.27%
Interest expense	-	(805,109)	(100.00)%
Finance cost related to public offering	(731,714)	-	-%
Change in fair value of warrant liability	2,912,267	-	-%
Gain on forgiveness of deferred compensation	-	297,500	(100.00)%
Net loss	\$ (1,484,620)	\$ (1,610,685)	(7.83)%

Research and Development

Our research and development increased from \$82,044 during the year ended December 31, 2021 to \$1,579,298 during the year ended December 31, 2022. We continue to implement research activities after curtailing our operations during 2021. We will continue to incur significant expenses for development activities for NELL-1 in the future.

General and Administrative

Our general and administrative expenses increased from \$1,021,032 during the year ended December 31, 2021 to \$2,085,875 during the year ended December 31, 2022. The \$1,064,843 increase was due to resuming operations in 2022. Significant expenses incurred during 2022 were Directors and Officers insurance, directors' compensation, the revised CFO employment agreement for full-time services and the services of an investor relations firm. We incurred stock based compensation expense for our directors and management team totaling \$266,633.

Interest Expense

Our interest expense decreased from \$805,109 for the year ended December 31, 2021 to \$-0- during the year ended December 31, 2022. All the outstanding convertible notes were converted in October 2021.

Finance cost related to public offering

Finance cost related to public offering of \$731,714 represents the excess of the fair value of the derivative warrant instruments issued on our October 2022 over the net proceeds from the offering.

Change in fair value of warrant liability

In October 2022, we completed a public equity offering, which included the issuance of 54,173 warrants. The warrants provide for a Black Scholes value calculation in the event of certain transactions, which includes a floor on volatility utilized in the value calculation at 100% or greater. We have determined that this provision introduces leverage to the holders of the warrants that could result in a value that would be greater than the settlement amount of a fixed-for-fixed option on the Company's own equity shares. Accordingly, pursuant to ASC 815, we have classified the fair value of the warrants as a liability to be re-measured at the end of every reporting period with the change in value reported in the statement of operations.

The change in fair value of warrant liability represents the re-measurement of the outstanding warrants at December 31, 2022.

Liquidity and Capital Resources

Since inception to September 30, 2023, we have incurred accumulated losses of approximately \$79.4 million. We will continue to incur significant expenses for development activities for its product NELL-1/DBM. Operating expenditures for the next twelve months are estimated at \$5.1 million. The accompanying consolidated financial statements for the nine months ended September 30, 2023 have been prepared assuming the Company will continue as a going concern. As reflected in the financial statements, we incurred a net loss of \$7.4 million, and used net cash in operating activities of \$7.5 million during the nine months ended September 30, 2023. These factors raise substantial doubt about the Company's ability to continue as a going concern within a reasonable period of time, which is considered to be one year from the issuance date of these financial statements. In addition, our independent registered public accounting firm, in its audit report to the financial statements included in this prospectus, expressed substantial doubt about our ability to continue as a going concern. The consolidated financial statements do not include any adjustments related to the recoverability and classification of recorded asset amounts or the amounts and classification of liabilities that might be necessary should the Company be unable to continue as a going concern.

We will continue to attempt to raise additional debt and/or equity financing to fund future operations and to provide additional working capital. However, there is no assurance that such financing will be consummated or obtained in sufficient amounts necessary to meet our needs. If cash resources are insufficient to satisfy our on-going cash requirements, we will be required to scale back or discontinue our product development programs, or obtain funds if available (although there can be no certainties) through strategic alliances that may require us to relinquish rights to our technology or substantially reduce or discontinue our operations entirely. No assurance can be given that any future financing will be available or, if available, that it will be on terms that are satisfactory to us. Even if we are able to obtain additional financing, it may contain undue restrictions on our operations, in the case of debt financing, or cause substantial dilution for our stockholders, in the case of equity financing.

On June 14, 2023, the Company entered into an underwriting agreement (the "Underwriting Agreement") with EF Hutton, division of Benchmark Investments, LLC ("EF Hutton") acting as representatives of the several underwriters in connection with a public offering (the "June Offering") of an aggregate of 317,259 shares of its common stock. The public offering price was \$15.76 per share and the underwriters agreed to purchase 317,259 shares at a 7% discount to the public offering price. The Company granted EF Hutton a 45-day option to purchase up to 47,589 additional shares, to cover over-allotments, if any, which was not exercised. The Offering closed on June 16, 2023, resulting in gross proceeds of \$5 million, before deducting underwriting discounts and commissions and other offering expenses. The net proceeds in relation to the June Offering were \$4,452,163.

At September 30, 2023 and December 31, 2022, we had cash of \$4,452,586 and \$7,538,312, respectively. Available cash is expected to fund our operations through the second quarter of 2024.

On November 20, 2023 we sold and issued, in the Registered Direct Offering, 142,384 shares of common stock, at an offering price of \$5.12 per share to the Purchasers pursuant to the Purchase Agreement. Pursuant to the Purchase Agreement, in a concurrent private placement, we issued to the Purchasers the November Warrants to purchase up to an aggregate of 142,384 shares of common stock, which represent 100% of the shares of common stock issued and sold in the Registered Direct Offering. The November Warrants are exercisable at an exercise price of \$4.16 per share, were exercisable immediately upon issuance, and will expire five and one-half years from the date of issuance. In addition, we issued the placement agent as compensation in connection with the November Offering, the November Placement Agent Warrants to purchase up to an aggregate of 8,543 shares of common stock (equal to 6.0% of the aggregate number of shares sold in the Registered Direct Offering). The November Placement Agent Warrants have substantially the same terms and conditions as the November Warrants, except that the November Placement Agent Warrants have a term of five years from the commencement of sales in the November Offering and an exercise price of \$6.40 per share. The net proceeds of the November Offering were \$591,998.

We anticipate that we will require approximately \$5 million to complete first-in-man studies, and an estimated additional \$24 million in scientific expenses to achieve FDA approval for a spine interbody fusion indication.

Cash Flows

The following is a summary of our cash flows from operating, investing and financing activities for the periods indicated below.

Nine-Month Periods Ended September 30, 2023 and 2022

Operating activities

During the nine months ended September 30, 2023 and 2022, cash used in operating activities was \$7,537,889 and \$1,616,122, respectively. Cash expenditures for the nine months ended September 30, 2023 increased primarily due to development activities for our Nell-1 protein as we prepare for our pilot clinical study.

Financing activities

During the nine months ended September 30, 2023, cash provided by financing activities of \$4,452,163 resulted from the net proceeds of our June 14, 2023 public offering of common stock.

Years ended December 31, 2022 and 2021

Operating activities

During the years ended December 31, 2022 and 2021, cash used in operating activities was \$3,566,913 and \$1,228,586 respectively. Cash expenditures for the year ended December 31, 2022 increased primarily due to implementing research activities after curtailing our operations during 2021, directors' compensation, the revised CFO employment agreement for full-time services and investor relations services.

Financing activities

During the year ended December 31, 2022, cash provided by financing activities of \$4,429,860 resulted from the net proceeds of our October 2022 public offering of common stock units. During the year ended December 31, 2021, cash provided by financing activities of \$7,903,951 resulted primarily from draws on our second and third credit facilities with Hankey Capital and the October 2021 Primary Offering which provided proceeds from sale of common stock units in public offering, net of offering costs of \$6,858,843.

Off-Balance Sheet Arrangements

The Company does not have any off-balance sheet arrangements that have or are reasonably likely to have a current or future effect on the Company's financial condition, changes in financial condition, revenues or expenses, results of operations, liquidity, capital expenditures or capital resources that is material to investors.

Critical Accounting Policies and Use of Estimates

Use of Estimates and Assumptions

The preparation of the accompanying consolidated financial statements in conformity with GAAP requires management to make certain estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the consolidated financial statements and reported amounts of expenses during the reporting period. Significant estimates include the assumptions used in the valuation of stock options and warrants and income tax valuation allowances. Actual results could differ from those estimates.

Research and Development Costs

Research and development costs include, but are not limited to, payroll and other personnel expenses, consultants, expenses incurred under agreements with contract research and manufacturing organizations and animal clinical investigative sites and the cost to manufacture clinical trial materials. Costs related to research, design and development of products are charged to research and development expense as incurred.

Stock Based Compensation

ASC 718, Compensation – Stock Compensation, prescribes accounting and reporting standards for all share-based payment transactions to employees and non-employees. Transactions include incurring liabilities, or issuing or offering to issue shares, options, and other equity instruments such as employee stock ownership plans and stock appreciation rights. Share-based payments to employees, including grants of employee stock options, are recognized as compensation expense in the consolidated financial statements based on their fair values. That expense is recognized over the period during which an employee is required to provide services in exchange for the award, known as the requisite service period (usually the vesting period). Recognition of compensation expense for non-employees is in the same period and manner as if the Company had paid cash for the services.

Recently Issued Accounting Standards

See discussion in Note 2 to the audited consolidated financial statements for the year ended December 31, 2022 included elsewhere in this prospectus.

BUSINESS

Company Overview

We are a medical device company that is currently focused on bone regeneration in spinal fusion using the recombinant human protein known as NELL-1. NELL-1 in combination with DBM, demineralized bone matrix, is an osteopromotive recombinant protein that provides target specific control over bone regeneration. The NELL-1 technology platform has been licensed exclusively for worldwide applications to us through a technology transfer from the UCLA Technology Development Group on behalf of UCLA TDG. UCLA TDG and the Company received guidance from the FDA that NELL-1/DBM will be classified as a device/drug combination product that will require an FDA-approved PMA before it can be commercialized in the United States.

We were founded by University of California professors in collaboration with an Osaka University professor and a University of Southern California surgeon in 2004 as a privately-held company with proprietary, patented technology that has been validated in sheep and non-human primate models to facilitate bone growth. We believe our platform technology has application in delivering improved outcomes in the surgical specialties of spinal, orthopedic, general orthopedic, plastic reconstruction, neurosurgery, interventional radiology, and sports medicine. Lead product development and clinical studies are targeted on spinal fusion surgery, one of the larger segments in the orthopedic market.

We are a development stage entity. The production and marketing of our products and ongoing research and development activities are subject to extensive regulation by numerous governmental authorities in the United States. Prior to marketing in the United States, any combination product developed by us must undergo rigorous preclinical (animal) and clinical (human) testing and an extensive regulatory approval process implemented by the FDA under the Federal Food, Drug, and Cosmetic Act. There can be no assurance that we will not encounter problems in clinical trials that will cause us or the FDA to delay or suspend the clinical trials.

Our success will depend in part on our ability to obtain patents and product license rights, maintain trade secrets, and operate without infringing on the proprietary rights of others, both in the United States and other countries. There can be no assurance that patents issued to or licensed by us will not be challenged, invalidated, rendered unenforceable, or circumvented, or that the rights granted thereunder will provide proprietary protection or competitive advantages to us.

Recent Developments

Amendment to Bylaws

On October 20, 2023, the Board of Directors of the Company approved an amendment to the Company's Bylaws. The amendment to the Bylaws, which became effective immediately, reduces the quorum requirement at all meetings of the Company's stockholders from a majority in voting power of the common stock issued and outstanding and entitled to vote at the meeting to at least one-third in voting power of the common stock issued and outstanding and entitled to vote at the meeting.

November 2023 Offering

On November 20, 2023 the Company sold and issued, in the Registered Direct Offering, 142,384 shares of common stock, at an offering price of \$5.12 per share to the Purchasers pursuant to the Purchase Agreement. Pursuant to the Purchase Agreement, in a concurrent private placement, the Company issued to the Purchasers the November Warrants to purchase up to an aggregate of 142,384 shares of common stock, which represent 100% of the shares of common stock issued and sold in the Registered Direct Offering. The November Warrants are exercisable at an exercise price of \$4.16 per share, were exercisable immediately upon issuance, and will expire five and one-half years from the date of issuance. In addition, the Company issued the placement agent as compensation in connection with the November Offering, the November Placement Agent Warrants to purchase up to an aggregate of 8,543 shares of common stock (equal to 6.0% of the aggregate number of shares sold in the Registered Direct Offering). The November Placement Agent Warrants have substantially the same terms and conditions as the November Warrants, except that the November Placement Agent Warrants have a term of five years from the commencement of sales in the November Offering and an exercise price of \$6.40 per share. The net proceeds of the November Offering were \$591,998.

Nasdaq Panel Decision

On September 27, 2023, the Company received a written notice from the Nasdaq notifying the Company that it was not in compliance with the \$1.00 per share minimum bid price requirement set forth in Nasdaq Listing Rule 5550(a)(2) and that Nasdaq's staff had determined to delist the Company's securities. On December 11, 2023, a Nasdaq Hearings Panel granted the Company's request for continued listing on Nasdaq subject to the Company demonstrating compliance with the minimum bid price requirement prior to January 12, 2024. The Company received notice from Nasdaq on January 9, 2024 that it had regained compliance with the minimum bid price requirement. The Company will remain under a Nasdaq discretionary panel monitor until June 28, 2024.

Reverse Stock Split

On December 12, 2023, we received the approval of the requisite number of holders of the shares of our common stock to amend our certificate of incorporation to effect a reverse split of the shares of our common stock at a ratio of 1-for-5 to 1-for-20 (or any number in between), with the exact ratio to be set within such range in the discretion of our Board of Directors without further approval or authorization of our stockholders. On December 14, 2023, we filed a Certificate of Amendment to our Certificate of Incorporation, with the Secretary of State of the State of Delaware to effect a 1-for-8 reverse stock split of our outstanding common stock. The reverse stock split became effective on December 20, 2023. The conversion or exercise prices of our issued and outstanding stock options and warrants were adjusted accordingly in connection with the reverse stock split.

Director Appointment

On January 8, 2024, the Board of Directors appointed Robert E. Gagnon to the Board of Directors. Erick Lucera resigned from the Board of Directors on December 27, 2023, effective as of the date Mr. Gagnon was appointed.

Product Candidates

We have developed a stand-alone platform technology through significant laboratory and small and large animal research over more than ten years to generate the current applications across broad fields of use. The platform technology is our recombinant human protein, known as NELL-1, a proprietary skeletal specific growth factor which is a bone void filler. NELL-1 provides regulation over skeletal tissue formation and stem cell differentiation during bone regeneration. We obtained the platform technology pursuant to an exclusive license agreement with UCLA TDG which grants us exclusive rights to develop and commercialize NELL-1 for spinal fusion by local administration, osteoporosis and trauma applications. A major challenge associated with orthopedic surgery is effective bone regeneration, including challenges related to rapid, uncontrolled bone growth which can cause unsound structure; cysts and less dense bone formation; unwanted bone formation, and swelling; and intense inflammatory response to current bone regeneration compounds. We believe NELL-1 will address these unmet clinical challenges for effective bone regeneration, especially in hard healers.

We are currently focused on bone regeneration in lumbar spinal fusion, in keeping with our exclusive license agreement, using NELL-1 in combination with DBM, a demineralized bone matrix from MTF. The NELL-1/DBM medical device is a combination product which is an osteopromotive recombinant protein that provides target specific control over bone regeneration. Leveraging the resources of investors and strategic partners, we have successfully surpassed four critical milestones:

- Demonstrating a successful small laboratory scale pilot run for the manufacturing of the recombinant NELL-1 protein in Chinese hamster ovary cells;
- Validation of protein dosing and efficacy in established large animal sheep models pilot study;
- Completed pivotal animal study; and
- Initiated a first-in-human pilot clinical trial in Australia.

Our lead product candidate is expected to be purified NELL-1 mixed with 510(k) cleared DBM Demineralized Bone Putty recommended for use in conjunction with applicable hardware consistent with the indication. The NELL-1/DBM Fusion Device will be comprised of a single dose vial of NELL-1 recombinant protein freeze dried onto DBM. A vial of NELL-1/DBM will be sold in a convenience kit with a diluent and a syringe of 510(k) cleared DBM Putty produced by MTF. A delivery device will allow the surgeon to mix the reconstituted NELL-1 with the appropriate quantity of DBM Putty just prior to implantation.

The NELL-1/DBM Fusion Device is intended for use in lumbar spinal fusion and may have a variety of other spine and orthopedic applications. While the product is initially targeted at the lumbar spine fusion market, in keeping with our exclusive license agreement, we believe NELL-1's novel set of characteristics, target specific mechanism of action, efficacy, safety and affordability position the product well for application in a variety of procedures including:

Spine Implants. Globally a \$3 billion market opportunity, this is the largest market for bone substitute product, representing greater than 70% of the total U.S. market according to Transparency Market Research. While use of the patient's own bone, also referred to as autograft, to enhance fusion of vertebral segments remains the optimal use for this type of treatment, complications associated with use of autograft bone including pain, increased surgical time and infection limit its use.

Non-Union Trauma Cases. While the majority of fractures heal without the need for osteosynthetic products, bone substitutes are used in complicated breaks where the bone does not mend naturally. Globally an \$8 billion market opportunity, management believes that NELL-1 technology is expected to perform as well as other growth factors in this market.

Osteoporosis. Globally an \$11.2 billion market opportunity, the medical need to find a solution to counter a decrease in bone mass and density seen in women most frequently after menopause or a similar effect on astronauts in microgravity environments for an extended period is a major medical challenge. The systemic use of NELL-1 to stimulate bone regeneration throughout the body thereby increasing bone density could have a very significant impact on the treatment of osteoporosis.

UCLA's initial research was funded with approximately \$18 million in resources from UCLA TDG and government grants. Since licensing the exclusive worldwide intellectual property rights from UCLA TDG, our continued development has been funded through capital raises. Our research and development expenses for the years ended December 31, 2022 and 2021 were \$35,623 and \$45,500, respectively. We anticipate that we will require approximately \$5 million to complete first-in-man studies, and an estimated additional \$24 million in scientific expenses to achieve FDA approval for a spine interbody fusion indication. These amounts are estimates based on data currently available to us, and are subject to many factors including the various risk factors discussed below under "Risk Factors."

NELL-1’s powerful specific bone and cartilage forming properties are derived from the ability of NELL-1 to only target cells that exhibit an activated “master switch” to develop into bone or cartilage. NELL-1 is a function specific recombinant human protein that has been proven in laboratory bench models to recapitulate normal human growth and development to provide control over bone and cartilage regeneration.

NELL-1 was isolated in 1996, and the first NELL-1 patent on bone regeneration was filed in 1999. Subsequent patents and continuations in part describing NELL-1 manufacturing, delivery, and cartilage regeneration were filed to further strengthen the patent portfolio.

We have completed two preclinical sheep studies that demonstrated our rhNELL-1 growth factor effectively promotes bone formation in a phylogenetically advanced spine model. In addition, rhNELL-1 was shown to be well tolerated and there were no findings of inflammation. Our pivotal sheep study evaluated the effect of rhNELL-1 combined with DBM on lumbar interbody arthrodesis in an adult ovine model and demonstrated a 37.5% increased frequency of fusion at 26 weeks from the control.

Our first-in-man pilot clinical study commenced year-end 2023 and will evaluate the safety and effectiveness of NB1 in adult subjects with spinal degenerative disc disease at one level from L2-S1, who may also have up to Grade 1 spondylolisthesis or Grade 1 retrolisthesis at the involved level who undergo transforaminal lumbar interbody fusion. The multi-center, prospective, randomized trial consists of 30 patients in Australia, with the primary end-point being fusion success at 12 months and change from baseline in the Oswestry Disability Index pain score. We expect completion of the trial 12 months following enrollment of the 30th patient. We intend to use the pilot clinical trial data from Australia to enable a future larger U.S. pivotal clinical study, prior to submission of a PMA to the FDA.

Research & Publications

We believe our scientific evidence validates the many benefits of NELL-1. Currently there is a comprehensive database of more than 80 research publications and abstracts of preclinical studies with NELL-1 of which more than 45 are peer-reviewed publications.

We completed a preclinical study, which shows our rhNELL-1 growth factor effectively promotes bone formation in a phylogenetically advanced spine model. In addition, rhNELL-1 was shown to be well tolerated and there were no findings of inflammation.

Proposed Initial Clinical Application

The NELL-1/DBM Fusion Device will be indicated for spinal fusion procedures in skeletally mature patients with spinal degenerative disk disease (“DDD”) at one level from L2-S1. These DDD patients may also have up to Grade I spondylolisthesis at the involved level. The NELL-1/DBM Fusion Device is to be implanted via an anterior open or an anterior laparoscopic approach in conjunction with a cleared intervertebral body fusion device. Patients receiving the device should have had at least six months of non-operative treatment prior to treatment with the device. A cervical indication is currently under consideration. This indication for use would fill a current clinical gap, created by potentially dangerous inflammatory responses caused by commercially available catalytic bone growth agents, the subject of a Public Health Notification from the FDA on July 1, 2008 about life threatening complications associated with a recombinant human protein in cervical spine fusion. We do not expect our product to see the same adverse events with NELL-1/DBM as have been observed with other commercially available protein. We have performed a rat femoral onlay model to compare proinflammatory response of rhBMP-2 and NELL-1 within Helistate collagen sponges. While NELL-1 induced normal healing, rhBMP-2 induced significant amounts of swelling and histological evidence of intense inflammatory response.

Description of the DBM Putty to Be Used With Nell-1

The DBM Demineralized Bone Putty provided as part of the convenience kit with NELL-1/DBM is a Class II device. The common name is “Bone Void Filler Containing Human Demineralized Bone Matrix.” The product is regulated under 21 C.F.R. §888.3045 Resorbable calcium salt bone void filler device, Product Codes MQV, GXP, and MBP. MTF is the manufacturer of the DBM Putty that was cleared by the FDA for spine indication in December 2006.

DBM Putty is a matrix composed of processed human cortical bone. Demineralized bone granules are mixed with sodium hyaluronate to form the DBM Putty. Every lot of final DBM Putty product is tested in an athymic mouse model or in an alkaline phosphatase assay, which has been shown to have a positive correlation with the athymic mouse model, to ensure osteostimulation.

Based upon extensive discussions with regulatory experts and a specific communication from the FDA in response to a submission of our plan under the Amended License Agreement between UCLA TDG and the Company, we believe the NELL-1/DBM Fusion Device will be regulated as a Class III medical device and will therefore require submission and approval of a PMA.

Our Business Strategy

Our business plan is to develop our target-specific growth factor for bone regeneration, based on preclinical and clinical data that has demonstrated increases in the quantity and quality of bone, and a strong safety profile. Our initial focus on lumbar spinal fusion entails advancing our target-specific growth factor through clinical studies to achieve FDA approval with comparable efficacy and safety to the gold standard for spine fusion (autografts). Continued capital funding is critical to facilitate the development of our Nell-1 technology through the clinical regulatory path.

Development of the Company

We were incorporated under the laws of the State of Delaware on October 18, 2007 as AFH Acquisition X, Inc. Pursuant to a Merger Agreement, dated September 19, 2014, by and among the Company, its wholly-owned subsidiary, Merger Sub, and Bone Biologics, Inc., Merger Sub merged with and into Bone Biologics Inc., with Bone Biologics Inc. remaining as the surviving corporation in the merger. Upon the consummation of the merger, the separate existence of Merger Sub ceased. On September 22, 2014, the Company officially changed its name to “Bone Biologics Corporation” to more accurately reflect the nature of its business and Bone Biologics, Inc. became a wholly owned subsidiary of the Company. Bone Biologics, Inc. was incorporated in California on September 9, 2004.

Our principal executive offices are located at 2 Burlington Woods Drive, Suite 100, Burlington MA 01803 and our telephone number is (781) 552-4452. Our website address is www.bonebiologics.com. The information contained on our website is not incorporated by reference into this prospectus, and you should not consider any information contained on, or that can be accessed through, our website as part of this prospectus or in deciding whether to invest in our securities.

Effective July 24, 2018, we implemented a reverse split of the outstanding common stock of the Company at a ratio of 1-for-10.

Effective October 12, 2021, we implemented a reverse split of the outstanding common stock of the Company at a ratio of 1-for-2.5.

Effective June 5, 2023, we implemented a reverse split of the outstanding common stock of the Company at a ratio of 1-for-30.

Effective December 20, 2023, we implemented a reverse split of the outstanding common stock of the Company at a ratio of 1-for-8.

UCLA TDG Exclusive License Agreement

Effective April 9, 2019, we entered into the Amended License Agreement with the UCLA TDG. The Amended License Agreement amends and restates the 2017 Agreement. The 2017 Agreement amended and restated the Exclusive License Agreement, effective March 15, 2006, between the Company and UCLA TDG, as amended by ten amendments. Under the terms of the Amended License Agreement, the Regents have continued to grant us exclusive rights to develop and commercialize the Licensed Product for spinal fusion by local administration, osteoporosis and trauma applications. The Licensed Product is a recombinant human protein growth factor that is essential for normal bone development.

We have agreed to pay an annual maintenance fee to UCLA TDG of \$10,000 as well as pay certain royalties to UCLA TDG under the Amended License Agreement at the rate of 3.0% of net sales of licensed products or licensed methods. We must pay the royalties to UCLA TDG on a quarterly basis. Upon a first commercial sale, we also must pay a minimum annual royalty between \$50,000 and \$250,000, depending on the calendar year which is after the first commercial sale. If we are required to pay any third party any royalties as a result of us making use of UCLA TDG patents, then we may reduce the royalty owed to UCLA TDG by 0.333% for every percentage point paid to a third party. If we grant sublicense rights to a third party to use the UCLA TDG patent, then we will pay UCLA TDG 10% to 20% of the sublicensing income we receive from such sublicense.

We are obligated to make the following milestone payments to UCLA TDG for each Licensed Product or Licensed Method:

- \$100,000 upon enrollment of the first subject in a Feasibility Study;
- \$250,000 upon enrollment of the first subject in a Pivotal Study;
- \$500,000 upon Pre-Market Approval of a Licensed Product or Licensed Method; and
- \$1,000,000 upon the First Commercial Sale of a Licensed Product or Licensed Method.

We are also obligated pay to UCLA TDG the Diligence Fee of \$8,000,000 upon the Triggering Sale Date in accordance with the payment schedule below:

- Due upon cumulative Net Sales equaling \$50,000,000 following the Triggering Sale Date - \$2,000,000;
- Due upon cumulative Net Sales equaling \$100,000,000 following the Triggering Sale Date - \$2,000,000; and
- Due upon cumulative Net Sales equaling \$200,000,000 following the Triggering Sale Date - \$4,000,000.

Our obligation to pay the Diligence Fee will survive termination or expiration of the agreement and we are prohibited from assigning, selling, or otherwise transferring any of its assets related to any Licensed Product unless our Diligence Fee obligation is assigned, sold, or transferred along with such assets, or unless we pay UCLA TDG the Diligence Fee within ten (10) days of such assignment, sale or other transfer of such rights to any Licensed Product.

We are also obligated to pay UCLA TDG a cash milestone payment within thirty (30) days of a Liquidity Event (including a Change of Control Transaction and a payment election by UCLA TDG exercisable after December 22, 2016) such payment to equal the greater of:

- \$500,000; or
- 2% of all proceeds in connection with a Change of Control Transaction.

As of September 30, 2023, none of the above milestones have been met.

We are obligated to diligently proceed with developing and commercializing licensed products under UCLA TDG patents set forth in the Amended License Agreement. UCLA TDG has the right to either terminate the license or reduce the license to a non-exclusive license if we do not meet certain diligence milestone deadlines set forth in the Amended License Agreement.

We must reimburse or pre-pay UCLA TDG for patent prosecution and maintenance costs incurred during the term of the Amended License Agreement. We have the right to bring infringement actions against third party infringers of the Amended License Agreement, UCLA TDG may join voluntarily, at its own expense, or, at our expense, be joined involuntarily to the action. We are required to indemnify UCLA TDG against any third party claims arising out of our exercise of the rights under the Amended License Agreement or any sublicense.

Competition

The orthobiologic and orthopedic industries are characterized by rapidly advancing technologies, intense competition and a strong emphasis on intellectual property. We face substantial competition from many different sources, including large and specialty orthopedic companies, biotechnology companies, academic research institutions and governmental agencies along with public and private research institutions.

Our business is in a very competitive and evolving field, that faces competition from large established orthopedic companies such as (but not limited to) Medtronic, Stryker, Zimmer-Biomet, and DePuy-Synthes that possess considerably more resources than Bone Biologics.

Our commercial opportunity could be reduced if our competitors develop and commercialize products that are safer, more effective, have fewer or less severe side effects, are more convenient or are less expensive than any products that we may develop. Our competitors also may obtain FDA or other regulatory approval for their products more rapidly than we may obtain approval for ours, which could result in our competitors establishing a strong market position before we are able to enter the market.

The NELL-1 growth factor is mechanistically distinct from bone morphogenetic proteins (“BMPs”) and can minimize complications associated with BMP therapies. The early proof of concept animal studies has shown the efficacy of NELL-1 combined with demineralized bone matrix as a novel bone graft material for interbody spine fusion.

Customers

The populations of interest include spine surgeons, and patients with a skeletal bone defect or bone-related condition in their spine, for which intervention is undertaken to correct such a defect. Spine surgeons and patients can choose to eliminate the need to perform a second painful surgery to obtain autograft harvest of hip bone for fusion procedures by utilizing various other types of biologics.

Most cases of lower back pain can be linked to a general cause such as muscle strain, injury, overuse, or can be attributed to a specific condition like herniated disc, degenerative disc disease, spondylolisthesis, spinal stenosis, or osteoarthritis.

Intellectual Property

We have an intellectual property portfolio that includes exclusive, worldwide licenses from UCLA TDG which we believe constitute a formidable barrier to entry.

Additional patent applications are currently in preparation. The intellectual property portfolio comprehensively covers NELL-1 manufacture, NELL-1 compositions and NELL-1 use in wide ranging clinical and diagnostic applications. We protect our proprietary technology through mechanisms including U.S. and foreign patent filings, trade secret protections, and collaboration agreements with domestic and international corporations, universities and research institutions. We are the exclusive licensee for the following nine (9) UCLA TDG issued patents:

U.S. Patent No.	Summary	Date Issued
7544486	NELL-1 Peptide Expression Systems	6/9/2009
7691607	Expression system of NELL-1 peptide	4/6/2010
7807787	NELL-1 Peptide	10/5/2010
7833968	Pharmaceutical compositions for treating or preventing bone conditions	11/16/2010
9447155	Isoform NELL-1 peptide	9/20/2016
9511115	Pharmaceutical compositions for treating or preventing bone conditions	12/6/2016
9598480	Recombinant NEL-like (NELL) protein production	3/21/2017
9974828	Isoform NELL-1 peptide	5/22/2018
10335458	Pharmaceutical compositions for treating or preventing bone conditions	7/2/2019

Government Regulation

The manufacturing and marketing of any product which we may formulate with our technologies as well as our related research and development activities are subject to regulation for safety, efficacy and quality by governmental authorities in the U.S. and other countries. We anticipate that these regulations will apply separately to each product. We believe that complying with these regulations will involve a considerable level of time, expense and uncertainty.

In the U.S., devices are subject to rigorous federal regulation and, to a lesser extent, state regulation. The Federal Food, Drug, and Cosmetic Act, as amended, and the regulations promulgated thereunder, and other federal and state statutes and regulations govern, among other things, the testing, manufacture, safety, efficacy, labeling, storage, record keeping, approval, advertising and promotion of our products. Device development and approval within this regulatory framework is difficult to predict, requires a number of years and involves the expenditure of substantial resources. Moreover, ongoing legislation by U.S. Congress and rule making by the FDA presents an ever-changing landscape where we could be required to undertake additional activities before any governmental approval is granted allowing us to market our products. The steps required before a biological device may be marketed in the U.S. include:

- Laboratory and non-clinical tests for safety and small scale manufacturing of the agent;
- The submission to the FDA of an IDE which must become effective before human clinical trials can commence;
- Clinical trials to characterize the efficacy and safety of the product in the intended patient population;
- The submission of a PMA to the FDA; and
- FDA approval of the NDA or PMA prior to any commercial sale or shipment of the product.

In addition to obtaining FDA approval for each product, each manufacturing establishment must be registered with, and approved by, the FDA. Moreover, manufacturing establishments are subject to biennial inspections by the FDA and must comply with the FDA’s current Good Manufacturing Practice “cGMP” for products, drugs and devices.

Non-clinical Trials

Non-clinical testing includes laboratory evaluation of chemistry and formulation as well as tissue culture and animal studies to assess the safety and potential efficacy of the product. Non-clinical safety tests must be conducted by laboratories that comply with FDA regulations regarding good laboratory practices. Non-clinical testing is inherently risky and the results can be unpredictable or difficult to interpret. The results of non-clinical testing are submitted to the FDA as part of an IDE and are reviewed by the FDA prior to the commencement of clinical trials. Unless the FDA objects to an IDE, clinical studies may begin 30 days after the IDE is submitted. We have relied and intend to continue to rely on third-party contractors to perform non-clinical trials.

Clinical Trials

Our first-in-man pilot clinical study commenced year-end 2023 and will evaluate the safety and effectiveness of NB1 in adult subjects with DDD at one level from L2-S1, who may also have up to Grade 1 spondylolisthesis or Grade 1 retrolisthesis at the involved level who undergo transforaminal lumbar interbody fusion. The multi-center, prospective, randomized trial will consist of 30 patients in Australia, with the primary end-point being fusion success at 12 months and change from baseline in the Oswestry Disability Index pain score.

Our clinical, and regulatory strategy involves a well-established pathway to success. We intend to use the pilot clinical study data from Australia to enable our larger U.S. pivotal clinical study, prior to submission of a PMA to the FDA.

Clinical trials involve the administration of the investigational product to healthy volunteers or to patients under the supervision of a qualified investigator. Clinical trials must be conducted in accordance with good clinical practices under protocols that detail the objectives of the study, the parameters to be used to monitor safety and the efficacy criteria to be evaluated. Each protocol must be submitted to the FDA prior to its conduct. Further, each clinical study must be conducted under the auspices of an independent institutional review board. The institutional review board will consider, among other things, ethical factors, the safety of human subjects and the possible liability of the institution. The drug product used in clinical trials must be manufactured according to the FDA's current Good Manufacturing Practices.

Clinical trials under IDE regulations are typically conducted in two sequential trials. In the Pilot trial, the initial introduction of the product into healthy human subjects, the drug is tested for safety (adverse side effects), absorption, metabolism, bio-distribution, excretion, food and drug interactions, abuse as well as limited measures of pharmacologic effect and proof of principle that involves studies in a limited patient population in order to:

- assess the potential efficacy of the product for specific, targeted indications;
- demonstrate efficacy in a limited patient population;
- identify the range of doses likely to be effective for the indication; and
- identify possible adverse events and safety risks.

When there is evidence that the product may be effective and has an acceptable safety profile in pilot evaluations, pivotal trials are undertaken to establish and confirm the clinical efficacy and establish the safety profile of the product within a larger population at geographically dispersed clinical study sites. Pivotal trials frequently involve randomized controlled trials and, whenever possible, studies are conducted in a manner so that neither the patient nor the investigator knows what treatment is being administered. The Company, the IRB or the FDA, may suspend clinical trials at any time if it is believed that the individuals participating in such trials are being exposed to unacceptable health risks. We intend to rely upon third-party contractors to advise and assist us in the preparation of our IDEs and the conduct of clinical trials that will be conducted under the IDEs.

Premarket Approval and FDA Approval Process

The results of the manufacturing process, development work, non-clinical studies and clinical studies are submitted to the FDA in the form of a PMA prior to marketing and selling the product. The testing and approval process is likely to require substantial time and effort. In addition to the results of non-clinical and clinical testing, the PMA applicant must submit detailed information about chemistry, manufacturing and controls that will describe how the product is made and tested through the manufacturing process.

The PMA review process involves FDA investigation into the details of the manufacturing process, as well as the design and analysis of each of the non-clinical and clinical studies. This review includes inspection of the manufacturing facility, the data recording process for the clinical studies, the record keeping at a sample of clinical trial sites and a thorough review of the data collected and analyzed for each non-clinical and clinical study. Through this investigation, the FDA reaches a decision about the risk-benefit profile of a product candidate. If the benefit is worth the risk, the FDA begins negotiating with the company about the content of an acceptable package insert and associated Risk Evaluation and Mitigation Strategies, if required.

The approval process is affected by a number of factors, including the severity of the disease, the availability of alternative treatments and the risks and benefits demonstrated in clinical trials. Consequently, there is a risk that approval may not be granted on a timely basis, if at all. The FDA may deny a PMA if applicable regulatory criteria are not satisfied, require additional testing or information or require post-marketing testing (Phase 4) and surveillance to monitor the safety of a company's product if it does not believe the PMA contains adequate evidence of the safety and efficacy of the product. Moreover, if regulatory approval of a product is granted, such approval may entail limitations on the indicated uses for which it may be marketed. Finally, product approvals may be withdrawn if compliance with regulatory standards is not maintained or health problems are identified that would alter the risk-benefit analysis for the product. Post-approval studies may be conducted to explore the use of the product for new indications or populations such as pediatrics.

Among the conditions for PMA approval is the requirement that any prospective manufacturer's quality control and manufacturing procedures conform to the FDA's Good Manufacturing Practices and the specifications approved in the PMA. In complying with standards set forth in these regulations, manufacturers must continue to expend time, money and effort in the area of product and quality control to ensure full technical compliance. Manufacturing establishments, both foreign and domestic, also are subject to inspections by or under the authority of the FDA and by other federal, state or local agencies. Additionally, in the event of non-compliance, FDA may issue warning letters and/or seek criminal and civil penalties, enjoin manufacture, seize product or revoke approval.

International Approval

Whether or not FDA approval has been obtained, approval of a product by regulatory authorities in foreign countries must be obtained prior to the commencement of commercial sales of the medical product in such countries. The requirements governing the conduct of clinical trials and product approvals vary widely from country to country, and the time required for approval may be longer or shorter than that required for FDA approval. Although there are some procedures for unified filings for certain European countries, in general, each country at this time has its own procedures and requirements.

Other Regulation

In addition to regulations enforced by the FDA, we are also subject to U.S. regulation under the Controlled Substances Act, the Occupational Safety and Health Act, the Environmental Protection Act, the Toxic Substances Control Act, the Resource Conservation and Recovery Act and other present and potential future federal, state, local or similar foreign regulations. Our research and development may involve the controlled use of hazardous materials, chemicals and radioactive compounds. Although we believe that its safety procedures for handling and disposing of such materials comply with the standards prescribed by state and federal regulations, the risk of accidental contamination or injury from these materials cannot be completely eliminated. In the event of any accident, we could be held liable for any damages that result and any such liability could exceed our resources.

Employees and Human Capital

As of the date hereof, we have two full-time employees, Jeffery Frelick and Deina Walsh. See “Management” below for biographies of Mr. Frelick and Ms. Walsh. We have relied and plan on continuing to rely on independent organizations, advisors and consultants to perform certain services for us, including handling substantially all aspects of regulatory approval, clinical management, manufacturing, marketing, and sales. Such services may not always be available to us on a timely basis or at costs that we can afford. Our future performance will depend in part on our ability to successfully integrate newly hired officers and to engage and retain consultants, as well as our ability to develop an effective working relationship with our management and consultants.

We also have engaged and plan to continue to engage regulatory consultants to advise us on our dealings with the FDA and other foreign regulatory authorities and have been and will be required to retain additional consultants and employees. Our future performance will depend in part on our ability to successfully integrate newly hired officers into our management team and our ability to develop an effective working relationship among senior management. Losing key personnel or failing to recruit necessary additional personnel would impede our ability to attain our development objectives.

Properties

We lease our primary office which is located at 2 Burlington Woods Drive, Ste 100, Burlington, MA 01803 on a month to month lease.

Legal Proceedings

In July 2019, Dr. Bessie (Chia) Soo and Dr. Kang (Eric) Ting (“Plaintiffs”) filed a complaint (the “Complaint”) in the United States District Court for the District of Massachusetts against the Company, Bruce Stroever (“Stroever”), John Booth (“Booth”), Stephen LaNeve (“LaNeve”, and together with Stroever and Booth, the “Individual Defendants”), and MTF Biologics (f/k/a The Musculoskeletal Transplant Foundation, Inc.) (“MTF”). The Complaint alleged claims for breach of contract against the Company and tortious interference with contract against the Individual Defendants and MTF arising from the termination of the Professional Service Agreements, dated as of January 8, 2016, between the Company and each of the Plaintiffs. The Individual Defendants were sued for actions taken by them in connection with their service to the Company as directors and/or officers of the Company. As such, the Company has certain indemnification obligations to the Individual Defendants.

On January 10, 2024 we entered into a Settlement Agreement and Mutual General Release (the “Agreement”) with the Plaintiffs, and the Company and LaNeve on the other hand, in settlement of the claims for breach of contract and tortious interference. The Agreement is effective as of January 9, 2024. Under the Agreement, we will pay the plaintiffs \$750,000 in cash within 20 business days after the date the Agreement was executed. Our insurance carrier’s portion of the claim is \$400,000 less certain retention amounts. The parties to the Agreement have filed a joint stipulation to dismiss the action with prejudice with the Court and we expect the action to be dismissed by the Court.

In the normal course of our business, we may periodically become subject to various lawsuits. However, except as noted above, there are currently no legal actions pending against us or, to our knowledge, are any such proceedings contemplated.

**MARKET FOR REGISTRANT’S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER
PURCHASES OF EQUITY SECURITIES**

Market

Our common stock and warrants trade on The Nasdaq Capital Market under the symbols “BBLG” and “BBLGW,” respectively.

Holders

As of January 23, 2024, we had 22 stockholders of record holding 534,238 shares of our common stock outstanding, including 523,200 shares of common stock held by an indeterminate number of beneficial owners of securities whose shares are held in the names of various depository accounts, brokerage firms and clearing agencies.

Dividends

We have never declared or paid cash dividends on our common stock, and we do not anticipate paying any cash dividends on our common stock in the foreseeable future. We intend to retain all available funds and future earnings, if any, to fund the development and expansion of our business. Any future determination to pay dividends on the common stock will be at the discretion of our Board of Directors and will depend upon a number of factors, including our results of operations, financial condition, future prospects, contractual restrictions, restrictions imposed by applicable law and other factors our Board of Directors deems relevant.

MANAGEMENT

The following table and biographical summaries set forth information, including principal occupation and business experience, about our directors and executive officers as of the date of this prospectus.

Name	Age	Position
Jeffrey Frelick	58	Chief Executive Officer and President
Deina H. Walsh	59	Chief Financial Officer
Don Hankey	80	Chairman of the Board of Directors
Bruce Stroevers	74	Director
Siddhesh Angle	39	Director
Robert Gagnon	49	Director

Jeffrey Frelick: Chief Executive Officer and President

Jeffrey Frelick serves as our President and Chief Executive Officer, bringing more than 25 years of leadership, operational, and investment experience in the life science industry. He joined Bone Biologics in 2015 as our Chief Operating Officer and assumed his current role in June 2019. Prior to Bone Biologics, Mr. Frelick spent 15 years on Wall Street as a sell-side analyst following the med-tech industry at investment banks Canaccord Genuity, ThinkEquity and Lazard. He also previously worked at Boston Biomedical Consultants where he provided strategic planning assistance, market research data and due diligence for diagnostic companies. He began his career at Becton Dickinson in sales and sales management positions after gaining technical experience as a laboratory technologist with Clinical Pathology Facility. Mr. Frelick received a B.S. in Biology from University of Pittsburgh and an M.B.A. from Suffolk University’s Sawyer Business School.

Deina H. Walsh: Chief Financial Officer

Deina Walsh has served as our Chief Financial Officer since November 2014. She is a certified public accountant and owner/founder of DHW CPA, PLLC, a Public Company Accounting Oversight Board (PCAOB) registered firm since 2014. Prior to forming her firm, Ms. Walsh spent 13 years at a public accounting firm where as a partner she was actively responsible for leading firm audit engagements of publicly held entities in accordance with PCAOB standards and compliance with SEC regulations, including internal control requirements under Section 404 of the Sarbanes-Oxley Act. Ms. Walsh had a global client base including entities throughout the United States, Canada and China. These entities encompass a diverse range of industries including manufacturing, wholesale, life sciences, pharmaceuticals, and technology. Her experience includes work with start-up companies and well-established operating entities. She has assisted many entities seeking debt and equity capital. Areas of specialty include mergers, acquisitions, reverse mergers, consolidations, complex equity structures, foreign currency translations and revenue recognition complexities. Ms. Walsh has an Associates of Science Degree in Business Administration from Monroe Community College and a Bachelor of Science Degree in Accounting from the State University of New York at Brockport.

Don Hankey: Chairman of the Board of Directors

Mr. Hankey has served as Chairman of the Board since 2018. Mr. Hankey holds his BA Degree and has done post-graduate work from the University of Southern California. At age 27, Mr. Hankey became Vice President of a major investment banking firm, which would later become part of USB Paine Weber. Mr. Hankey acquired Midway Ford in 1972 and founded Hankey Investment Company. During the 1980s, Mr. Hankey’s organization grew its portfolio and established a foothold in the financial services industry. Mr. Hankey has incorporated technology into every aspect of the Hankey Group of companies improving efficiencies and outcomes. Mr. Hankey has been the manager of Hankey Capital, LLC, since its formation in 2002. Given Mr. Hankey’s financial experience, we believe he is well qualified to serve as the Chairman of the Board.

Bruce Stroevers: Director

Mr. Stroevers has served on the Board since 2012, bringing forty years of product development and general management experience in the medical device and orthobiologics fields. Mr. Stroevers most recently served as President and Chief Executive Officer at MTF until he retired in 2018 after 30 years of service. Under Mr. Stroevers’s leadership, MTF grew to be the largest tissue bank in the world. From 1971 to 1988, Mr. Stroevers held several positions with Ethicon, Inc., a Johnson & Johnson, Inc. subsidiary. Mr. Stroevers served on the advisory board for the New Jersey Organ and Tissue Sharing Network. He was also elected to the Board of Governors of the American Association of Tissue Banks for a three-year term in 1999 and subsequently in 2012. He was a founding member of the Tissue Policy Group subsidiary of the AATB and served as its Chairman for two terms. Mr. Stroevers serves on the Board of Donate Life New York State, a non-profit based in Albany, New York. Mr. Stroevers received his B.E. in Mechanical/Chemical Engineering from Stevens Institute of Technology in 1972 and a M.S. in Bioengineering from Columbia University in 1977. Given Mr. Stroevers’s educational background, his senior management experience in our industry and the continuity he brings to the Board, we believe that Mr. Stroevers is well qualified to serve as a member of the Board.

Siddhesh (Sid) R. Angle: Director

Dr. Angle’s appointment to the Board became effective upon completion of October 2021 Offering. From 2018 to the present, Dr. Angle is Co-Founder, President and Chief Executive Officer of Regenosine, an early stage start-up for osteoarthritic disease. From 2021 to present, Dr. Angle also serves on the Executive Team of Vetosine, an animal health affiliate of Regenosine. From 2020 to 2021, Dr. Angle was Associate Director, Innovation Commercialization at NYU Langone. From 2017 to 2020, Dr. Angle was Program Manager, Innovation Commercialization at NYU Langone. From 2013 to 2017, Dr. Angle worked in various R&D capacities at Zimmer Biomet, culminating as R&D manager of global orthobiologics. From 2011 to 2013, Dr. Angle served as Research Scientist at Carnegie Mellon University. Given Mr. Angle’s extensive background in research and development, we believe that Mr. Angle is well qualified to serve as a member of the Board.

Robert Gagnon: Director

Mr. Gagnon’s appointment to the Board became effective on January 8, 2024. Mr. Gagnon has served as the Chief Financial Officer of Remix Therapeutics, a biotechnology company, since March 2023. Prior to Remix Therapeutics, Mr. Gagnon served as Chief Financial Officer and Operating Partner at Gurnet Point Capital, a healthcare venture capital and private equity fund, from October 2022 to June 2023. Earlier, he served as Chief Financial Officer of Verastem, Inc. from August 2018 to October 2022 in addition to serving as Chief Business Officer from June 2019 to October 2022. Prior to Verastem, Mr. Gagnon served as the Chief Financial Officer for Harvard Bioscience, Inc. from November 2013 to August 2018. From 2012 through 2013, Mr. Gagnon served as the Executive Vice President, Chief Financial Officer and Treasurer at Clean Harbors, Inc. Mr. Gagnon’s prior experience includes serving as Chief Accounting Officer and Controller at Biogen Idec, Inc., as well as a variety of senior positions at Deloitte & Touche, LLP, and PriceWaterhouseCoopers, LLP. Mr. Gagnon holds an M.B.A. from the MIT Sloan School of Management and a B.A. in accounting from Bentley College. Mr. Gagnon currently serves as on the board of directors at Verastem and Purple Biotech Ltd. Given Mr. Gagnon’s significant financial, accounting and management expertise, as well as his experience within the pharmaceutical and biotechnology industries, we believe that Mr. Gagnon is well qualified to serve as a member of the Board.

Family Relationships

There are no family relationships between any of our directors or executive officers.

CORPORATE GOVERNANCE

Our Board consists of four members: Don Hankey, Sid Angle, Robert Gagnon and Bruce Stroeve.

Director Independence

The listing standards of The Nasdaq Stock Market LLC require that a majority of our Board of Directors be independent. No director will qualify as independent unless the board affirmatively determines that the director has no relationship with us that would interfere with the exercise of independent judgment in carrying out the responsibilities of a director. Based upon the Nasdaq listing standards and applicable SEC rules and regulations, our board has determined that each of Sid Angle, Robert Gagnon and Bruce Stroeve and are independent and that Erick Lucera, who resigned from our board effective January 8, 2024, was independent during his service on the Board of Directors.

Board Leadership Structure and Role in Risk Oversight

The Board believes it is important to select the Company’s Chairman and Chief Executive Officer in the manner it considers in the best interests of the Company at any given time. The Board has elected a Chairman of the Board who is different from the Company’s Chief Executive Officer.

The Board currently includes three individuals who are independent from the management of the Company. The Board and its committees meet regularly throughout the year to assure that the independent directors are well briefed and informed with regard to the Company’s affairs. Independent directors have unfettered access to any employee within the Company and are encouraged to call upon whatever employee he deems fit to secure the information each director feels is important to their understanding of our Company. In this fashion, we seek to maintain well informed, independent directors who are prepared to make informed decisions regarding our business affairs.

Management is responsible for the day-to-day management of risks the Company faces, while the Board as a whole plays an important role in overseeing the identification, assessment and mitigation of such risks. The Board reviews information regarding the Company’s finances and operations, as well as the risks associated with each. For example, the oversight of financial risk management lies primarily with the Board’s Audit Committee, which is empowered to appoint and oversee our independent auditors, monitor the integrity of our financial reporting processes and systems of internal controls and provide an avenue of communication among our independent auditors, management and the Board. The Company’s Compensation Committee is responsible for overseeing the management of risks relating to the Company’s compensation plans and arrangements. In fulfilling its risk oversight responsibility, the Board, as a whole and acting through any established committees, regularly consults with management to evaluate and, when appropriate, modify our risk management strategies.

Board Committees

Our Board has appointed a standing audit committee, nominating and corporate governance committee, and compensation committee. Each committee acts pursuant to a written charter adopted by our Board of Directors. The current charters for each board committee are available on our website, www.bonebiologics.com under the heading, “Investors” and the subheading, “Corporate Governance.” The information contained on our website is not a part of this prospectus.

Audit Committee

The Audit Committee is responsible for overseeing: (i) our accounting and reporting practices and compliance with legal and regulatory requirements regarding such accounting and reporting practices; (ii) the quality and integrity of our financial statements; (iii) our internal control and compliance programs; (iv) our independent auditors’ qualifications and independence and (v) the performance of our independent auditors. In so doing, the Audit Committee maintains free and open means of communication between our directors and management. The Board of Directors has determined that each member of the Audit Committee, consisting of Bruce Stroeve, Robert E. Gagnon (Chair), and Sid Angle, meets the independence and financial literacy requirements applicable to audit committee members under the Nasdaq listing standards and SEC rules. The Board of Directors has further determined that Mr. Gagnon qualifies as an “audit committee financial expert” in accordance with the applicable rules and regulations of the SEC.

Compensation Committee

The Compensation Committee is responsible for reviewing and approving the compensation of our executive officers and directors and our performance plans and other compensation plans. The Compensation Committee makes recommendations to our Board in connection with such compensation and performance plans. The Board has determined that each member of the Compensation Committee, consisting of Bruce Stroeve (Chair), Robert E. Gagnon, and Sid Angle, meets the independence requirements applicable to compensation committee members under the Nasdaq listing standards.

Nominating and Corporate Governance Committee

The Nominating and Corporate Governance Committee is responsible for (i) identifying, screening and reviewing individuals qualified to serve as directors (consistent with criteria approved by our Board) and recommending to our Board candidates for nomination for election at the annual meeting of stockholders or to fill Board vacancies or newly created directorships; (ii) developing and recommending to our Board and overseeing the implementation of our corporate governance guidelines (if any); (iii) overseeing evaluations of our Board and (iv) recommending to our Board candidates for appointment to Board committees. The Board has determined that each member of the Nominating and Corporate Governance Committee, consisting of Bruce Stroeve, Robert E. Gagnon, and Sid Angle (Chair), meets the independence requirements applicable to nominating committee members under the Nasdaq listing standards.

Indemnification Agreements

Our Board has approved and we have entered into an indemnification agreement with each of our directors and executive officers (“Indemnification Agreement”). The Indemnification Agreement provides for indemnification against expenses, judgments, fines and penalties actually and reasonably incurred by an indemnitee in connection with threatened, pending or completed actions, suits or other proceedings, subject to certain limitations. The Indemnification Agreement also provides for the advancement of expenses in connection with a proceeding prior to a final, non-appealable judgment or other adjudication, provided that the indemnitee provides an undertaking to repay to us any amounts advanced if the indemnitee is ultimately found not to be entitled to indemnification by us. The Indemnification Agreement sets forth procedures for making and responding to a request for indemnification or advancement of expenses, as well as dispute resolution procedures that will apply to any dispute between us and an indemnitee arising under the Indemnification Agreement.

Code of Conduct and Ethics

The Company adopted a formal code of ethics within the meaning of Item 406 of Regulation S-K promulgated under the Securities Act that applies to our principal executive officer, principal financial officer, principal accounting officer or controller, or persons performing similar functions and that establishes, among other things, procedures for handling actual or apparent conflicts of interest. Our Code of Conduct and Ethics is available at our website www.bonebiologics.com/investor-relation.

Anti-Hedging Policy

We have an insider trading policy that prohibits directors, officers and employees from engaging in transactions that hedge or offset any decrease in the market value of equity securities granted as compensation.

EXECUTIVE AND DIRECTOR COMPENSATION

Summary Compensation Table

The table below summarizes the compensation earned for services rendered to us in all capacities, for the fiscal years indicated, by named executive officers:

Name and Principal Position	Year	Salary (\$)	Option awards \$(1)	Non-equity incentive plan compensation \$(2)	Total (\$)
Jeffrey Frelick, Chief Executive Officer and President	2023	\$ 300,000	\$ 51,600	\$ 25,000	\$ 376,600
	2022	\$ 300,000	\$ 76,965	\$ 37,750	\$ 414,715
Deina Walsh, Chief Financial Officer	2023	\$ 200,000	\$ 25,800	\$ 12,500	\$ 238,300
	2022	\$ 200,000	\$ 31,583	\$ 18,875	\$ 250,458

(1) The amounts shown in this column represent the grant date fair value of performance-based option awards earned during the applicable fiscal year under our executive compensation program, calculated in accordance with Financial Accounting Standards Board Accounting Standards Codification (“ASC”) 718, “Compensation – Stock Compensation,” or ASC 718. The assumptions used in calculating the grant date fair value of the option awards for 2022 are set forth in Note 6 of the financial statements for the nine months ended September 30, 2023 included with this prospectus. The assumptions used in calculating the grant date fair value of the option awards for 2023 are as follows:

Risk free interest rate	4.80%
Expected Volatility	154.91%
Expected life (in years)	1.00
Expected dividend yield	0%

The expected volatility is a measure of the amount by which our stock price is expected to fluctuate during the expected term of options granted. We determine the expected volatility based upon the historical volatility of our common stock since listing on The Nasdaq Capital Market. We do not believe that the future volatility of our common stock over an option’s expected term is likely to differ significantly from the past. The risk-free interest rate used in the calculations is based on the implied yield available on U.S. Treasury issues with an equivalent term approximating the expected life of the options as calculated using the simplified method. The expected life of the options used was based on the contractual life of the option granted. Stock-based compensation is a non-cash expense because we settle these obligations by issuing shares of our common stock from our authorized shares instead of settling such obligations with cash payments.

(2) The amounts shown in this column reflect performance-based cash awards earned during the applicable fiscal year under our executive compensation program.

Annual Performance-Based Awards

The Company has an annual performance-based cash award program for our executive officers, which is designed to reinforce the Company’s goals and strategic initiatives, and reward our executive officers for meeting objective performance goals for a fiscal year. The annual performance-based awards are determined by the achievement of Company and individual performance metrics established at the beginning of each fiscal year by the compensation committee and our Board of Directors. For each of the fiscal years ended December 31, 2023 and 2022, annual bonuses were based on achievement of Company goals related to clinical development objectives, business development goals, capital raising and certain investor goals. The target award opportunity under the annual performance-based award program for each of the fiscal years ended December 31, 2023 and 2022 as a percentage of base salary was 50% for Mr. Frelick and 25% for Ms. Walsh.

Following the compensation committee’s review of the achievement of corporate and individual performance for fiscal year ended December 31, 2023 the compensation committee awarded Mr. Frelick \$25,000 in cash and options to purchase 25,000 shares of common stock and Ms. Walsh \$12,500 in cash and options to purchase 12,500 shares of common stock, respectively. For fiscal year ended December 31, 2022, Mr. Frelick was awarded \$37,750 in cash and options to purchase 158 shares of common stock and Ms. Walsh was awarded \$18,875 in cash and options to purchase 79 shares of common stock, respectively.

Employment Agreements with Consultants and Named Executive Officers

Jeffrey Frelick – Chief Executive Officer and President

The Company entered into an Employment Agreement, dated as of June 8, 2015, with Jeffrey Frelick, to serve as the Company's Chief Operating Officer, effective August 8, 2015, with an annual salary of \$300,000. Effective June 28, 2019, the Board appointed Mr. Frelick as the Chief Executive Officer and President. Pursuant to Mr. Frelick's employment agreement he received a stock option grant equal to 3% of the then outstanding shares of common stock on August 8, 2015, to vest in three equal installments on the first, second, and third anniversary of the execution of the employment agreement, which expire on December 27, 2025. Mr. Frelick's employment agreement is for a term of three years with the initial term ended on August 7, 2018, after which the employment agreement automatically extends for one-year periods until terminated by the Company or Mr. Frelick.

Pursuant to Mr. Frelick's employment agreement he is eligible to earn an annual target bonus of 50% of his base salary as in-effect for the applicable calendar year, subject to the achievement of personal and corporate objectives or milestones to be established by the Board or the compensation committee (after considering any input or recommendations from Mr. Frelick) within 60 days of the beginning of each calendar year during Mr. Frelick's employment. In order to earn the annual bonus under this provision, the applicable objectives must be achieved and Mr. Frelick must be employed by Company at the time the annual bonus is distributed by Company. The annual bonus, if any, shall be paid on or before March 15th of the calendar year following the year in which it is considered earned. The actual annual bonus paid may be more or less than 50% of Mr. Frelick's base salary. In the event of Mr. Frelick's termination without cause, Mr. Frelick is entitled to receive any unpaid salary and expenses, a payment equal to 12 months of his base salary, a pro-rated annual bonus at the Board's discretion, and a continuation of benefits for 12 months. To allow Mr. Frelick to prevent or mitigate dilution of his equity interests in the Company, in connection with each financing, Mr. Frelick will be provided an opportunity to invest in the Company such that his interest, at his option, remains undiluted or partially diluted.

Deina Walsh – Chief Financial Officer

The Company entered into an Independent Contractor Agreement, dated as of June 28, 2019, with Deina Walsh, whereby she provided services to the Company at a rate of \$100.00 per hour. On December 17, 2021, the Company entered into an employment agreement with Ms. Walsh, effective January 3, 2022, to serve as the Company's full time Chief Financial Officer with an annual salary of \$200,000. Pursuant to her employment agreement, Ms. Walsh received a vested stock option grant entitling her to purchase 833 shares of common stock, which expires on January 3, 2025. Ms. Walsh's employment agreement has an indeterminate term and is at will.

Pursuant to Ms. Walsh's employment agreement she is eligible to earn an annual target bonus of 25% of her base salary as in-effect for the applicable calendar year, subject to the achievement of personal and corporate objectives or milestones to be established by the Board, or any compensation committee thereof, (after considering any input or recommendations from Ms. Walsh) within 60 days following the beginning of each calendar year during Ms. Walsh's employment. In order to earn the annual bonus under this provision, the applicable objectives must be achieved and Ms. Walsh must be employed by Company at the time the annual bonus is distributed by Company. The annual bonus, if any, shall be paid on or before March 15th of the calendar year following the year in which it is considered earned. The actual annual bonus paid may be more or less than 25% of Ms. Walsh's base salary. In the event of Ms. Walsh's termination without cause, Ms. Walsh is entitled to receive any unpaid salary and expenses, a payment equal to 4 months of her base salary, a pro-rated annual bonus at the Boards discretion, and a continuation of benefits for 4 months. To allow Ms. Walsh to prevent or mitigate dilution of her equity interests in the Company, in connection with each financing, Ms. Walsh shall be provided an opportunity to invest in the Company such that her interest, at her option, remains undiluted or partially diluted.

Stock Options

On January 17, 2024, Mr. Frelick received a stock option grant whereby he is entitled to purchase 25,000 shares of common stock at an exercise price of \$3.61. The stock options vested immediately and expire on January 17, 2026. In the event Mr. Frelick is terminated prior to January 17, 2026, any unexercised portion of this this stock option grant will be forfeited unless such termination is without Cause, as defined in the 2015 Equity Incentive Plan, in which case the vested and unexercised options will not be forfeited until the earlier of three months from such termination or January 17, 2026.

On January 17, 2024, Ms. Walsh received a stock option grant whereby she is entitled to purchase 12,500 shares of common stock at an exercise price of \$3.61. The stock options vested immediately and expire on January 17, 2026. In the event Ms. Walsh is terminated prior to January 17, 2026, any unexercised portion of this this stock option grant will be forfeited unless such termination is without Cause, as defined in the 2015 Equity Incentive Plan, in which case the vested and unexercised options will not be forfeited until the earlier of three months from such termination or January 17, 2026.

On January 25, 2023, Mr. Frelick received a stock option grant whereby he is entitled to purchase 158 shares of common stock at an exercise price of \$57.60. The stock options vested immediately and expire on January 25, 2025. In the event Mr. Frelick is terminated prior to January 25, 2025, any unexercised portion of this this stock option grant will be forfeited unless such termination is without Cause, as defined in the 2015 Equity Incentive Plan, in which case the vested and unexercised options will not be forfeited until the earlier of three months from such termination or January 25, 2025.

On January 25, 2023, Ms. Walsh received a stock option grant whereby she is entitled to purchase 79 shares of common stock at an exercise price of \$57.60. The stock options vested immediately and expire on January 25, 2025. In the event Ms. Walsh is terminated prior to January 25, 2025, any unexercised portion of this this stock option grant will be forfeited unless such termination is without Cause, as defined in the 2015 Equity Incentive Plan, in which case the vested and unexercised options will not be forfeited until the earlier of three months from such termination or January 25, 2025.

Our compensation committee believes the compensation under the employment agreements and other incentives granted to our named executive officers align our named executive officers’ interests with those of our stockholders. Our compensation committee and Board continues to evaluate our executive compensation program with a view toward motivating our named executive officers to meet our strategic operational and financial goals in the best interests of our stockholders.

Outstanding Equity Awards at Fiscal Year-End

Name	Number of securities underlying unexercised options (#) exercisable	Option exercise price (\$)	Option expiration date
Jeffrey Frelick, Chief Operating Officer	158	\$ 57.60	January 25, 2025
	209	\$ 892.80	January 1, 2024
	45	\$ 12,300.00	May 26, 2026
Deina Walsh, Chief Financial Officer	79	\$ 57.60	January 25, 2025
	174	\$ 9,540.00	December 27, 2025
	105	\$ 892.80	January 3, 2024

Director Compensation

The following table shows information regarding the compensation earned during the year ended December 31, 2023 by the members of our Board.

Name	Fees earned or paid in cash	Option awards ⁽¹⁾	Total
Bruce Stroevers	\$ 30,000	\$ 46,883	\$ 76,883
Don Hankey ⁽²⁾	-	-	-
Erick Lucera ⁽³⁾	\$ 30,000	\$ 46,883	\$ 76,883
Sid Angle	\$ 30,000	\$ 46,883	\$ 76,883

(1) The amounts in this column reflect the aggregate grant date fair value of stock options under FASB ASC Topic 718. The assumptions used in calculating the grant date fair value of the option awards for 2023 are set forth in Note 6 of the financial statements for the nine months ended September 30, 2023 included with this prospectus. The following table provides information regarding equity awards held by each independent non-employee director as of December 31, 2023:

Name	Stock Options Outstanding (#)
Bruce Stroevers	10,925
Don Hankey	-
Erick Lucera	11,009
Sid Angle	11,009

(2) Non-independent director. No compensation paid per our Non-Employee Director Compensation Policy.
(3) Resigned effective January 8, 2024.

The Board adopted a Non-Employee Director Compensation Policy (the “Director Compensation Policy”) as follows:

Annual Cash Compensation

Each Non-Employee Director will receive the cash compensation set forth below for service on the Board. The annual cash compensation amounts will be payable in equal quarterly installments, in arrears following the end of each quarter in which the service occurred, pro-rated for any partial months of service. All annual cash fees are vested upon payment.

- 1. Annual Board Service Retainer:
 - a. All Non-Employee Directors other than the Board Chair: \$25,000
 - b. Non-Employee Director who is the Board Chair: \$35,000
- 2. Annual Committee Chair Service Retainer (in addition to Annual Board Service Retainer):
 - a. Chairman of the Audit Committee: \$5,000
 - b. Chairman of the Compensation Committee: \$5,000
 - c. Chairman of the Corporate Governance Committee: \$5,000

Equity Compensation

Equity awards will be granted under the 2015 Equity Incentive Plan. All stock options granted under this Director Compensation Policy will be Nonstatutory Stock Options (as defined in the Plan), with a term of ten years from the date of grant and an exercise price per share equal to 100% of the Fair Market Value (as defined in the Plan) of the underlying common stock of the Company on the date of grant.

- (a) Automatic Equity Grants.

(i) **Initial Grant for New Directors.** Without any further action of the Board, each person who, after the effective date of the Non-Employee Director Compensation Policy, is elected or appointed for the first time to be a Non-Employee Director will automatically, upon the date of his or her initial election or appointment to be a Non-Employee Director, be granted a Nonstatutory Stock Option to purchase 9 shares of Common stock (the “Initial Grant”), regardless of when such person is elected or appointed to the Board. Each Initial Grant will fully vest on the date of the annual meeting of the stockholders of the Company (“Annual Meeting”) next following the Initial Grant.

(ii) **Annual Grant.** Without any further action of the Board, at the close of business on the date of each Annual Meeting following the effective date of the Non-Employee Director Compensation Policy, each person who is then a Non-Employee Director will automatically be granted to a Nonstatutory Stock Option to purchase a number of shares of common stock having an option value (calculated on the date of grant) of \$50,000 (the “Annual Grant”). Each Annual Grant will vest in a series of four successive equal quarterly installments over the one-year period measure from the date of grant.

(iii) **Pro-rated Annual Grant.** If a person is elected or appointed to the Board at a time other than at the annual stockholder meeting, then on the date of such election or appointment, the person will be automatically, and without further action by the Board, granted an Annual Grant covering a pro-rated number of shares of Common Stock pursuant to the Non-Employee Director Compensation Policy.

CERTAIN RELATIONSHIPS AND RELATED PARTY TRANSACTIONS

The following is a description of transactions since January 1, 2021 to which we have been a participant in which the amount involved exceeded or will exceed the lesser of (i) \$120,000 and (ii) one percent of the average of our total assets at year-end for the last two completed fiscal years in which any of our directors, executive officers or holders of more than 5% of our voting securities, or any members of their immediate family, had or will have a direct or indirect material interest, other than compensation arrangements.

Hankey Capital held certain convertible notes of the Company as discussed below. Don Hankey, the CEO and Chairman of Hankey Group, is our non-independent Chairman of the Board and a significant stockholder. Bret Hankey, the president of Hankey Capital, was a non-independent board member through October 13, 2021. The Hankey Group is an affiliate of Hankey Capital.

Prior to January 1, 2019, the Company issued three convertible promissory notes in the aggregate amount of \$9,000,000 to Hankey Capital. The convertible notes were to mature on December 31, 2021 and bear interest at an annual rate of interest of the “prime rate” plus 4.0%, with a minimum rate of 8.5% per annum until maturity, with interest payable monthly in arrears. Prior to the maturity date, Hankey Capital had a right, in its sole discretion, to convert the convertible notes into shares of our common stock, at a conversion rate equal to \$1.00 per share. The notes were secured by 31,915 collateral shares.

The Company and Hankey Capital also entered into agreements under which Hankey Capital provided credit facilities in an aggregate amount of \$3,800,000 to the Company to be drawn down by the Company upon notice to Hankey Capital. The credit facility was evidenced by a convertible secured note convertible prior to the maturity date at \$1.00 per share. The draws bore interest at an annual rate of interest at the “prime rate” (as quoted in the “Money Rates” section of The Wall Street Journal) plus 4.0%, with a minimum rate of 8.5% per annum until maturity, with interest payable monthly in arrears. The notes were secured by 7,092 collateral shares.

In connection with the Company’s October 2021 primary offering, Hankey Capital converted all the outstanding convertible notes and advances under the secured credit facilities (\$12,767,894 in principal amount and \$2,054,041 of accrued interest) into shares of our common stock. In addition, 39,007 collateral shares were returned to the Company and cancelled.

Review, Approval or Ratification of Transactions with Related Persons

Due to the small size of our Company, we do not at this time have a formal written policy regarding the review of related party transactions, and rely on our full Board to review, approve or ratify such transactions and identify and prevent conflicts of interest. Our Board reviews any such transaction in light of the particular affiliation and interest of any involved director, officer or other employee or stockholder and, if applicable, any such person’s affiliates or immediate family members. Management aims to present transactions to our Board for approval before they are entered into or, if that is not possible, for ratification after the transaction has occurred. If our Board finds that a conflict of interest exists, then it will determine the appropriate action or remedial action, if any. Our Board approves or ratifies a transaction if it determines that the transaction is consistent with our best interests and the best interest of our stockholders.

SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT

The following table sets forth information, as of January 23, 2024, regarding the beneficial ownership of our common stock by:

- each person known by us to be a beneficial owner of more than five percent of our outstanding common stock;
- each of our directors and director nominee;
- each of our named executive officers; and
- all directors and executive officers as a group.

The amounts and percentage of common stock beneficially owned are reported on the basis of regulations of the SEC governing the determination of beneficial ownership of securities. Under the rules of the SEC, a person is deemed to be a “beneficial owner” of a security if that person has or shares “voting power,” which includes the power to vote or to direct the voting of such security, or “investment power,” which includes the power to dispose of or to direct the disposition of such security. A person is also deemed to be a beneficial owner of any securities of which that person has a right to acquire beneficial ownership within 60 days. Under these rules, more than one person may be deemed a beneficial owner of the same securities and a person may be deemed a beneficial owner of securities as to which he has no economic interest. Except as indicated by footnote, the persons named in the table below have sole voting and investment power with respect to all shares of common stock shown as beneficially owned by them.

Name of Beneficial Owner or Identity of Group	Shares ⁽¹⁾	Percentage
5% or greater stockholders:		
Executive Officers and Directors ⁽²⁾ :		
Don R. Hankey	29,776 ⁽³⁾	5.6%
Jeffrey Frelick	27,528 ⁽⁴⁾	4.9%
Sid Angle	5,649 ⁽⁵⁾	1.0%
Bruce Stroeve	5,564 ⁽⁶⁾	1.0%
Deina H. Walsh	14,454 ⁽⁷⁾	2.6%
Robert E. Gagnon	4,003 ⁽⁸⁾	*
Total Officers and Directors as a Group (6 persons)	86,974 ⁽⁹⁾	14.8%

* Represents beneficial ownership of less than 1% of our outstanding common stock.

- (1) Based on 534,238 outstanding shares. The number of shares issued and outstanding that was used to calculate the percentage ownership of each listed person includes the shares underlying convertible debt, stock options and warrants that are exercisable within 60 days from our report date.
- (2) Except as indicated by footnote, the address for our executive officers and directors is 2 Burlington Woods Drive, Ste 100, Burlington, MA 01803.
- (3) Mr. Hankey is the beneficial owner of 27,931 shares and 1,845 shares issuable upon exercise of warrants of the Company consisting of 17,833 shares and 1,170 shares issuable upon exercise of warrants owned by the Don Hankey Trust (the “Trust”) of which Mr. Hankey is the Trustee, 133 shares held by H&H Funding LLC of which Mr. Hankey is the sole manager, 325 shares and 22 shares issuable upon exercise of warrants held by Knight Services, Inc. which is 100% owned by the Trust, and 9,640 shares and 653 shares issuable upon exercise of warrants of which Knight Insurance Company, Ltd. is the beneficial owner consisting of 6,112 shares and 414 shares issuable upon exercise of warrants held by Knight Insurance Company, Ltd., 1,190 shares and 81 shares issuable upon exercise of warrants held by Knightbrook Insurance Company which is a wholly owned subsidiary of Knight Insurance Company, Ltd. and 2,338 shares and 158 shares issuable upon exercise of warrants held by Knight Specialty Insurance Company a wholly owned subsidiary of Knight Insurance Company, Ltd. The address for Mr. Hankey is 4751 Wilshire Blvd #110, Los Angeles, CA 90010.
- (4) Includes 25,377 shares underlying stock options exercisable within 60 days.
- (5) Includes 5,649 shares underlying stock options exercisable within 60 days.
- (6) Includes 5,564 shares underlying stock options exercisable within 60 days.
- (7) Includes 12,579 shares underlying stock options exercisable within 60 days.
- (8) Includes 4,003 shares underlying stock options exercisable within 60 days.
- (9) Consists of 31,957 shares, 1,845 shares issuable upon exercise of warrants and 53,172 shares underlying stock options exercisable within 60 days.

DESCRIPTION OF SECURITIES

The following description of our capital stock and provisions of our Certificate of Incorporation and Bylaws is only a summary. You should also refer to our Certificate of Incorporation, a copy of which is filed as an exhibit to the registration statement of which this prospectus is a part, and our Bylaws, a copy of which is filed as an exhibit to the registration statement of which this prospectus is a part.

General

Our Amended and Restated Certificate of Incorporation, as amended (“Certificate of Incorporation”), authorizes the issuance of up to 100,000,000 shares of common stock, par value \$0.001 per share, and up to 20,000,000 shares of preferred stock, par value \$0.001 per share. As of January 23, 2024, there were 534,238 shares of common stock outstanding, which were held by approximately 22 stockholders of record, and no shares of preferred stock outstanding.

On December 20, 2023, we effected a reverse stock split of our common stock at a ratio of 1-for-8. Unless otherwise noted, the share and per share information in this prospectus reflects the effect of the reverse stock split.

Common Stock

Each holder of common stock is entitled to one vote for each share held on all matters submitted to a vote of stockholders and do not have cumulative voting rights. An election of directors by our stockholders will be determined by a plurality of the votes cast by the stockholders entitled to vote on the election. All other actions by stockholders will be approved by the majority of the votes cast affirmatively or negatively (excluding abstentions and broker non-votes) except as otherwise required by law.

Holders of common stock are entitled to receive proportionately any dividends that may be declared by our Board of Directors, subject to any preferential dividend rights of any series of preferred stock that we may designate and issue. In the event of our liquidation or dissolution, the holders of common stock are entitled to receive proportionately our net assets available for distribution to stockholders after the payment of all debts and other liabilities and subject to the preferential rights of any outstanding preferred stock.

Holders of our common stock have no preemptive, subscription, redemption, or conversion rights. The rights, preferences, and privileges of holders of common stock are subject to and may be adversely affected by the rights of the holders of shares of any series of preferred stock that we may designate and issue.

Preferred Stock

Under our Certificate of Incorporation, our Board of Directors has the authority, without further action by stockholders, to designate one or more series of preferred stock and to fix the voting powers, designations, preferences, limitations, restrictions, and relative rights granted to or imposed upon the preferred stock, including dividend rights, conversion rights, voting rights, rights and terms of redemption, liquidation preference, and sinking fund terms, any or all of which may be preferential to or greater than the rights of the common stock.

The authority possessed by our Board of Directors to issue preferred stock could potentially be used to discourage attempts by third parties to obtain control of our company through a merger, tender offer, proxy contest, or otherwise by making such attempts more difficult or more costly. Our Board of Directors may issue preferred stock with voting rights, conversion rights, and other rights that, if exercised, could adversely affect the voting power of the holders of common stock.

Warrants

The following summary of certain terms and provisions of the warrants that are being offered hereby is not complete and is subject to, and qualified in its entirety by, the provisions of warrants, the forms of which are filed as exhibits to the registration statement of which this prospectus forms a part. Prospective investors should carefully review the terms and provisions of the forms of warrant for a complete description of the terms and conditions of the warrants.

Duration and Exercise Price. The warrants will have an assumed exercise price of \$ per share (100% of the combined public offering price per share of common stock and accompanying warrant) and will be exercisable upon issuance (the “Initial Exercise Date”). The warrants will expire on the five-year anniversary of the Initial Exercise Date. The exercise price and number of shares of common stock issuable upon exercise of the warrants is subject to appropriate adjustment in the event of stock dividends, stock splits, reorganizations or similar events affecting our common stock and the exercise price. The warrants will be issued separately from the common stock and pre-funded warrants and may be transferred separately immediately thereafter. The warrants will be issued in certificated form only.

Exercise Limitation. The warrants will be exercisable, at the option of each holder, in whole or in part, by delivering to us a duly executed exercise notice accompanied by payment in full for the number of shares of our common stock purchased upon such exercise (except in the case of a cashless exercise as discussed below). A holder (together with its affiliates) may not exercise any portion of such holder’s warrants to the extent that the holder would own more than 4.99% of the outstanding common stock immediately after exercise, except that upon at least 61 days’ prior notice from the holder to us, the holder may increase the amount of ownership of outstanding stock after exercising the holder’s warrants up to 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 the warrants..

Cashless Exercise. If, at the time a holder exercises its warrants, a registration statement registering the issuance or resale of the shares of common stock underlying the warrants under the Securities Act is not then effective or available for the issuance of such shares, then in lieu of making the cash payment otherwise contemplated to be made to us upon such exercise in payment of the aggregate exercise price, the holder may elect instead to receive upon such exercise (either in whole or in part) the net number of shares of common stock determined according to a formula set forth in the warrant.

Fractional Shares. No fractional shares of common stock will be issued upon the exercise of the warrants. Rather, the number of shares of common stock to be issued will, at our election, either be rounded up to the next whole share or we will pay a cash adjustment in respect of such final fraction in an amount equal to such fraction multiplied by the exercise price.

Transferability. Subject to applicable laws, a warrant may be transferred at the option of the holder upon surrender of the warrant to us together with the appropriate instruments of transfer.

Trading Market. There is no established trading market for the warrants, and we do not expect such a market to develop. We do not intend to apply to list the warrants on any securities exchange or other nationally recognized trading system. Without an active trading market, the liquidity of the warrants will be extremely limited.

Fundamental Transactions. In the event of a fundamental transaction, as described in the warrants and generally including any reorganization, recapitalization or reclassification of our shares of common stock, the sale, transfer or other disposition of all or substantially all of our properties or assets, our consolidation or merger with or into another person, the acquisition of 50% or more of the voting power represented by our outstanding shares of capital stock, any person or group becoming the beneficial owner of 50% or more of the voting power represented by our outstanding shares of capital stock, any merger with or into another entity or a tender offer or exchange offer approved by more than 50% of the voting power represented by our outstanding shares of capital, then upon any subsequent exercise of a warrant, the holder will have the right to receive as alternative consideration, for each share of our common stock that would have been issuable upon such exercise immediately prior to the occurrence of such fundamental transaction, the number of shares of common stock of the successor or acquiring corporation or of our company, if it is the surviving corporation, and any additional consideration receivable upon or as a result of such transaction by a holder of the number of shares of our common stock for which the warrant is exercisable immediately prior to such event. Notwithstanding the foregoing, in the event of a fundamental transaction, the holders of the warrants have the right to require us or a successor entity to redeem the warrants for cash in the amount of the Black-Scholes Value (as defined in each warrant) of the unexercised portion of the 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 our Board, the holders of the warrants will only be entitled to receive from us or our 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 warrant that is being offered and paid to the holders of our 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.

Right as a Stockholder. Except as otherwise provided in the warrants or by virtue of such holder's ownership of shares of our common stock, the holders of the warrants do not have the rights or privileges of holders of our common stock, including any voting rights, until they exercise their warrants.

Pre-Funded Warrants

The following summary of certain terms and provisions of the pre-funded warrants that are being offered hereby is not complete and is subject to, and qualified in its entirety by, the provisions of the pre-funded warrant, the form of which will be filed as an exhibit to the registration statement of which this prospectus forms a part. Prospective investors should carefully review the terms and provisions of the form of pre-funded warrant for a complete description of the terms and conditions of the pre-funded warrants.

Duration and Exercise Price. Each pre-funded warrant offered hereby will have an initial exercise price per share of common stock equal to \$0.001. The pre-funded warrants will be immediately exercisable and may be exercised at any time until all of the pre-funded warrants are exercised in full. The exercise price and number of shares of common stock issuable upon exercise is subject to appropriate adjustment in the event of share dividends, share splits, reorganizations or similar events affecting our shares of common stock and the exercise price.

Exercise Limitation. The pre-funded warrants will be exercisable, at the option of each holder, in whole or in part, by delivering to us a duly executed exercise notice accompanied by payment in full for the number of shares of common stock purchased upon such exercise (except in the case of a cashless exercise as discussed below). A holder (together with its affiliates) may not exercise any portion of the pre-funded warrant to the extent that the holder would own more than 4.99% of the outstanding shares of common stock immediately after exercise, except that upon at least 61 days' prior notice from the holder to us, the holder may increase the amount of beneficial ownership of outstanding shares after exercising the holder's pre-funded warrants up to 9.99% of the number of our shares of common stock outstanding immediately after giving effect to the exercise, as such percentage ownership is determined in accordance with the terms of the pre-funded warrants. Purchasers of pre-funded warrants in this offering may also elect prior to the issuance of the pre-funded warrants to have the initial exercise limitation set at 9.99% of our outstanding shares of common stock.

Cashless Exercise. In lieu of making the cash payment otherwise contemplated to be made to us upon such exercise in payment of the aggregate exercise price, the holder may elect instead to receive upon such exercise (either in whole or in part) the net number of shares of common stock determined according to a formula set forth in the pre-funded warrants.

Fractional Shares. No fractional shares of common stock will be issued upon the exercise of the pre-funded warrants. Rather, at the Company’s election, the number of shares of common stock to be issued will be rounded up to the next whole share or the Company will pay a cash adjustment in an amount equal to such fraction multiplied by the exercise price.

Transferability. Subject to applicable laws, a pre-funded warrant may be transferred at the option of the holder upon surrender of the pre-funded warrants to us together with the appropriate instruments of transfer.

Trading Market. There is no established trading market for the pre-funded warrants, and we do not expect such a market to develop. We do not intend to apply to list the pre-funded warrants on any securities exchange or other nationally recognized trading system. Without an active trading market, the liquidity of the pre-funded warrants will be extremely limited.

Fundamental Transaction. In the event of a fundamental transaction, as described in the pre-funded warrants and generally including any reorganization, recapitalization or reclassification of our shares of common stock, the sale, transfer or other disposition of all or substantially all of our properties or assets, our consolidation or merger with or into another person, the acquisition of 50% or more of the voting power represented by our outstanding shares of capital stock, any person or group becoming the beneficial owner of 50% or more of the voting power represented by our outstanding shares of capital stock, any merger with or into another entity or a tender offer or exchange offer approved by more than 50% of the voting power represented by our outstanding shares of capital, then upon any subsequent exercise of a pre-funded warrant, the holder will have the right to receive as alternative consideration, for each share of our common stock that would have been issuable upon such exercise immediately prior to the occurrence of such fundamental transaction, the number of shares of common stock of the successor or acquiring corporation or of our company, if it is the surviving corporation, and any additional consideration receivable upon or as a result of such transaction by a holder of the number of shares of our common stock for which the pre-funded warrant is exercisable immediately prior to such event.

Right as a Stockholder. Except as otherwise provided in the pre-funded warrants or by virtue of such holder’s ownership of shares of common stock, the holders of the pre-funded warrants do not have the rights or privileges of holders of our shares of common stock, including any voting rights, until they exercise their pre-funded warrants. The pre-funded warrants will provide that the holders of the pre-funded warrants have the right to participate in distributions or dividends paid on our shares of common stock.

Placement Agent Warrants

We have also agreed to issue to the placement agent or its designees as compensation in connection with this offering, the placement agent warrants to purchase up to shares of common stock at an assumed exercise price of \$ per share (representing 125% of the offering price per share and accompanying warrant). The placement agent warrants will expire five years from the commencement of sales in this offering. Except as provided above, the placement agent warrants will have substantially the same terms as the warrants described herein. See “Plan of Distribution–Placement Agent Warrants.”

Anti-Takeover Effects of Our Certificate of Incorporation and Bylaws

Certain provisions of our Certificate of Incorporation and Bylaws contain provisions that could have the effect of delaying 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.

Our Certificate of Incorporation and Bylaws include provisions that:

- authorize our Board of Directors to issue, without further action by the stockholders, up to 20,000,000 shares of preferred stock in one or more series designated by the Board of Directors;
- specify that meetings of our stockholders can be called only by our Board of Directors, or any officer instructed by the director to call the meeting; and
- provide that vacancies on our Board of Directors may be filled only by the vote of a majority of the remaining directors even though less than a quorum.

Our Bylaws also provide that stockholders seeking to bring business before our annual meeting of stockholders, or to nominate candidates for election as directors at our annual meeting of stockholders, must provide timely notice of their intent in writing. To be timely, a stockholder’s notice must be delivered to the secretary at our principal executive offices 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 first anniversary of the preceding year’s annual meeting; provided, however, that in the event the date of the annual meeting is more than 30 days before or more than 60 days after such anniversary date, or if no annual meeting was held in the preceding year, notice by the stockholder to be timely must be so delivered not earlier than the close of business on the 120th day prior to such annual meeting and not later than the close of business on the later of the 90th day prior to such annual meeting or the 10th day following the day on which a public announcement of the date of such meeting is first made by us. 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.

Delaware Anti-Takeover Statute

We are subject to the provisions of Section 203 of the Delaware General Corporation Law (“DGCL”) regulating corporate takeovers. In general, Section 203 prohibits a publicly-held Delaware corporation such as Bone Biologics Corp. from engaging in a “business combination” with an “interested stockholder” for a period of three years following the date the person became an interested stockholder unless:

- prior to the date of the transaction, the Board of Directors of the corporation approved either the business combination or the transaction which resulted in the stockholder becoming an interested stockholder;
- upon completion 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, but not for determining the outstanding voting stock owned by the interested stockholder, (1) shares owned by persons who are directors and also officers of the corporation and (2) shares owned by employee stock plans in which employee participants do not have the right to determine confidentially whether shares held subject to the plan will be tendered in a tender or exchange offer; or
- at or subsequent to the date of the transaction, the business combination is approved by the Board of Directors of the corporation and authorized at an annual or special meeting of stockholders, and not by written consent, by the affirmative vote of at least 66–2/3% of the outstanding voting stock which is not owned by the interested stockholder.

In this context, a “business combination” includes a merger, asset or stock sale, or other transaction resulting in a financial benefit to the interested stockholder. An “interested stockholder” is a person who, together with affiliates and associates, owns or, within three years prior to the determination of interested stockholder status, did own 15% or more of a corporation’s outstanding voting stock. We expect the existence of this provision to have an anti-takeover effect with respect to transactions our Board of Directors does not approve in advance. We also anticipate that Section 203 may discourage business combinations or other attempts that might result in a premium over the market price for the shares of common stock held by our stockholders.

Transfer Agent and Registrar

The transfer agent and registrar for our common stock is Equiniti Trust Company, LLC.

Stock Market Listing

Our common stock is listed on Nasdaq under the symbol “BBLG.”

PLAN OF DISTRIBUTION

Pursuant to an engagement agreement, dated _____, 2024, we have engaged _____, or the placement agent, to act as our exclusive placement agent to solicit offers to purchase the securities offered pursuant to this prospectus on a best efforts basis. The engagement agreement does not give rise to any commitment by the placement agent to purchase any of our securities, and the placement agent will have no authority to bind us by virtue of the engagement agreement. The placement agent is not purchasing or selling any of the securities offered by us under this prospectus, nor is it required to arrange for the purchase or sale of any specific number or dollar amount of securities. This is a best efforts offering and there is no minimum offering amount required as a condition to the closing of this offering. The placement agent has agreed to use reasonable best efforts to arrange for the sale of the securities by us. Therefore, we may not sell all of the shares of common stock, pre-funded warrants and warrants being offered. The terms of this offering are subject to market conditions and negotiations between us, the placement agent and prospective investors. The placement agent does not guarantee that it will be able to raise new capital in any prospective offering. The placement agent may engage sub-agents or selected dealers to assist with the offering.

Investors purchasing securities offered hereby will have the option to execute a securities purchase agreement with us. In addition to rights and remedies available to all purchasers in this offering under federal securities and state law, the purchasers which enter into a securities purchase agreement will also be able to bring claims of breach of contract against us. The ability to pursue a claim for breach of contract provides those investors with the means to enforce the covenants uniquely available to them under the securities purchase agreement including: (i) timely delivery of shares; (ii) agreement to not enter into variable rate financings for _____ from closing, subject to certain exceptions; (iii) agreement to not enter into any financings for _____ days from closing; and (iv) indemnification for breach of contract.. The nature of the representations, warranties and covenants in the securities purchase agreements shall include:

- standard issuer representations and warranties on matters such as organization, qualification, authorization, no conflict, no governmental filings required, current in SEC filings, no litigation, labor or other compliance issues, environmental, intellectual property and title matters and compliance with various laws such as the Foreign Corrupt Practices Act; and
- covenants regarding matters such as registration of warrant shares, no integration with other offerings, no stockholder rights plans, no material nonpublic information, use of proceeds, indemnification of purchasers, reservation and listing of shares of common stock, and no subsequent equity sales for _____ days.

We will deliver the securities being issued to the investors upon receipt of investor funds for the purchase of the securities offered pursuant to this prospectus. We expect to deliver the securities being offered pursuant to this prospectus on or about _____, 2024. There is no minimum number of securities or amount of proceeds that is a condition to closing of this offering.

Fees and Expenses

We have agreed to pay the placement agent a total cash fee equal to 7.0% of the aggregate gross proceeds raised in the offering. We have also agreed to pay the placement agent a management fee of 1.0% of the aggregate gross proceeds raised in this offering and to reimburse the placement agent a nonaccountable expense allowance of \$35,000, its legal fees and expenses in an amount up to \$100,000 and its clearing expense in an amount up to \$15,950 in connection with this offering. We estimate the total offering expenses of this offering that will be payable by us, excluding the placement agent fees and expenses, will be approximately \$183,587.60.

Placement Agent Warrants

In addition, we have agreed to issue to the placement agent or its designees warrants, or the placement agent warrants, to purchase up to 6.0% of the aggregate number of shares of common stock sold in this offering (including shares underlying any pre-funded warrants), at an exercise price equal to 125% of the public offering price per share and accompanying warrant to be sold in this offering. The placement agent warrants will be exercisable upon issuance and will expire five years from the commencement of sales under this offering.

If at the time of exercise there is no effective registration statement registering, or the prospectus contained therein is not available for the resale of warrant shares by the holders of the placement agent warrants, then the placement agent warrants may be exercised, in whole or in part, at such time by means of a “cashless exercise” in which the holders shall be entitled to receive a number of warrant shares as calculated in the placement agent warrants.

The placement agent warrants provide for customary anti-dilution provisions (for share dividends, splits and recapitalizations and the like) consistent with FINRA Rule 5110.

Tail

In the event that any investors that contacted by the placement agent during the term of our engagement agreement with the placement agent provide any capital to us in a public or private offering or capital-raising transaction within twelve (12) months following the termination or expiration of our engagement agreement with the placement agent, we shall pay the placement agent the cash and warrant compensation provided above on the gross proceeds from such investors. The placement agent will only be entitled to such fee to the extent that the parties are directly introduced to us by the placement agent, in accordance with FINRA Rule 2010.

Right of First Refusal

From the date of the engagement agreement until the 12-month anniversary following consummation of each offering of our securities during the term of the engagement agreement, we or any of our subsidiaries (a) engage in certain transactions, including but not limited to, disposition or acquisition of outstanding securities, tender offers, mergers, consolidations or other business combinations as set forth in the engagement letter, the placement agent (or any affiliate designated by the placement agent) shall have the right to act as the Company's exclusive financial advisor for any such transaction, (b) decides to finance or refinance any indebtedness, the placement agent (or any affiliates designated by the placement agent), shall have the right to act as sole book-runner, sole manager, sole placement agent or sole agent with respect to such financing or refinancing or (c) decides to raise funds by means of a public offering (excluding an at-the-market facility) or a private placement or any other capital-raising financing of equity, equity-linked or debt securities, the placement agent (or any affiliate designated by the placement agent) shall have the right to act as sole book-running manager, sole underwriter or sole placement agent for such financing.

Lock-Up Agreements

Our officers and directors have agreed with the placement agent to be subject to a lock-up period of _____ days following the closing of this offering. This means that, during the applicable lock-up period, such persons may not offer for sale, contract to sell, sell, distribute, grant any option, right or warrant to purchase, pledge, hypothecate or otherwise dispose of, directly or indirectly, any shares of our common stock or any securities convertible into, or exercisable or exchangeable for, shares of our common stock. Certain limited transfers are permitted during the lock-up period if the transferee agrees to these lock-up restrictions. We have also agreed to similar lock-up restrictions on the issuance and sale of our securities for _____ days following the closing of this offering, subject to certain exceptions. The placement agent may, in its sole discretion and without notice, waive the terms of any of these lock-up agreements.

In addition, subject to certain exceptions, we have agreed to not issue any securities that are subject to a price reset based on the trading prices of our common stock or upon a specified or contingent event in the future, or enter into any agreement to issue securities at a future determined price for a period of one year following the closing date of this offering.

Indemnification

We have agreed to indemnify the placement agent against certain liabilities, including certain liabilities under the Securities Act, or to contribute to payments that the placement agent may be required to make in respect of those liabilities.

In addition, we will indemnify the purchasers of securities in this offering against liabilities arising out of or relating to (i) any breach of any of the representations, warranties, covenants or agreements made by us in the securities purchase agreement or related documents or (ii) any action instituted against a purchaser by a third party (other than a third party who is affiliated with such purchaser) with respect to the securities purchase agreement or related documents and the transactions contemplated thereby, subject to certain exceptions

Regulation M Compliance

The placement agent may be deemed to be an underwriter within the meaning of Section 2(a)(11) of the Securities Act, and any fees received by it and any profit realized on the sale of our securities offered hereby by it while acting as principal might be deemed to be underwriting discounts or commissions under the Securities Act. The placement agent will be required to comply with the requirements of the Securities Act and the Exchange Act, including, without limitation, Rule 10b-5 and Regulation M under the Exchange Act. These rules and regulations may limit the timing of purchases and sales of our securities by the placement agent. Under these rules and regulations, the placement agent may not (i) engage in any stabilization activity in connection with our securities; and (ii) bid for or purchase any of our securities or attempt to induce any person to purchase any of our securities, other than as permitted under the Exchange Act, until they have completed their participation in the distribution.

Other Relationships

The placement agent and its affiliates have engaged, and may in the future engage, in investment banking transactions and other commercial dealings in the ordinary course of business with us or our affiliates. The placement agent has received, or may in the future receive, customary fees and commissions for these transactions.

In addition, in the ordinary course of their business activities, the placement agent and its affiliates may make or hold a broad array of investments and actively trade debt and equity securities (or related derivative securities) for their own account and for the accounts of their customers. Such investments and securities activities may involve securities and/or instruments of ours or our affiliates. The placement agent and its affiliates may also make investment recommendations and/or publish or express independent research views in respect of such securities or financial instruments and may hold, or recommend to clients that they acquire, long and/or short positions in such securities and instruments.

Electronic Distribution

A prospectus in electronic format may be made available on a website maintained by the placement agent and the placement agent may distribute prospectuses electronically. Other than the prospectus in electronic format, the information on these websites is not part of this prospectus or the registration statement of which this prospectus forms a part, has not been approved and/or endorsed by us or the placement agent and should not be relied upon by investors.

Transfer Agent and Registrar

The transfer agent and registrar for our common stock is Equiniti Trust Company, LLC.

Stock Market Listing

Our common stock is listed on Nasdaq under the symbol “BBLG.”

LEGAL MATTERS

The validity of the issuance of the common stock offered by us in this offering will be passed upon for us Harter Secrest & Emery LLP, Rochester, NY. Certain legal matters in connection with this offering will be passed upon for the placement agent by .

EXPERTS

The Company's consolidated financial statements appearing elsewhere in this prospectus have been included herein in reliance upon the report, which includes an explanatory paragraph as to our ability to continue as a going concern, of Weinberg & Company, P.A., an independent registered public accounting firm, appearing elsewhere herein, and upon the authority of Weinberg & Company, P.A. as experts in accounting and auditing.

WHERE YOU CAN FIND MORE INFORMATION

We are subject to the periodic reporting requirements of the Exchange Act, and we will file periodic reports, proxy statements and other information with the SEC. These periodic reports, proxy statements and other information are available at www.sec.gov. We maintain a website at www.bonebiologics.com. We have not incorporated by reference into this prospectus the information contained in, or that can be accessed through, our website, and you should not consider it to be a part of this prospectus. You may access our Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K and amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Exchange Act with the SEC free of charge at our website as soon as reasonably practicable after such material is electronically filed with, or furnished to, the SEC. You may also request a copy of these filings (other than exhibits to these documents unless the exhibits are specifically incorporated by reference into these documents or referred to in this prospectus), at no cost, by writing us at 2 Burlington Woods Drive, Suite 100, Burlington, MA 01803 or contacting us at (781) 552-4452.

We have filed with the SEC a registration statement under the Securities Act relating to the offering of these securities. The registration statement, including the attached exhibits, contains additional relevant information about us and the securities. This prospectus does not contain all of the information set forth in the registration statement. You may review a copy of the registration statement and any documents incorporated by reference herein through the SEC's website at www.sec.gov.

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Report of Independent Registered Public Accounting Firm

To the Stockholders and Board of Directors of Bone Biologics Corporation

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Bone Biologics Corporation (the “Company”) as of December 31, 2022 and 2021, the related consolidated statements of operations, stockholders’ equity (deficit), and cash flows for the years then ended, and the related notes (collectively referred to as the “financial statements”). In our opinion, the financial statements present fairly, in all material respects, the consolidated financial position of the Company as of December 31, 2022 and 2021, and the consolidated results of its operations and its cash flows for the years then ended in conformity with accounting principles generally accepted in the United States of America.

Going Concern

The accompanying financial statements have been prepared assuming that the Company will continue as a going concern. As discussed in Note 1 to the financial statements, during the year ended December 31, 2022 the Company incurred a net loss and utilized cash flows in operations, and has had recurring losses since inception. These conditions raise substantial doubt about the Company’s ability to continue as a going concern. Management’s plans in regard to these matters are also described in Note 1. The financial statements do not include any adjustments that might result from the outcome of this uncertainty.

Basis for Opinion

These financial statements are the responsibility of the Company’s management. Our responsibility is to express an opinion on these financial statements based on our audits. We are a public accounting firm registered with the Public Accounting Oversight Board (United States) (“PCAOB”) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. The Company is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. As part of our audits we are required to obtain an understanding of internal control over financial reporting but not for the purpose of expressing an opinion on the effectiveness of the Company’s internal control over financial reporting. Accordingly, we express no such opinion.

Our audits included performing procedures to assess the risks of material misstatement, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that our audits provide a reasonable basis for our opinion.

Critical Audit Matter

The critical audit matter communicated below is a matter arising from the current period audit of the financial statements that was communicated or required to be communicated to the audit committee and that (1) relates to accounts or disclosures that are material to the financial statements and (2) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matter below, providing separate opinion on the critical audit matter or on the accounts or disclosures to which it relates.

Warrant liability

As described in Note 3 to the financial statements, during the year ended December 31, 2022, the Company issued warrants that required management to assess whether the warrants required liability classification. The Company determined that the warrants were required to be accounted for as liabilities and recorded at fair value when issued and subsequently remeasured to fair value upon settlement or at the end of each reporting period. The Company’s warrant liability balance was \$1.7 million at December 31, 2022. The Company determines the fair value of the warrant liabilities utilizing the Black-Scholes pricing model.

We identified auditing the determination and valuation of the warrant liabilities as a critical audit matter due to the significant judgements used by the Company in determining whether the warrants required liability classification and the significant judgements used in determining the fair value of the warrant liabilities. This required a high degree of auditor judgment and increased auditor effort in auditing the determination and valuation of the warrant liabilities.

The primary procedures we performed to address this critical audit matter included:

- We inspected and reviewed the warrant agreements to evaluate the Company’s determination of whether liability accounting was required.
- We tested the reasonableness of the assumptions used by the Company in the Black-Scholes model, including exercise price, expected term, expected volatility, and risk-free interest rate.
- We developed an independent expectation of the warrant liability using a Black-Scholes model and compared our independent expectation to the Company’s estimate.

We have served as the Company’s auditor since 2017.

/s/Weinberg & Company, P.A.
Los Angeles, California

Bone Biologics Corporation
Consolidated Balance Sheets

	<u>December 31, 2022</u>	<u>December 31, 2021</u>
Assets		
Current Assets		
Cash	\$ 7,538,312	\$ 6,675,365
Prepaid expenses	<u>956,925</u>	<u>-</u>
Total assets	<u>\$ 8,495,237</u>	<u>\$ 6,675,365</u>
Liabilities and Stockholders' Equity		
Current Liabilities		
Accounts payable and accrued expenses	\$ 888,461	\$ 99,909
Warrant liability	<u>1,659,468</u>	<u>-</u>
Total current liabilities	<u>2,547,929</u>	<u>99,909</u>
Total liabilities	<u>2,547,929</u>	<u>99,909</u>
Commitments and Contingencies		
Stockholders' Equity		
Preferred Stock, \$0.001 par value per share; 20,000,000 shares authorized; none issued or outstanding at December 31, 2022 and 2021	-	-
Common stock, \$0.001 par value per share; 100,000,000 shares authorized; 63,820 and 43,189 shares issued and outstanding at December 31, 2022 and 2021, respectively	64	43
Additional paid-in capital	77,907,471	77,051,020
Accumulated deficit	<u>(71,960,227)</u>	<u>(70,475,607)</u>
Total stockholders' equity	<u>5,947,308</u>	<u>6,575,456</u>
Total liabilities and stockholders' equity	<u>\$ 8,495,237</u>	<u>\$ 6,675,365</u>

See accompanying notes to consolidated financial statements.

Bone Biologics Corporation
Consolidated Statements of Operations

	<u>Year Ended December 31, 2022</u>	<u>Year Ended December 31, 2021</u>
Revenues	\$ -	\$ -
Cost of revenues	<u>-</u>	<u>-</u>
Gross profit	-	-
Operating expenses		
Research and development	1,579,298	82,044
General and administrative	<u>2,085,875</u>	<u>1,021,032</u>
Total operating expenses	<u>3,665,173</u>	<u>1,103,076</u>
Loss from operations	(3,665,173)	(1,103,076)
Other income (expenses)		
Finance cost related to public offering	(731,714)	-
Change in fair value of warrant liability	2,912,267	-
Interest expense - related party	-	(805,109)
Gain on forgiveness of deferred compensation	<u>-</u>	<u>297,500</u>
Total other income (expenses)	<u>2,180,553</u>	<u>(507,609)</u>
Net loss	<u><u>\$ (1,484,620)</u></u>	<u><u>\$ (1,610,685)</u></u>
Weighted average shares outstanding - basic and diluted	<u>47,658</u>	<u>18,986</u>
Loss per share - basic and diluted	<u><u>\$ (31.15)</u></u>	<u><u>\$ (84.84)</u></u>

See accompanying notes to consolidated financial statements.

Bone Biologics Corporation
Consolidated Statement of Stockholders' Equity (Deficit)

	<i>Common Stock</i>		Additional	Accumulated	Total
	<u>Shares</u>	<u>Amount</u>	<u>Paid-in Capital</u>	<u>Deficit</u>	<u>Stockholders' Deficit</u>
Balance at December 31, 2020	51,199	\$ 51	\$ 55,172,561	\$(68,864,922)	\$ (13,692,310)
Fair value of vested stock options issued to employees and Directors	-	-	207,035	-	207,035
Proceeds from sale of common stock units in public offering, net of offering costs \$1,073,311	6,294	6	6,858,837	-	6,858,843
Shares issued upon debt and accrued interest conversion	24,703	25	14,821,910	-	14,821,935
Cancellation of collateral shares upon debt conversion	(39,007)	(39)	(9,323)	-	(9,362)
Net Loss	<u>-</u>	<u>-</u>	<u>-</u>	<u>(1,610,685)</u>	<u>(1,610,685)</u>
Balance at December 31, 2021	43,189	43	77,051,020	(70,475,607)	6,575,456
Fair value of vested stock options issued to employees and directors	-	-	266,633	-	266,633
Proceeds from sale of common stock units in public offering, net of offering costs \$686,822	15,741	16	4,429,844	-	4,429,860
Fair value of warrant liability recognized upon issuance of warrants	-	-	(4,429,860)	-	(4,429,860)
Exercise of warrants	4,890	5	(5)	-	-
Extinguishment of warrant liability upon exercise of warrants	-	-	589,839	-	589,839
Net Loss	<u>-</u>	<u>-</u>	<u>-</u>	<u>(1,484,620)</u>	<u>(1,484,620)</u>
Balance at December 31, 2022	<u>63,820</u>	<u>\$ 64</u>	<u>\$ 77,907,471</u>	<u>\$(71,960,227)</u>	<u>\$ 5,947,308</u>

See accompanying notes to consolidated financial statements.

Bone Biologics Corporation
Consolidated Statements of Cash Flows

	<u>Year Ended December 31, 2022</u>	<u>Year Ended December 31, 2021</u>
Cash flows from operating activities		
Net loss	\$ (1,484,620)	\$ (1,610,685)
Adjustments to reconcile net loss to net cash used in operating activities:		
Stock-based compensation	266,633	207,035
Finance cost related to public offering	731,714	-
Change in fair value of warrant liability	(2,912,267)	-
Interest payable – related party	-	793,051
Gain on forgiveness of deferred compensation	-	(297,500)
Changes in operating assets and liabilities:		
Prepaid expenses and other current assets	(956,925)	-
Accounts payable and accrued expenses	788,552	(365,487)
Deferred compensation	-	45,000
	<u>(3,566,913)</u>	<u>(1,228,586)</u>
Net cash used in operating activities		
	<u>(3,566,913)</u>	<u>(1,228,586)</u>
Cash flows from financing activities		
Cash overdraft	-	(10,609)
Proceeds from sale of common stock units in public offering, net of offering costs	4,429,860	6,858,843
Proceeds from credit facilities – related party	-	1,055,717
	<u>4,429,860</u>	<u>7,903,951</u>
Net cash provided by financing activities		
	<u>4,429,860</u>	<u>7,903,951</u>
Net increase in cash	862,947	6,675,365
Cash, beginning of year	6,675,365	-
Cash, end of year	\$ 7,538,312	\$ 6,675,365
Supplemental information		
Interest paid - related party	\$ -	\$ 12,059
Income taxes paid	\$ -	\$ -
Non-cash financing activities		
Issuance of shares upon cashless exercise of warrants	\$ -	\$ -
Common shares issued upon conversion of Related Party Notes Payable and credit facilities	\$ -	\$ 14,821,935

See accompanying notes to consolidated financial statements.

Bone Biologics Corporation
Notes to Consolidated Financial Statements

1. The Company

Bone Biologics Corporation (the “Company”) was incorporated under the laws of the State of Delaware on October 18, 2007 as AFH Acquisition X, Inc. Pursuant to a Merger Agreement, dated September 19, 2014, by and among the Company, its wholly-owned subsidiary, Bone Biologics Acquisition Corp., (“Merger Sub”), and Bone Biologics, Inc., Merger Sub merged with and into Bone Biologics Inc., with Bone Biologics Inc. remaining as the surviving corporation. On September 22, 2014, the Company changed its name to “Bone Biologics Corporation” and Bone Biologics, Inc. became a wholly owned subsidiary of the Company. Bone Biologics, Inc. was incorporated in California on September 9, 2004.

We are a medical device company that is currently focused on bone regeneration in spinal fusion using the recombinant human protein known as NELL-1. NELL-1 in combination with DBM, demineralized bone matrix, is an osteopromotive recombinant protein that provides target specific control over bone regeneration. The NELL-1 technology platform, has been licensed exclusively for worldwide applications to us through a technology transfer from the UCLA Technology Development Group on behalf of UC Regents (“UCLA TDG”). UCLA TDG and the Company received guidance from the FDA that NELL-1/DBM will be classified as a device/drug combination product with a pre-market approval filing (“PMA”).

The production and marketing of the Company’s products and its ongoing research and development activities will be subject to extensive regulation by numerous governmental authorities in the United States. Prior to marketing in the United States, any combination product developed by the Company must undergo rigorous preclinical (animal) and clinical (human) testing and an extensive regulatory approval process implemented by the FDA under the Food, Drug and Cosmetic Act. There can be no assurance that the Company will not encounter problems in clinical trials that will cause the Company or the FDA to delay or suspend clinical trials.

The Company’s success will depend in part on its ability to obtain patents and product license rights, maintain trade secrets, and operate without infringing on the proprietary rights of others, both in the United States and other countries. There can be no assurance that patents issued to or licensed by the Company will not be challenged, invalidated, or circumvented, or that the rights granted thereunder will provide proprietary protection or competitive advantages to the Company.

On October 12, 2021, an amendment to our certificate of incorporation for a reverse split of the Company’s outstanding common stock at a ratio of 1 for 2.5 became effective. On June 24, 2021, our board of directors authorized the amendment which became effective upon distribution to the stockholders of the Company and in conjunction with the Company’s Common Stock being listed on the Nasdaq Capital Market. Our common stock became listed on the Nasdaq Capital Market on October 13, 2021.

Reverse stock splits

On June 5, 2023, the Company filed an amendment to its certificate of incorporation, as amended, with the Secretary of State of the State of Delaware to effect a 1-for-30 reverse stock split of its outstanding common stock and warrants. The amendment was authorized by the Company’s stockholders on May 1, 2023, and was effective on June 5, 2023.

On December 14, 2023, the Company filed an amendment to its certificate of incorporation, as amended, with the Secretary of State of the State of Delaware to effect a 1-for-8 reverse stock split of its outstanding common stock and warrants. The amendment was authorized by the Company’s stockholders on December 12, 2023, and was effective on December 20, 2023.

All share and per share amounts have been retro-actively restated as if the reverse splits occurred at the beginning of the earliest period presented.

Going Concern and Liquidity

The Company has no significant operating history and since inception to December 31, 2022 has incurred accumulated losses of approximately \$72 million. The Company will continue to incur significant expenses for development activities for their lead product NELL-1/DBM. Operating expenditures for the next twelve months are estimated at \$8.8 million. The accompanying consolidated financial statements for the year ended December 31, 2022 have been prepared assuming the Company will continue as a going concern. As reflected in the financial statements, the Company incurred a net loss of \$1,484,620, and used net cash in operating activities of \$3,566,913 during the year ended December 31, 2022. These factors raise substantial doubt about the Company's ability to continue as a going concern within one year after the date that the financial statements are issued. The consolidated financial statements do not include any adjustments related to the recoverability and classification of recorded asset amounts or the amounts and classification of liabilities that might be necessary should the Company be unable to continue as a going concern.

On October 12, 2022, the Company completed a public equity offering, generating gross proceeds to the Company of \$5,100,000, and net proceeds, after underwriters discounts and expenses, of approximately \$4,454,000 (see Note 5).

The Company will continue to attempt to raise additional debt and/or equity financing to fund future operations and to provide additional working capital. However, there is no assurance that such financing will be consummated or obtained in sufficient amounts necessary to meet the Company's needs. If cash resources are insufficient to satisfy the Company's on-going cash requirements, the Company will be required to scale back or discontinue its product development programs, or obtain funds if available (although there can be no certainties) through strategic alliances that may require the Company to relinquish rights to its technology, substantially reduce or discontinue its operations entirely. No assurance can be given that any future financing will be available or, if available, that it will be on terms that are satisfactory to the Company. Even if the Company is able to obtain additional financing, it may contain undue restrictions on our operations, in the case of debt financing, or cause substantial dilution for our stockholders, in the case of equity financing.

2. Summary of Significant Accounting Policies

Basis of Presentation

The accompanying consolidated financial statements and related notes include activities of the Company and have been prepared in conformity with accounting principles generally accepted in the United States of America ("GAAP").

Use of Estimates

The preparation of the accompanying consolidated financial statements in conformity with GAAP requires management to make certain estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the consolidated financial statements and reported amounts of expenses during the reporting period. Significant estimates include the assumptions used in the accrual for potential liabilities, the valuation of debt and equity instruments, the valuation of stock options and warrants issued for services, and deferred tax valuation allowances. Actual results could differ from those estimates.

Impact of the Novel Coronavirus (COVID-19) on the Company's Business Operations

The global outbreak of the novel coronavirus (COVID-19) has led to severe disruptions in general economic activities worldwide, as businesses and governments have taken broad actions to mitigate this public health crisis. In light of the uncertain and continually evolving situation relating to the spread of COVID-19, this pandemic could pose a risk to the Company. The extent to which the coronavirus may impact the Company's business operations will depend on future developments, which are highly uncertain and cannot be predicted at this time. The Company intends to continue to monitor the situation and may adjust its current business plans as more information and guidance become available.

The coronavirus pandemic presents a challenge to medical facilities worldwide. As the Company’s clinical trials are conducted on an outpatient basis, it is not currently possible to predict the full impact of this developing health crisis on such clinical trials, which could include delays in and increased costs of such clinical trials. Current indications from the clinical research organizations conducting the clinical trials for the Company are that such clinical trials are being delayed or extended for several months as a result of the coronavirus pandemic.

There is also significant uncertainty as to the effect that the coronavirus may have on the amount and type of financing available to the Company in the future.

Inflation

Macroeconomic factors such as inflation, rising interest rates, governmental responses there to and possible recession caused thereby also add significant uncertainty to our operations and possible effects to the amount and type of financing available to the Company in the future.

Cash

Cash primarily consists of bank demand deposits maintained by a major financial institution. The Company’s policy is to maintain its cash balances with financial institutions with high credit ratings and in accounts insured by the Federal Deposit Insurance Corporation (the “FDIC”) and/or by the Securities Investor Protection Corporation (the “SIPC”). The Company may periodically have cash balances in financial institutions in excess of the FDIC and SIPC insurance limits of \$250,000 and \$500,000, respectively. The Company has not experienced any losses to date resulting from this policy.

Fair Value of Financial Instruments

Accounting standards require certain assets and liabilities be reported at fair value in the financial statements and provide a framework for establishing that fair value. The Company defines fair value as the exchange price that would be received for an asset or paid to transfer a liability (an exit price) in the principal or most advantageous market for the asset or liability in an orderly transaction between market participants on the measurement date. Valuation techniques used to measure fair value must maximize the use of observable inputs and minimize the use of unobservable inputs. The fair value hierarchy is based on three levels of inputs that may be used to measure fair value, of which the first two are considered observable and the last is considered unobservable:

Level 1: Quoted prices in active markets for identical assets or liabilities.

Level 2: Inputs other than Level 1 that are observable, either directly or indirectly, such as quoted prices for similar assets or liabilities; quoted prices in markets that are not active; or other inputs that are observable or can be corroborated by observable market data for substantially the full term of the assets or liabilities.

Level 3 assumptions: Unobservable inputs that are supported by little or no market activity and that are significant to the fair value of the assets or liabilities including liabilities resulting from embedded derivatives associated with certain warrants to purchase common stock.

There were no financial instruments measured on a recurring basis outstanding as of December 31, 2022. The fair value of financial instruments measured on a recurring basis was as follows as of December 31, 2022:

Description	As of December 31, 2022			
	Total	Level 1	Level 2	Level 3
Liabilities:				
Warrant liability	\$ 1,659,468	—	—	\$ 1,659,468
Total liabilities at fair value	\$ 1,659,468	—	—	\$ 1,659,468

As of December 31, 2021, there was no warrant liability. The following table provides a roll-forward of the warrant liability measured at fair value on a recurring basis using unobservable level 3 inputs for the years ended December 31, 2022 as follows:

	2022
Warrant liability	
Balance as of beginning of period – December 31, 2021	\$ -
Fair value of warrant liability recognized upon issuance of warrants	5,161,574
Extinguishment of warrant liability upon exercise of warrants	(589,839)
Change in fair value	(2,912,267)
Balance as of end of period – December 31, 2022	\$ 1,659,468

The Company’s financial instruments are cash, accounts payable and the warrant liability. The recorded values of cash, and accounts payable approximate their values based on their short-term nature.

Prepaid Expenses

At December 31, 2022, prepaid expenses consist of prepaid insurance and prepaid services. Prepaid expenses are amounts paid to secure the use of assets or the receipt of services at a future date or continuously over one or more future periods. When the prepaid expenses are eventually consumed, they are charged to expense. The Company had \$956,925 and \$-0- in prepaid expenses December 31, 2022 and 2021, respectively.

Research and Development Costs

Research and development costs include, but are not limited to, payroll and other personnel expenses, consultants, expenses incurred under agreements with contract research and manufacturing organizations and animal clinical investigative sites and the cost to manufacture clinical trial materials. Costs related to research, design and development of products are charged to research and development expense as incurred.

Patents and Licenses

Effective April 9, 2019, we entered into an Amended and Restated Exclusive License Agreement dated as of March 21, 2019 and amended through three sets of amendments (as so amended the “Amended License Agreement”) with the UCLA TDG. The Amended License Agreement amends and restates the Amended and Restated Exclusive License Agreement, dated as of June 19, 2017 (the “2017 Agreement”). The 2017 Agreement amended and restated the Exclusive License Agreement, effective March 15, 2006, between the Company and UCLA TDG, as amended by ten amendments. See Note 7 for commitments related to the Exclusive License Agreement. Patent expenses include costs to acquire the license of NELL-1, which was de minimis, and costs to file patent applications related to NELL-1.

The Company expenses the costs incurred to file patent applications, all costs related to abandoned patent applications and maintenance costs, and these costs are included in general and administrative expenses. Costs associated with licenses acquired to be able to use products from third parties prior to receipt of regulatory approval to market the related products are also expensed. The Company’s licensed technologies may have alternative future uses in that they are enabling (or platform) technologies that can be the basis for multiple products that would each target a specific indication. Costs of acquisition of licenses are expensed.

Stock Based Compensation

ASC 718, *Compensation – Stock Compensation*, prescribes accounting and reporting standards for all share-based payment transactions to employees and non-employees. Transactions include incurring liabilities, or issuing or offering to issue shares, options, and other equity instruments such as employee stock ownership plans and stock appreciation rights. Share-based payments to employees, including grants of employee stock options, are recognized as compensation expense in the consolidated financial statements based on their fair values. That expense is recognized over the period during which an employee is required to provide services in exchange for the award, known as the requisite service period (usually the vesting period). Recognition of compensation expense for non-employees is in the same period and manner as if the Company had paid cash for the services.

Income Taxes

The Company uses an asset and liability approach for accounting and reporting for income taxes that allows recognition and measurement of deferred tax assets based upon the likelihood of realization of tax benefits in future years. Under the asset and liability approach, deferred taxes are provided for the net tax effects of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for income tax purposes. A valuation allowance is provided for deferred tax assets if it is more likely than not these items will either expire before the Company is able to realize their benefits, or that future deductibility is uncertain. The Company’s policy is to recognize interest and/or penalties related to income tax matters in income tax expense. No such amounts are accrued as of December 31, 2022 and 2021.

Loss per Common Share

Basic loss per share is computed by dividing the loss available to common shareholders by the weighted-average number of common shares outstanding during the period. All collateral shares were returned and cancelled on October 13, 2021 when the outstanding debt was converted. Diluted loss per share is computed similar to basic loss per share except that the denominator is increased to include the number of additional common shares that would have been outstanding if the potential common shares had been issued and if the additional common shares were dilutive. Diluted loss per common share reflects the potential dilution that could occur if convertible debentures, options and warrants were to be exercised or converted or otherwise resulted in the issuance of common stock that then shared in the earnings of the entity.

Since the effects of outstanding options, warrants, and the conversion of convertible debt are anti-dilutive for the years ended December 31, 2022 and 2021, shares of common stock underlying these instruments have been excluded from the computation of loss per common share.

The following sets forth the number of shares of common stock underlying outstanding options, warrants, and convertible debt as of December 31, 2022 and 2021:

	December 31,	
	2022	2021
Warrants	57,692	7,620
Stock options	1,910	1,023
	59,602	8,643

New Accounting Standards

In August 2020, the FASB issued ASU No. 2020-06 (“ASU 2020-06”) “Debt—Debt with Conversion and Other Options (Subtopic 470-20) and Derivatives and Hedging—Contracts in Entity’s Own Equity (Subtopic 815-40).” ASU 2020-06 reduces the number of accounting models for convertible debt instruments by eliminating the cash conversion and beneficial conversion models. The diluted net income per share calculation for convertible instruments will require the Company to use the if-converted method. For contracts in an entity’s own equity, the type of contracts primarily affected by this update are freestanding and embedded features that are accounted for as derivatives under the current guidance due to a failure to meet the settlement conditions of the derivative scope exception. This update simplifies the related settlement assessment by removing the requirements to (i) consider whether the contract would be settled in registered shares, (ii) consider whether collateral is required to be posted, and (iii) assess shareholder rights. ASU 2020-06 is effective January 1, 2024, for the Company and the provisions of this update can be adopted using either the modified retrospective method or a fully retrospective method. Early adoption is permitted, but no earlier than January 1, 2021, including interim periods within that year. Effective January 1, 2021, the Company early adopted ASU 2020-06 and that adoption did not have an impact on our financial statements and related disclosures.

Other recent accounting pronouncements issued by the FASB, its Emerging Issues Task Force, the American Institute of Certified Public Accountants, and the Securities and Exchange Commission did not or are not believed by management to have a material impact on the Company’s present or future financial statements.

3. Warrant Liability

In October 2022, the Company completed a public equity offering (see Note 5), which included the issuance of 54,174 warrants. The warrants provide for a Black Scholes value calculation in the event of certain transactions (“Fundamental Transactions,” as defined), which includes a floor on volatility utilized in the value calculation at 100% or greater. The Company has determined that this provision introduces leverage to the holders of the warrants that could result in a value that would be greater than the settlement amount of a fixed-for-fixed option on the Company’s own equity shares. Accordingly, pursuant to ASC 815, the Company has classified the fair value of the warrants as a liability to be re-measured at the end of every reporting period with the change in value reported in the statement of operations.

The warrant liability was valued at the following dates using a Black-Scholes model with the following assumptions:

	December 31, 2022	October 12, 2022 (date issued)
Warrant liability:		
Risk-free interest rate	4.26%	4.12%
Expected volatility	112.58%	112.73%
Expected life (in years)	4.78	5.0
Expected dividend yield	-	-
Fair Value:		
Warrant liability	\$ 1,659,468	\$ 5,161,574

The risk-free rate is based on the U.S. Treasury yield curve in effect at the time of grant. Expected volatility was determined based on the historical volatility data of similar companies, considering the industry, products and market capitalization of such other entities. The expected term of the warrants granted are determined based on the duration of time the warrants are expected to be outstanding. The dividend yield on the Company’s warrants is assumed to be zero as the Company has not historically paid dividends.

4. Income Taxes

The provision for income taxes consists of the following:

Year Ended	December 31, 2022	December 31, 2021
Current:		
Federal	\$ -	\$ -
State	-	-
Total current	-	-
Deferred:		
Federal	-	-
State	-	-
Total deferred	-	-
Provision for income taxes	\$ -	\$ -

The components of deferred tax assets and liabilities consist of the following:

	December 31, 2022	December 31, 2021
Deferred tax assets		
Net operating losses	\$ 10,971,000	\$ 9,189,000
Accrued expenses	692,000	693,000
R&D credits	938,000	624,000
Stock compensation	7,751,000	8,287,000
Total	20,352,000	18,793,000
Less: Valuation allowance	(20,352,000)	(18,793,000)
	\$ -	\$ -

The Company’s federal and state net operating loss carryforwards at December 31, 2022 and 2021 were approximately \$35,757,000 and \$32,673,000, respectively, and will begin to expire in 2027 if not utilized.

The Company reviews its deferred tax assets for realization based upon historical taxable income, prudent and feasible tax planning strategies, the expected timing of the reversals of existing temporary differences and expected future taxable income. The Company has concluded that it is more likely than not that the deferred tax assets will not be realized. Accordingly, the Company has recorded a valuation allowance against the net deferred tax assets in the amount of \$20,352,000 at December 31, 2022. The net change in the valuation allowance for the year ended December 31, 2022 was \$1,559,000.

The effective tax rate differs from the statutory tax rate principally due to the change in valuation allowance, nondeductible permanent differences, credits, and state income taxes.

A reconciliation of the federal income tax rate to the Company’s effective tax rate for the years ended December 31, 2022 and 2021 is as follows:

	December 31, 2022	December 31, 2021
Statutory federal income tax rate	21.0%	21.0%
State taxes, net of federal tax benefit	24.9%	6.2%
Nondeductible permanent items	(4.4)%	(0.1)%
Deferred tax rate change	-%	-%
Research and development credit	21.1%	0.3%
Change in valuation allowance	(62.6)%	(27.4)%
Income tax provision	0.0%	0.0%

The Company’s effective tax rate is 0% for income tax for the years ended December 31, 2022 and 2021. Based on the weight of available evidence, including cumulative losses since inception and expected future losses, the Company has determined that it is more likely than not that the deferred tax asset amount will not be realized and therefore a valuation allowance has been provided on net deferred tax assets.

The Company files tax returns for U.S. Federal, State of Massachusetts, and State of California. The Company is not currently subject to any income tax examinations. Since the Company’s inception, the Company had incurred losses from operations, which generally allows all tax years to remain open.

5. Stockholders’ Deficit

Preferred Stock

The Company’s amended and restated certificate of incorporation authorizes the Company to issue a total of 20,000,000 shares of preferred stock. No shares have been issued.

Common Stock

The Company’s amended and restated certificate of incorporation authorizes the Company to issue a total of 100,000,000 shares of common stock. As of December 31, 2022 and 2021, the Company had an aggregate of 63,820 and 43,189 shares of common stock outstanding, respectively.

2022

On October 12, 2022, the Company completed a public offering of 15,741 units (the “2022 Units”) at a price of \$324.00 per unit, generating gross proceeds to the Company of \$5,100,000, and net proceeds, after underwriters discounts and expenses, of approximately \$4,454,000. Each unit consists of: (i) one share of common stock, par value \$0.001 per share; (ii) one Series A warrant to purchase one share of common stock at an exercise price equal to \$388.80 per share (120% of the per 2022 Unit offering price), exercisable until the fifth anniversary of the issuance date; (iii) one Series B warrant to purchase one share of common stock at an exercise price equal to \$324.00 per share (100% of the per 2022 Unit offering price), exercisable until the fifth anniversary of the issuance date; and (iv) one Series C warrant to purchase one share of common stock at an exercise price equal to \$518.40 per share (160% of the per 2022 Unit offering price), exercisable until the fifth anniversary of the issuance date.

The underwriter also received 788 warrants as part of the offering at an exercise price of \$324.00 per common share representing 5% of the raise.

In October 2022, 4,890 Series C warrants were exchanged for 4,890 shares of common stock.

2021

On October 15, 2021, the Company completed a public offering (the “October 2021 Primary Offering”) of 6,294 units (the “2021 Units”). Each Unit consists of one share of common stock of the Company, par value \$0.001 per share (the “Common Stock”), and one warrant (a “Warrant”) to purchase one share of Common Stock for \$1,512.00 per share. The Units were sold at a price of \$1,260.00 per Unit, generating net proceeds to the Company of \$6,858,843. The Company granted to WallachBeth Capital LLC, the underwriter in the Offering, a 45-day option to purchase up to 944 additional shares of Common Stock and/or 944 Warrants to cover over-allotments, if any. The underwriter has exercised its option with respect to the Warrants. WallachBeth also received 380 warrants as part of the October 2021 Primary Offering at an exercise price of \$1,512.00 per common share representing 6% of the raise.

During October 2021, Hankey Capital converted all the outstanding convertible notes in accordance with the original term of the note agreements (\$12,767,894 in principal amount and \$2,054,041 of accrued interest) into 24,703 shares of our common stock and 39,007 collateral shares were cancelled.

6. Common Stock Warrants

A summary of warrant activity for the years ended December 31, 2022 and 2021 are presented below:

Subject to Exercise	Number of Warrants	Weighted Average Exercise Price	Weighted Average Life (Years)
Outstanding as of December 31, 2020	382	\$ 3,571.20	0.34
Granted – 2021	7,620	1,512.00	5.00
Forfeited/Expired – 2021	(382)	-	-
Exercised – 2021	-	-	-
Outstanding as of December 31, 2021	7,620	\$ 1,512.00	4.79
Granted – 2022	54,962	391.20	5.00
Forfeited/Expired – 2022	-	-	-
Exercised – 2022	(4,890)	-	4.78
Outstanding as of December 31, 2022	57,692	\$ 427.20	4.65

As of December 31, 2022, the Company had outstanding vested and unexercised Common Stock Warrants as follows:

Date Issued	Exercise Price	Number of Warrants	Expiration date
October 2021	\$ 1,512.00	7,620	October 13, 2026
October 2022	\$ 388.80	18,846	October 12, 2027
October 2022	\$ 324.00	18,058	October 12, 2027
October 2022	\$ 0.00	13,168	October 12, 2027
Total outstanding warrants at December 31, 2022		<u>57,692</u>	

Based on a fair market value of \$50.40 per share on December 31, 2022, there 13,168 exercisable but unexercised in-the-money common stock warrants on that date. Accordingly, the intrinsic value attributed to exercisable but unexercised common stock warrants at December 31, 2022 was \$663,639.

7. Stock-based Compensation

2015 Equity Incentive Plan

The Company has 4,489 shares of Common Stock authorized and reserved for issuance under our 2015 Equity Incentive Plan for option awards. This reserve may be increased by the Board each year by up to the number of shares of stock equal to 5% of the number of shares of stock issued and outstanding on the immediately preceding December 31. Appropriate adjustments will be made in the number of authorized shares and other numerical limits in our 2015 Equity Incentive Plan and in outstanding awards to prevent dilution or enlargement of participants' rights in the event of a stock split or other change in our capital structure. Shares subject to awards granted under our 2015 Equity Incentive Plan which expire, are repurchased or are cancelled or forfeited will again become available for issuance under our 2015 Equity Incentive Plan. The shares available will not be reduced by awards settled in cash. Shares withheld to satisfy tax withholding obligations will not again become available for grant. The gross number of shares issued upon the exercise of stock appreciation rights or options exercised by means of a net exercise or by tender of previously owned shares will be deducted from the shares available under our 2015 Equity Incentive Plan.

Awards may be granted under our 2015 Equity Incentive Plan to our employees, including officers, director or consultants, and our present or future affiliated entities. While we may grant incentive stock options only to employees, we may grant non-statutory stock options, stock appreciation rights, restricted stock purchase rights or bonuses, restricted stock units, performance shares, performance units and cash-based awards or other stock based awards to any eligible participant.

The 2015 Equity Incentive Plan is administered by our compensation committee. Subject to the provisions of our 2015 Equity Incentive Plan, the compensation committee determines, in its discretion, the persons to whom, and the times at which, awards are granted, as well as the size, terms and conditions of each award. All awards are evidenced by a written agreement between us and the holder of the award. The compensation committee has the authority to construe and interpret the terms of our 2015 Equity Incentive Plan and awards granted under our 2015 Equity Incentive Plan.

A summary of stock option activity for the years ended December 31, 2022 and 2021 are presented below:

Subject to Exercise	Number of Options	Weighted Average Exercise Price	Weighted Average Life (Years)	Aggregate Intrinsic Value
Outstanding as of December 31, 2020	958	\$ 8,888.00	4.65	\$ -
Granted – 2021	207	1,017.60	10.00	-
Forfeited/Expired – 2021	(142)	9,715.20	-	-
Exercised – 2021	-	-	-	-
Outstanding as of December 31, 2021	1,023	\$ 7,862.40	5.43	\$ -
Granted – 2022	887	624.00	7.17	-
Forfeited/Expired – 2022	-	-	-	-
Exercised – 2022	-	-	-	-
Outstanding as of December 31, 2022	<u>1,910</u>	<u>\$ 4,041.60</u>	<u>5.60</u>	<u>\$ -</u>
Options vested and exercisable at December 31, 2022	<u>1,656</u>	<u>\$ 4,552.80</u>	<u>5.04</u>	<u>\$ -</u>

As of December 31, 2022, the Company had outstanding stock options as follows:

Date Issued	Exercise Price	Number of Options	Expiration date
August 2015	\$ 9,540.00	174	December 27, 2025
September 2015	\$ 9,540.00	36	December 27, 2025
November 2015	\$ 9,540.00	205	December 27, 2025
December 2015	\$ 9,540.00	12	December 27, 2025
January 2016	\$ 9,540.00	213	January 9, 2026
May 2016	\$ 12,300.00	45	May 26, 2026
September 2016	\$ 12,300.00	21	May 31, 2026
January 2017	\$ 12,300.00	10	January 1, 2027
January 2018	\$ 11,820.00	8	January 1, 2028
January 2019	\$ 564.00	92	January 1, 2029
October 2021	\$ 1,260.00	207	October 26, 2031
January 2022	\$ 844.80	111	January 1, 2032
January 2022	\$ 892.80	209	January 1, 2024
January 2022	\$ 892.80	105	January 3, 2024
August 2022	\$ 387.26	462	August 23, 2032
Total outstanding options at December 31, 2022		1,910	

Based on a fair value of \$50.40 per share on December 31, 2022, there was no intrinsic value attributed to exercisable but unexercised stock options at December 31, 2022.

There were 887 options granted during the year ended December 31, 2022 with a fair value of \$321,592. Vesting of options differs based on the terms of each option. During the year ended December 31, 2022 and 2021, the Company had stock-based compensation expense of \$266,633 and \$207,035, respectively, related to the vesting of stock options granted to the Company’s employees and directors included in our reported net loss. Our policy is to account for forfeitures of the unvested portion of option grants when they occur; therefore, these forfeitures are recorded as a reversal to expense, which can result in a credit balance in the statement of operations.

The Company utilized the Black-Scholes option-pricing model. The assumptions used for the years ended December 31, 2022 and 2021 are as follows:

	December 31, 2022	December 31, 2021
Risk free interest rate	0.39% - 3.157%	1.21%
Expected life (in years)	1.00 - 5.87	2 - 10
Expected Volatility	96.24% - 112.54%	113.93%
Expected dividend yield	0%	0%

At December 31, 2022, management determined that the Company has limited trading history by which to determine the volatility of its own common stock price. Accordingly, the fair value of the options was determined based on the historical volatility data of similar companies, considering the industry, products and market capitalization of such other entities. The risk-free interest rate used in the calculations is based on the implied yield available on U.S. Treasury issues with an equivalent term approximating the expected life of the options as calculated using the simplified method. The expected life of the options used was based on the contractual life of the option granted. Stock-based compensation is a non-cash expense because we settle these obligations by issuing shares of our common stock from our authorized shares instead of settling such obligations with cash payments.

As of December 31, 2022, total unrecognized compensation cost related to unvested stock options was \$54,959. The cost is expected to be recognized over a weighted average period of 0.37 years.

8. Commitments and Contingencies

UCLA TDG Exclusive License Agreement

Effective April 9, 2019, we entered into an Amended and Restated Exclusive License Agreement dated as of March 21, 2019 and amended through three sets of amendments (as so amended the “Amended License Agreement”) with the UCLA TDG. The Amended License Agreement amends and restates the Amended and Restated Exclusive License Agreement, dated as of June 19, 2017 (the “2017 Agreement”). The 2017 Agreement amended and restated the Exclusive License Agreement, effective March 15, 2006, between the Company and UCLA TDG, as amended by ten amendments. Under the terms of the Amended License Agreement, the Regents have continued to grant us exclusive rights to develop and commercialize NELL-1 (the “Licensed Product”) for spinal fusion by local administration, osteoporosis and trauma applications. The Licensed Product is a recombinant human protein growth factor that is essential for normal bone development.

We have agreed to pay an annual maintenance fee to UCLA TDG of \$10,000 as well as pay certain royalties to UCLA TDG under the Amended License Agreement at the rate of 3.0% of net sales of licensed products or licensed methods. We must pay the royalties to UCLA TDG on a quarterly basis. Upon a first commercial sale, we also must pay a minimum annual royalty between \$50,000 and \$250,000, depending on the calendar year which is after the first commercial sale. If we are required to pay any third party any royalties as a result of us making use of UCLA TDG patents, then we may reduce the royalty owed to UCLA TDG by 0.333% for every percentage point paid to a third party. If we grant sublicense rights to a third party to use the UCLA TDG patent, then we will pay UCLA TDG 10% to 20% of the sublicensing income we receive from such sublicense.

We are obligated to make the following milestone payments to UCLA TDG for each Licensed Product or Licensed Method:

- \$100,000 upon enrollment of the first subject in a Feasibility Study;
- \$250,000 upon enrollment of the first subject in a Pivotal Study;
- \$500,000 upon Pre-Market Approval of a Licensed Product or Licensed Method; and
- \$1,000,000 upon the First Commercial Sale of a Licensed Product or Licensed Method.

We are also obligated pay to UCLA TDG a fee (the “Diligence Fee”) of \$8,000,000 upon the sale of any Licensed Product (the “Triggering Sale Date”) in accordance with the payment schedule below:

- Due upon cumulative Net Sales equaling \$50,000,000 following the Triggering Sale Date - \$2,000,000;
- Due upon cumulative Net Sales equaling \$100,000,000 following the Triggering Sale Date - \$2,000,000; and
- Due upon cumulative Net Sales equaling \$200,000,000 following the Triggering Sale Date - \$4,000,000.

Our obligation to pay the Diligence Fee will survive termination or expiration of the agreement and we are prohibited from assigning, selling, or otherwise transferring any of its assets related to any Licensed Product unless our Diligence Fee obligation is assigned, sold, or transferred along with such assets, or unless we pay UCLA TDG the Diligence Fee within ten (10) days of such assignment, sale or other transfer of such rights to any Licensed Product.

We are also obligated to pay UCLA TDG a cash milestone payment within thirty (30) days of a Liquidity Event (including a Change of Control Transaction and a payment election by UCLA TDG exercisable after December 22, 2016) such payment to equal the greater of:

- \$500,000; or
- 2% of all proceeds in connection with a Change of Control Transaction.

As of December 31, 2022, none of the above milestones have been met.

We are obligated to diligently proceed with developing and commercializing licensed products under UCLA TDG patents set forth in the Amended License Agreement. UCLA TDG has the right to either terminate the license or reduce the license to a non-exclusive license if we do not meet certain diligence milestone deadlines set forth in the Amended License Agreement.

We must reimburse or pre-pay UCLA TDG for patent prosecution and maintenance costs incurred during the term of the Amended License Agreement. We have the right to bring infringement actions against third party infringers of the Amended License Agreement, UCLA TDG may join voluntarily, at its own expense, or, at our expense, be joined involuntarily to the action. We are required to indemnify UCLA TDG against any third party claims arising out of our exercise of the rights under the Amended License Agreement or any sublicense.

Payments to UCLA TDG under the Amended License Agreement for the years ended December 31, 2022 and 2021 were \$25,623 and \$45,500, respectively.

Development Contracts

During the year ended December 31, 2022, the Company entered into two contracts with one vendor for development activities of NELL-1. At December 31, 2022, there was \$295,990 of prepaid expenses and \$755,359 in accounts payable for this vendor. Amounts remaining for services contained within the contracts was \$5,625,731 at December 31, 2022.

Contingencies

The Company is subject to claims and assessments from time to time in the ordinary course of business. The Company's management does not believe that any such matters, individually or in the aggregate, will have a material adverse effect on the Company's business, financial condition, results of operations or cash flows.

In July 2019, Dr. Bessie (Chia) Soo and Dr. Kang (Eric) Ting ("Plaintiffs") filed a complaint (the "Complaint") in federal court in Massachusetts against the Company, Bruce Stroeve ("Stroeve"), John Booth ("Booth"), Stephen LaNeve ("LaNeve", and together with Stroeve and Booth, the "Individual Defendants"), and MTF Biologics (f/k/a The Musculoskeletal Transplant Foundation, Inc.) ("MTF"). The Complaint alleges claims for breach of contract against the Company and tortious interference with contract against the Individual Defendants and MTF arising from the termination of the Professional Service Agreements, dated as of January 8, 2016, between the Company and each of the Plaintiffs. The Individual Defendants have been sued for actions taken by them in connection with their service to the Company as directors and/or officers of the Company. As such, the Company has certain indemnification obligations to the Individual Defendants. The Company and the Individual Defendants intend to vigorously defend against the allegations in the Complaint. Although the Complaint was filed several years ago, due to the Covid-19 Pandemic and long delays in the court ruling on various motions to dismiss, in terms of case progression the case is still in its early stages with the claims in the case not being set until April 2022 and preliminary discovery starting since then. Based on the early stage of the litigation, it is not possible to estimate the amount or range of any possible loss arising from the expenditure of defense fees, a judgment or settlement of the matter.

NASDAQ Notice

On November 17, 2022, the Company received a written notice from the NASDAQ Stock Market LLC ("Nasdaq") that the Company has not been in compliance with the minimum bid price requirement set forth in Nasdaq Listing Rule 5550(a)(2) for a period of 30 consecutive business days. Nasdaq Listing Rule 5550(a)(2) requires listed securities to maintain a minimum closing bid price of \$1.00 per share, and Nasdaq Listing Rule 5810(c)(3)(A) provides that a failure to meet the minimum closing bid price requirement exists if the deficiency continues for a period of 30 consecutive business days. The Notice has no immediate effect on the listing of the Company's common stock on the Nasdaq Capital Market.

In accordance with Nasdaq Listing Rule 5810(c)(3)(A), the Company is provided a compliance period of 180 calendar days from the date of the Notice, or until May 16, 2023, to regain compliance with the minimum closing bid price requirement. If the Company does not regain compliance during the compliance period ending May 16, 2023, the Company may be afforded a second 180 calendar day period to regain compliance. To qualify for the second compliance period, the Company must (i) meet the continued listing requirement for market value of publicly-held shares and all other initial listing standards for the Nasdaq Capital Market, with the exception of the minimum closing bid price requirement and (ii) notify Nasdaq of its intent to cure the deficiency. The Company can achieve compliance with the minimum closing bid price requirement if, during either compliance period, the minimum closing bid price per share of the Company's common stock is at least \$1.00 for a minimum of 10 consecutive business days. The Company anticipates that its shares of common stock will continue to be listed and traded on the Nasdaq Capital Market during the compliance period(s).

The Company plans to carefully assess potential actions to regain compliance. However, the Company may be unable to regain compliance with the minimum closing bid price requirement during the compliance period(s), in which case the Company anticipates Nasdaq would provide a notice to the Company that its shares of common stock are subject to delisting, and the Company's common shares would thereupon be delisted.

9. Subsequent Events

On January 25, 2023, the Company's CEO, Mr. Frelick, received a stock option grant for 2022 bonus achievements whereby he is entitled to 158 shares of Common Stock of the Company as of the date of the grant. Also on January 25, 2023, the Company's CFO, Ms. Walsh, received a stock option grant for 2022 bonus achievements whereby she is entitled to 79 shares of Common Stock of the Company as of the date of the grant.

The grants were made on the condition that i) the exercise price will be the current market price on the date of the grant; and ii) the options will be issued with a two-year maturity. Any portion of this stock option grant that is not exercised on the date of termination shall be forfeited on such date of termination except: (i) in the case of Termination by the Company Without Cause; and (ii) upon a Change in Control (as defined in the Equity Incentive Plan) of the Company. To allow Mr. Frelick or Ms. Walsh to prevent or mitigate dilution of their equity interests in the Company, in connection with each financing, Mr. Frelick or Ms. Walsh shall be provided an opportunity to invest in the Company such that their interest, at their option, remains undiluted or partially diluted.

Reverse stock splits

On June 5, 2023, the Company filed an amendment to its certificate of incorporation, as amended, with the Secretary of State of the State of Delaware to effect a 1-for-30 reverse stock split of its outstanding common stock and warrants. The amendment was authorized by the Company’s stockholders on May 1, 2023, and was effective on June 5, 2023.

On December 14, 2023, the Company filed an amendment to its certificate of incorporation, as amended, with the Secretary of State of the State of Delaware to effect a 1-for-8 reverse stock split of its outstanding common stock and warrants. The amendment was authorized by the Company’s stockholders on December 12, 2023, and was effective on December 20, 2023.

All share and per share amounts have been retro-actively restated as if the reverse splits occurred at the beginning of the earliest period presented.

Bone Biologics Corporation
Condensed Consolidated Balance Sheets

	<u>September 30, 2023</u> (unaudited)	<u>December 31, 2022</u>
Assets		
Current Assets		
Cash	\$ 4,452,586	\$ 7,538,312
Prepaid expenses	<u>523,758</u>	<u>956,925</u>
Total assets	<u>\$ 4,976,344</u>	<u>\$ 8,495,237</u>
Liabilities and Stockholders' Equity		
Current Liabilities		
Accounts payable and accrued expenses	\$ 1,102,721	\$ 888,461
Warrant liability	<u>80,514</u>	<u>1,659,468</u>
Total current liabilities	<u>1,183,235</u>	<u>2,547,929</u>
Total liabilities	<u>1,183,235</u>	<u>2,547,929</u>
Commitments and Contingencies		
Stockholders' Equity		
Preferred Stock, \$0.001 par value per share; 20,000,000 shares authorized; none issued or outstanding at September 30, 2023 and December 31, 2022	-	-
Common stock, \$0.001 par value per share; 100,000,000 shares authorized; 391,854 and 63,820 shares issued and outstanding at September 30, 2023 and December 31, 2022, respectively	392	64
Additional paid-in capital	83,151,790	77,907,471
Accumulated deficit	<u>(79,359,073)</u>	<u>(71,960,227)</u>
Total stockholders' equity	<u>3,793,109</u>	<u>5,947,308</u>
Total liabilities and stockholders' equity	<u>\$ 4,976,344</u>	<u>\$ 8,495,237</u>

See accompanying notes to unaudited condensed consolidated financial statements.

Bone Biologics Corporation

Condensed Consolidated Statements of Operations

	Three Months Ended September 30, 2023	Three Months Ended September 30, 2022	Nine Months Ended September 30, 2023	Nine Months Ended September 30, 2022
	(unaudited)	(unaudited)	(unaudited)	(unaudited)
Revenues	\$ -	\$ -	\$ -	\$ -
Cost of revenues	-	-	-	-
Gross profit	-	-	-	-
Operating expenses				
Research and development	1,574,850	769,410	6,460,747	823,410
General and administrative	506,040	449,867	1,807,548	1,554,670
Total operating expenses	2,080,890	1,219,277	8,268,295	2,378,080
Loss from operations	(2,080,890)	(1,219,277)	(8,268,295)	(2,378,080)
Other expenses				
Change in fair value of warrant liability	160,645	-	867,930	-
Interest income	536	-	1,519	-
Net Loss	\$ (1,919,709)	\$ (1,219,277)	\$ (7,398,846)	\$ (2,378,080)
Loss per share – basic and diluted	\$ (4.90)	\$ (28.23)	\$ (37.40)	\$ (55.06)
Weighted average shares outstanding – basic and diluted	391,854	43,189	197,855	43,189

See accompanying notes to unaudited condensed consolidated financial statements.

Bone Biologics Corporation

Consolidated Statement of Stockholders' Equity
For the Three and Nine Months ended September 30, 2023
(unaudited)

	<u>Common Stock</u>		Additional	Accumulated	Total
	<u>Shares</u>	<u>Amount</u>	<u>Paid-in</u>	<u>Equity</u>	<u>Stockholders'</u>
			<u>Capital</u>		<u>Equity</u>
Balance at December 31, 2022	63,820	\$ 64	\$ 77,907,471	\$(71,960,227)	\$ 5,947,308
Fair value of vested stock options issued to employees and directors	-	-	44,764	-	44,764
Exercise of warrants	5,837	6	(6)	-	-
Extinguishment of warrant liability upon exercise of warrants	-	-	490,226	-	490,226
Net Loss	<u>-</u>	<u>-</u>	<u>-</u>	<u>(3,709,899)</u>	<u>(3,709,899)</u>
Balance at March 31, 2023	69,657	70	78,442,455	(75,670,126)	2,772,399
Fair value of vested stock options issued to employees and directors	-	-	16,670	-	16,670
Exercise of warrants	4,938	5	(5)	-	-
Extinguishment of warrant liability upon exercise of warrants	-	-	220,798	-	220,798
Proceeds from sale of common stock in public offering, net of offering costs \$547,837	317,259	317	4,451,846	-	4,452,163
Net Loss	<u>-</u>	<u>-</u>	<u>-</u>	<u>(1,769,238)</u>	<u>(1,769,238)</u>
Balance at June 30, 2023	391,854	392	83,131,764	(77,439,364)	5,692,792
Fair value of vested stock options issued to employees and directors	-	-	20,026	-	20,026
Net Loss	<u>-</u>	<u>-</u>	<u>-</u>	<u>(1,919,709)</u>	<u>(1,919,709)</u>
Balance at September 30, 2023	<u>391,854</u>	<u>\$ 392</u>	<u>\$ 83,151,790</u>	<u>\$(79,359,073)</u>	<u>\$ 3,793,109</u>

See accompanying notes to unaudited condensed consolidated financial statements.

Bone Biologics Corporation

Consolidated Statement of Stockholders' Equity
For the Three and Nine Months ended September 30, 2022
(unaudited)

	<u>Common Stock</u>		Additional	Accumulated	Total
	<u>Shares</u>	<u>Amount</u>	<u>Paid-in</u>	<u>Deficit</u>	<u>Stockholders'</u>
			<u>Capital</u>		<u>Equity</u>
Balance at December 31, 2021	43,189	\$ 43	\$ 77,051,020	\$(70,475,607)	\$ 6,575,456
Fair value of vested stock options issued to employees and directors	-	-	152,844	-	152,844
Net Loss	<u>-</u>	<u>-</u>	<u>-</u>	<u>(689,499)</u>	<u>(689,499)</u>
Balance at March 31, 2022	43,189	43	77,203,864	(71,165,106)	6,038,801
Fair value of vested stock options issued to employees and directors	-	-	18,748	-	18,748
Net Loss	<u>-</u>	<u>-</u>	<u>-</u>	<u>(469,304)</u>	<u>(469,304)</u>
Balance at June 30, 2022	43,189	43	77,222,612	(71,634,410)	5,588,245
Fair value of vested stock options issued to employees and directors	-	-	32,534	-	32,534
Net Loss	<u>-</u>	<u>-</u>	<u>-</u>	<u>(1,219,277)</u>	<u>(1,219,277)</u>
Balance at September 30, 2022	<u>43,189</u>	<u>\$ 43</u>	<u>\$ 77,255,146</u>	<u>\$(72,853,687)</u>	<u>\$ 4,401,502</u>

See accompanying notes to unaudited condensed consolidated financial statements.

Bone Biologics Corporation

Condensed Consolidated Statements of Cash Flows

	<u>Nine Months Ended September 30, 2023</u> (unaudited)	<u>Nine Months Ended September 30, 2022</u> (unaudited)
Cash flows from operating activities		
Net loss	\$ (7,398,846)	\$ (2,378,080)
Adjustments to reconcile net loss to net cash used in operating activities:		
Stock-based compensation	81,460	204,126
Change in fair value of warrant liability	(867,930)	-
Changes in operating assets and liabilities:		
Prepaid expenses and other current assets	433,167	(141,734)
Accounts payable and accrued expenses	214,260	699,566
Net cash used in operating activities	(7,537,889)	(1,616,122)
Cash flows from financing activities		
Proceeds from sale of common stock in public offering, net of offering costs	4,452,163	-
Net cash provided by financing activities	4,452,163	-
Net decrease in cash	(3,085,726)	(1,616,122)
Cash, beginning of period	7,538,312	6,675,365
Cash, end of period	\$ 4,452,586	\$ 5,059,243
Supplemental information		
Income taxes paid	\$ -	\$ -
Non-cash financing activities		
Extinguishment of warrant liability upon exercise of warrants	\$ 711,024	\$ -

See accompanying notes to unaudited condensed consolidated financial statements.

Bone Biologics Corporation
Notes to Unaudited Condensed Consolidated Financial Statements
For the Three and Nine Months ended September 30, 2023 and 2022

1. The Company

Bone Biologics Corporation (the “Company”) was incorporated under the laws of the State of Delaware on October 18, 2007 as AFH Acquisition X, Inc. Pursuant to a Merger Agreement, dated September 19, 2014, by and among the Company, its wholly-owned subsidiary, Bone Biologics Acquisition Corp., (“Merger Sub”), and Bone Biologics, Inc., Merger Sub merged with and into Bone Biologics Inc., with Bone Biologics Inc. remaining as the surviving corporation. On September 22, 2014, the Company changed its name to “Bone Biologics Corporation” and Bone Biologics, Inc. became a wholly owned subsidiary of the Company. Bone Biologics, Inc. was incorporated in California on September 9, 2004.

The Company is a medical device company that is currently focused on bone regeneration in spinal fusion using the recombinant human protein known as NELL-1. NELL-1 in combination with DBM, demineralized bone matrix, is an osteopromotive recombinant protein that provides target specific control over bone regeneration. The NELL-1 technology platform has been licensed exclusively for worldwide applications to the Company through a technology transfer from the UCLA Technology Development Group on behalf of UC Regents (“UCLA TDG”). UCLA TDG and the Company received guidance from the Food and Drug Administration that NELL-1/DBM will be classified as a device/drug combination product with a pre-market approval filing (“PMA”).

The production and marketing of the Company’s products and its ongoing research and development activities are subject to extensive regulation by numerous governmental authorities in the United States. Prior to marketing in the United States, any combination product developed by the Company must undergo rigorous preclinical (animal) and clinical (human) testing and an extensive regulatory approval process implemented by the FDA under the Food, Drug and Cosmetic Act. There can be no assurance that the Company will not encounter problems in clinical trials that will cause the Company or the FDA to delay or suspend clinical trials.

The Company’s success will depend in part on its ability to obtain patents and product license rights, maintain trade secrets, and operate without infringing on the proprietary rights of others, both in the United States and other countries. There can be no assurance that patents issued to or licensed by the Company will not be challenged, invalidated, rendered unenforceable, or circumvented, or that the rights granted thereunder will provide proprietary protection or competitive advantages to the Company.

Reverse stock splits

On June 5, 2023, the Company filed an amendment to its certificate of incorporation, as amended, with the Secretary of State of the State of Delaware to effect a 1-for-30 reverse stock split of its outstanding common stock and warrants. The amendment was authorized by the Company’s stockholders on May 1, 2023, and was effective on June 5, 2023.

On December 14, 2023, the Company filed an amendment to its certificate of incorporation, as amended, with the Secretary of State of the State of Delaware to effect a 1-for-8 reverse stock split of its outstanding common stock and warrants. The amendment was authorized by the Company’s stockholders on December 12, 2023, and was effective on December 20, 2023.

All share and per share amounts have been retro-actively restated as if the reverse split occurred at the beginning of the earliest period presented.

Going Concern

The Company has no significant operating history and since inception to September 30, 2023 has incurred accumulated losses of approximately \$79.4 million. The Company will continue to incur significant expenses for development activities for its product NELL-1/DBM. Operating expenditures for the next twelve months are estimated at \$5.1 million. The accompanying unaudited condensed consolidated financial statements for the nine months ended September 30, 2023, have been prepared on the basis that the Company will continue as a going concern, which contemplates realization of assets and the satisfaction of liabilities in the normal course of business. As reflected in the financial statements, during the nine months ended September 30, 2023, the Company incurred a net loss of \$7.4 million, and used net cash in operating activities of \$7.5 million. These factors raise substantial doubt about the Company’s ability to continue as a going concern within a reasonable period of time, which is considered to be one year from the issuance date of these financial statements. In addition, our independent registered public accounting firm, in its audit report to the financial statements included in our Annual Report on Form 10-K for the year ended December 31, 2022, expressed substantial doubt about our ability to continue as a going concern. The consolidated financial statements do not include any adjustments related to the recoverability and classification of recorded asset amounts or the amounts and classification of liabilities that might be necessary should the Company be unable to continue as a going concern.

At September 30, 2023, we had cash of \$4.5 million. Available cash is expected to fund our operations until the second quarter of 2024 when we expect to announce data reporting from our pilot clinical study.

We anticipate that we will require approximately \$5.9 million to complete first in man studies, and an estimated additional \$27 million to achieve FDA approval for a spine interbody fusion indication.

On June 16, 2023, the Company completed a public offering generating net proceeds to the Company of \$4.5 million.

The Company will continue to attempt to raise additional debt and/or equity financing to fund future operations and to provide additional working capital. However, there is no assurance that such financing will be consummated or obtained in sufficient amounts necessary to meet the Company’s needs. If cash resources are insufficient to satisfy the Company’s on-going cash requirements, the Company will be required to scale back or discontinue its product development programs, or obtain funds if available (although there can be no certainties) through strategic alliances that may require the Company to relinquish rights to its technology, substantially reduce or discontinue its operations entirely. No assurance can be given that any future financing will be available or, if available, that it will be on terms that are satisfactory to the Company. Even if the Company is able to obtain additional financing, it may contain

undue restrictions on our operations, in the case of debt financing, or cause substantial dilution for our stockholders, in the case of equity financing.

2. Summary of Significant Accounting Policies

Basis of Presentation

The interim condensed consolidated financial statements included herein reflect all material adjustments (consisting of normal recurring adjustments and reclassifications and non-recurring adjustments) which, in the opinion of management, are ordinary and necessary for a fair presentation of results for the interim periods. Certain information and footnote disclosures required under the accounting principles generally accepted in the United States of America (“GAAP”) have been condensed or omitted pursuant to the rules and regulations of the Securities and Exchange Commission (the “SEC”). The Company believes that the disclosures are adequate to make the information presented not misleading. The condensed consolidated balance sheet information as of December 31, 2022 was derived from the audited consolidated financial statements included in the Company’s Annual Report on Form 10-K filed with the SEC on March 30, 2023 (the “2022 Annual Report”). These condensed consolidated financial statements should be read in conjunction with the Company’s audited financial statements for the year ended December 31, 2022 and notes thereto included in the 2022 Annual Report.

The results of operations for the nine months ended September 30, 2023 are not necessarily indicative of the results to be expected for the entire fiscal year ended December 31, 2023 or for any other period.

Use of Estimates

The preparation of the accompanying consolidated financial statements in conformity with GAAP requires management to make certain estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the consolidated financial statements and reported amounts of expenses during the reporting period.

Significant estimates include the assumptions used in the accrual for potential liabilities, the valuation of the warrant liability, the valuation of debt and equity instruments, the valuation of stock options and warrants issued for services, and deferred tax valuation allowances. Actual results could differ from those estimates.

Inflation

Macroeconomic factors such as inflation, rising interest rates, governmental responses there to and possible recession caused thereby also add significant uncertainty to our operations and possible effects to the amount and type of financing available to the Company in the future.

Cash

Cash primarily consists of bank demand deposits maintained by a major financial institution. The Company’s policy is to maintain its cash balances with financial institutions with high credit ratings and in accounts insured by the Federal Deposit Insurance Corporation (the “FDIC”) and/or by the Securities Investor Protection Corporation (the “SIPC”). The Company may periodically have cash balances in financial institutions in excess of the FDIC and SIPC insurance limits of \$250,000 and \$500,000, respectively. The Company has not experienced any losses to date resulting from this policy.

Fair Value of Financial Instruments

Accounting standards require certain assets and liabilities be reported at fair value in the financial statements and provide a framework for establishing that fair value. The Company defines fair value as the exchange price that would be received for an asset or paid to transfer a liability (an exit price) in the principal or most advantageous market for the asset or liability in an orderly transaction between market participants on the measurement date. Valuation techniques used to measure fair value must maximize the use of observable inputs and minimize the use of unobservable inputs. The fair value hierarchy is based on three levels of inputs that may be used to measure fair value, of which the first two are considered observable and the last is considered unobservable:

Level 1: Quoted prices in active markets for identical assets or liabilities.

Level 2: Inputs other than Level 1 that are observable, either directly or indirectly, such as quoted prices for similar assets or liabilities; quoted prices in markets that are not active; or other inputs that are observable or can be corroborated by observable market data for substantially the full term of the assets or liabilities.

Level 3 assumptions: Unobservable inputs that are supported by little or no market activity and that are significant to the fair value of the assets or liabilities including liabilities resulting from embedded derivatives associated with certain warrants to purchase common stock.

The fair value of financial instruments measured on a recurring basis was as follows as of September 30, 2023:

Description	As of September 30, 2023			
	Total	Level 1	Level 2	Level 3
Liabilities:				
Warrant liability	\$ 80,514	—	—	\$ 80,514
Total liabilities at fair value	\$ 80,514	—	—	\$ 80,514

The following table provides a roll-forward of the warrant liability measured at fair value on a recurring basis using unobservable level 3 inputs for the nine period ended September 30, 2023 as follows:

	September 30, 2023
Warrant liability	
Balance as of beginning of period – December 31, 2022	\$ 1,659,468
Extinguishment of warrant liability upon exercise of warrants	(711,024)
Change in fair value	(867,930)
Balance as of September 30, 2023	\$ 80,514

The Company believes the carrying amount of certain financial instruments, including cash and accounts payable approximate their values based on their short-term nature and are excluded from the fair value tables above.

Prepaid Expenses

At September 30, 2023, prepaid expenses consist of prepaid insurance and prepaid services. Prepaid expenses are amounts paid to secure the use of assets or the receipt of services at a future date or continuously over one or more future periods. When the prepaid expenses are eventually consumed, they are charged to expense. The Company had \$523,758 and \$956,925 in prepaid expenses as of September 30, 2023 and December 31, 2022, respectively.

Stock Based Compensation

ASC 718, *Compensation – Stock Compensation*, prescribes accounting and reporting standards for all share-based payment transactions to employees and non-employees. Transactions include incurring liabilities, or issuing or offering to issue shares, options, and other equity instruments such as employee stock ownership plans and stock appreciation rights. Share-based payments to employees, including grants of employee stock options, are recognized as compensation expense in the consolidated financial statements based on their fair values. That expense is recognized over the period during which an employee is required to provide services in exchange for the award, known as the requisite service period (usually the vesting period). Recognition of compensation expense for non-employees is in the same period and manner as if the Company had paid cash for the services.

Loss per Common Share

Basic loss per share is computed by dividing the loss available to common shareholders by the weighted-average number of common shares outstanding during the period. Diluted loss per share is computed similar to basic loss per share except that the denominator is increased to include the number of additional common shares that would have been outstanding if the potential common shares had been issued and if the additional common shares were dilutive. Diluted loss per common share reflects the potential dilution that could occur if options and warrants were to be exercised or converted or otherwise resulted in the issuance of common stock that then shared in the earnings of the entity.

Since the effects of outstanding options and warrants are anti-dilutive for the nine months ended September 30, 2023 and 2022, shares of common stock underlying these instruments have been excluded from the computation of loss per common share.

The following sets forth the number of shares of common stock underlying outstanding options and warrants as of September 30, 2023 and 2022:

	September 30,	
	2023	2022
Warrants	46,917	7,620
Stock options	34,310	1,910
	81,227	9,530

New Accounting Standards

The Company’s management has evaluated all the recently issued, but not yet effective, accounting standards and guidance that have been issued or proposed by the FASB or other standards-setting bodies through the filing date of these financial statements and does not believe the future adoption of any such pronouncements will have a material effect on the Company’s financial position and results of operations.

3. Warrant Liability

In October 2022, the Company completed a public equity offering, which included the issuance of 54,174 warrants. Upon the occurrence of certain transactions (“Fundamental Transactions,” as defined in the warrant agent agreement), the warrants provide for a value determined using a Black Scholes model with inputs calculated as described in the warrant agreement which includes a 100% floor on the volatility input to be utilized. The Company has determined that this provision introduces leverage to the holders of the warrants that could result in a value that would be greater than the settlement amount of a fixed-for-fixed option on the Company’s own equity shares. Accordingly, pursuant to ASC 815, the Company has classified the fair value of the warrants as a liability to be re-measured at the end of every reporting period with the change in value reported in the statement of operations.

The warrant liability was valued at the following dates using a Black-Scholes model with the following assumptions:

	September 30, 2023	December 31, 2022
Warrant liability:		
Risk-free interest rate	4.74%	4.26%
Expected volatility	134.17%	112.58%
Expected life (in years)	4.03	4.78
Expected dividend yield	-	-
Fair Value of warrant liability	\$ 80,514	\$ 1,659,468

The risk-free rate is based on the U.S. Treasury yield curve in effect at the time of grant. We determine expected volatility based upon the historical volatility of our common stock since listing on The Nasdaq Capital Market. We do not believe that the future volatility of our common stock over an option’s expected term is likely to differ significantly from the past. The expected term of the warrants granted are determined based on the duration of time the warrants are expected to be outstanding. The dividend yield on the Company’s warrants is assumed to be zero as the Company has not historically paid dividends.

4. Stockholders’ Equity

Preferred Stock

The Company’s amended and restated certificate of incorporation authorizes the Company to issue a total of 20,000,000 shares of preferred stock. No shares have been issued as of September 30, 2023 and December 31, 2022.

Common Stock

The Company’s amended and restated certificate of incorporation authorizes the Company to issue a total of 100,000,000 shares of common stock. As of September 30, 2023 and December 31, 2022, the Company had an aggregate of 391,854 and 63,820 shares of common stock outstanding, respectively.

In February 2023, 5,837 Series C warrants were exchanged for 5,837 shares of common stock.

In May 2023, 4,938 Series C warrants were exchanged for 4,938 shares of common stock.

On June 14, 2023, the Company entered into an underwriting agreement (the “Underwriting Agreement”) with EF Hutton, division of Benchmark Investments, LLC (“EF Hutton”) acting as representatives of the several underwriters in connection with a public offering (the “Offering”) of an aggregate of 317,259 shares of its common stock. The public offering price was \$15.76 per share and the underwriters agreed to purchase 317,259 shares at a 7% discount to the public offering price. The Company granted EF Hutton a 45-day option to purchase up to 47,589 additional shares, to cover over-allotments, if any, which was not exercised. The Offering closed on June 16, 2023, resulting in gross proceeds of \$5 million, before deducting underwriting discounts and commissions and other offering expenses. The net proceeds in relation to the Offering were \$4,452,163.

5. Common Stock Warrants

A summary of warrant activity for the nine months ended September 30, 2023 is presented below:

Subject to Exercise	Number of Warrants	Weighted Average Exercise Price	Weighted Average Life (Years)
Outstanding as of December 31, 2022	57,692	\$ 427.20	4.65
Granted – 2023	-	-	-
Forfeited/Expired – 2023	-	-	-
Exercised – 2023	(10,775)	-	4.29
Outstanding as of September 30, 2023	46,917	\$ 525.28	3.87

As of September 30, 2023, the Company had outstanding vested and unexercised Common Stock Warrants as follows:

Date Issued	Exercise Price	Number of Warrants	Expiration date
October 2021	\$ 1,512.00	7,620	October 13, 2026
October 2022	\$ 388.80	18,058	October 12, 2027
October 2022	\$ 324.00	18,846	October 12, 2027
October 2022	\$ 0.00	2,393	October 12, 2027
Total outstanding warrants at September 30, 2023		46,917	

Based on a fair market value of \$5.68 per share on September 30, 2023, there 2,393 exercisable but unexercised in-the-money common stock warrants on that date. Accordingly, the intrinsic value attributed to exercisable but unexercised common stock warrants at September 30, 2023 was \$13,587.

6. Stock-based Compensation

2015 Equity Incentive Plan

The Company has 629,489 shares of Common Stock authorized and reserved for issuance under our 2015 Equity Incentive Plan for option awards. This reserve may be increased by the Board each year by up to the number of shares of stock equal to 5% of the number of shares of stock issued and outstanding on the immediately preceding December 31. In September 2023, the Company’s stockholders approved an amendment to the 2015 Equity Incentive Plan that, among other items, increased the number of shares available under the 2015 Equity Incentive Plan by 625,000 shares. Appropriate adjustments were made in the number of authorized shares and other numerical limits in our 2015 Equity Incentive Plan and in outstanding awards to prevent dilution or enlargement of participants’ rights in the event of a stock split or other change in our capital structure. Shares subject to awards granted under our 2015 Equity Incentive Plan which expire, are repurchased or are cancelled or forfeited will again become available for issuance under our 2015 Equity Incentive Plan. The shares available will not be reduced by awards settled in cash. Shares withheld to satisfy tax withholding obligations will not again become available for grant. The gross number of shares issued upon the exercise of stock appreciation rights or options exercised by means of a net exercise or by tender of previously owned shares will be deducted from the shares available under our 2015 Equity Incentive Plan.

Awards may be granted under our 2015 Equity Incentive Plan to our employees, including officers, director or consultants, and our present or future affiliated entities. While we may grant incentive stock options only to employees, we may grant non-statutory stock options, stock appreciation rights, restricted stock purchase rights or bonuses, restricted stock units, performance shares, performance units and cash-based awards or other stock based awards to any eligible participant.

The 2015 Equity Incentive Plan is administered by our compensation committee. Subject to the provisions of our 2015 Equity Incentive Plan, the compensation committee determines, in its discretion, the persons to whom, and the times at which, awards are granted, as well as the size, terms and conditions of each award. All awards are evidenced by a written agreement between us and the holder of the award. The compensation committee has the authority to construe and interpret the terms of our 2015 Equity Incentive Plan and awards granted under our 2015 Equity Incentive Plan.

A summary of stock option activity for the nine months ended September 30, 2023 is presented below:

Subject to Exercise	Number of Options	Weighted Average Exercise Price	Weighted Average Life (Years)	Aggregate Intrinsic Value
Outstanding as of December 31, 2022	1,910	\$ 4,041.60	5.60	\$ -
Granted – 2023	32,400	5.44	9.94	18,010
Forfeited/Expired – 2023	-	-	-	-
Exercised – 2023	-	-	-	-
Outstanding as of September 30, 2023	34,310	\$ 232.64	8.62	\$ 18,010
Options vested and exercisable at September 30, 2023	2,124	\$ 3,677.60	4.32	\$ -

As of September 30, 2023, the Company had outstanding stock options as follows:

Date Issued	Exercise Price	Number of Options	Expiration date
August 2015	\$ 9,540.00	174	December 27, 2025
September 2015	\$ 9,540.00	36	December 27, 2025
November 2015	\$ 9,540.00	205	December 27, 2025
December 2015	\$ 9,540.00	12	December 27, 2025
January 2016	\$ 9,540.00	213	January 9, 2026
May 2016	\$ 12,300.00	45	May 26, 2026
September 2016	\$ 12,300.00	21	May 31, 2026
January 2017	\$ 12,300.00	10	January 1, 2027
January 2018	\$ 11,820.00	8	January 1, 2028
January 2019	\$ 564.00	92	January 1, 2029
October 2021	\$ 1,260.00	207	October 26, 2031
January 2022	\$ 844.80	111	January 1, 2032
January 2022	\$ 892.80	209	January 1, 2024
January 2022	\$ 892.80	105	January 3, 2024
August 2022	\$ 387.26	462	August 23, 2032
January 2023	\$ 57.60	237	January 25, 2025
September 2023	\$ 5.12	32,163	September 12, 2033
Total outstanding options at September 30, 2023		34,310	

Based on a fair value of \$0.71 per share on September 30, 2023. There were no exercisable but unexercised in-the-money common stock warrants on that date.

There were 32,400 options granted during the nine months ended September 30, 2023 with a fair value of \$161,948. Vesting of options differs based on the terms of each option. During the nine months ended September 30, 2023 and 2022, the Company had stock-based compensation expense of \$81,460 and \$204,126, respectively, related to the vesting of stock options granted to the Company’s employees and directors included in our reported net loss. Our policy is to account for forfeitures of the unvested portion of option grants when they occur; therefore, these forfeitures are recorded as a reversal to expense, which can result in a credit balance in the statement of operations.

The Company utilized the Black-Scholes option-pricing model. The assumptions used for the nine months ended September 30, 2023 are as follows:

	September 30, 2023
Risk free interest rate	4.39%
Expected Volatility	135.49%
Expected life (in years)	5.86
Expected dividend yield	0%

The expected volatility is a measure of the amount by which our stock price is expected to fluctuate during the expected term of options granted. We determine the expected volatility based upon the historical volatility of our common stock since listing on The Nasdaq Capital Market. We do not believe that the future volatility of our common stock over an option’s expected term is likely to differ significantly from the past. The risk-free interest rate used in the calculations is based on the implied yield available on U.S. Treasury issues with an equivalent term approximating the expected life of the options as calculated using the simplified method. The expected life of the options used was based on the contractual life of the option granted. Stock-based compensation is a non-cash expense because we settle these obligations by issuing shares of our common stock from our authorized shares instead of settling such obligations with cash payments.

As of September 30, 2023, total unrecognized compensation cost related to unvested stock options was \$135,445. The cost is expected to be recognized over a weighted average period of 0.38 years.

7. Commitments and Contingencies

UCLA TDG Exclusive License Agreement

Effective April 9, 2019, we entered into an Amended and Restated Exclusive License Agreement dated as of March 21, 2019, which was subsequently amended through three sets of amendments (as so amended the “Amended License Agreement”) with the UCLA TDG. The Amended License Agreement amends and restates the Amended and Restated Exclusive License Agreement, dated as of June 19, 2017 (the “2017 Agreement”). The 2017 Agreement amended and restated the Exclusive License Agreement, effective March 15, 2006, between the Company and UCLA TDG, as amended by ten amendments. Under the terms of the Amended License Agreement, the Regents have continued to grant us exclusive rights to develop and commercialize NELL-1 (the “Licensed Product”) for spinal fusion by local administration, osteoporosis and trauma applications. The Licensed Product is a recombinant human protein growth factor that is essential for normal bone development.

We have agreed to pay an annual maintenance fee to UCLA TDG of \$10,000 as well as pay certain royalties to UCLA TDG under the Amended License Agreement at the rate of 3.0% of net sales of licensed products or licensed methods. We must pay the royalties to UCLA TDG on a quarterly basis. Upon a first commercial sale, we also must pay a minimum annual royalty between \$50,000 and \$250,000, depending on the calendar year which is after the first commercial sale. If we are required to pay any third party any royalties as a result of us making use of UCLA TDG patents, then we may reduce the royalty owed to UCLA TDG by 0.333% for every percentage point paid to a third party. If we grant sublicense rights to a third party to use the UCLA TDG patent, then we will pay UCLA TDG 10% to 20% of the sublicensing income we receive from such sublicense.

We are obligated to make the following milestone payments to UCLA TDG for each Licensed Product or Licensed Method:

- \$100,000 upon enrollment of the first subject in a Feasibility Study;
- \$250,000 upon enrollment of the first subject in a Pivotal Study;
- \$500,000 upon Pre-Market Approval of a Licensed Product or Licensed Method; and
- \$1,000,000 upon the First Commercial Sale of a Licensed Product or Licensed Method.

We are also obligated pay to UCLA TDG a fee (the “Diligence Fee”) of \$8,000,000 upon the sale of any Licensed Product (the “Triggering Sale Date”) in accordance with the payment schedule below:

- Due upon cumulative Net Sales equaling \$50,000,000 following the Triggering Sale Date - \$2,000,000;
- Due upon cumulative Net Sales equaling \$100,000,000 following the Triggering Sale Date - \$2,000,000; and
- Due upon cumulative Net Sales equaling \$200,000,000 following the Triggering Sale Date - \$4,000,000.

Our obligation to pay the Diligence Fee will survive termination or expiration of the Amended License Agreement and we are prohibited from assigning, selling, or otherwise transferring any of its assets related to any Licensed Product unless our Diligence Fee obligation is assigned, sold, or transferred along with such assets, or unless we pay UCLA TDG the Diligence Fee within ten (10) days of such assignment, sale or other transfer of such rights to any Licensed Product.

We are also obligated to pay UCLA TDG a cash milestone payment within thirty (30) days of a Liquidity Event (including a Change of Control Transaction and a payment election by UCLA TDG exercisable after December 22, 2016) such payment to equal the greater of:

- \$500,000; or
- 2% of all proceeds in connection with a Change of Control Transaction.

As of September 30, 2023, none of the above milestones have been met.

We are obligated to diligently proceed with developing and commercializing licensed products under UCLA TDG patents set forth in the Amended License Agreement. We are required to meet certain diligence milestone deadlines pursuant to the Amended License Agreement. Applicable for the current year, we are required to spend at least \$1,000,000 per calendar year on pre-clinical or clinical development until the date that we complete a Phase III pivotal study. If we fail to meet this or the other diligence milestone deadlines, UCLA TDG has the right to either terminate the license or reduce the license to a non-exclusive license.

We must reimburse or pre-pay UCLA TDG for patent prosecution and maintenance costs incurred during the term of the Amended License Agreement. We have the right to bring infringement actions against third party infringers of the Amended License Agreement, UCLA TDG may join voluntarily, at its own expense, or, at our expense, be joined involuntarily to the action. We are required to indemnify UCLA TDG against any third party claims arising out of our exercise of the rights under the Amended License Agreement or any sublicense.

Payments to UCLA TDG under the Amended License Agreement for the nine months ended September 30, 2023 and 2022 were \$23,238 and \$35,235, respectively.

Development Contracts

The Company has two contracts with one vendor for development activities of NELL-1. As of September 30, 2023, there were no prepaid expenses and \$955,076 in accounts payable for this vendor. Amounts remaining for services contained within the contracts was \$487,640 as of September 30, 2023.

At September 30, 2023 there exists a concentration of payables to one vendor of approximately 98% of the Company's payables.

Contingencies

The Company is subject to claims and assessments from time to time in the ordinary course of business. The Company's management does not believe that any such matters, individually or in the aggregate, will have a material adverse effect on the Company's business, financial condition, results of operations or cash flows.

In July 2019, Dr. Bessie (Chia) Soo and Dr. Kang (Eric) Ting ("Plaintiffs") filed a complaint (the "Complaint") in federal court in Massachusetts against the Company, Bruce Stroeve ("Stroeve"), John Booth ("Booth"), Stephen LaNeve ("LaNeve", and together with Stroeve and Booth, the "Individual Defendants"), and MTF Biologics (f/k/a The Musculoskeletal Transplant Foundation, Inc.) ("MTF"). The Complaint alleges claims for breach of contract against the Company and tortious interference with contract against the Individual Defendants and MTF arising from the termination of the Professional Service Agreements, dated as of January 8, 2016, between the Company and each of the Plaintiffs. The Individual Defendants have been sued for actions taken by them in connection with their service to the Company as directors and/or officers of the Company. As such, the Company has certain indemnification obligations to the Individual Defendants. The Company and the Individual Defendants intend to vigorously defend against the allegations in the Complaint. Although the Complaint was filed several years ago, due to the Covid-19 Pandemic and long delays in the court ruling on various motions to dismiss, in terms of case progression the case is still in its early stages with the claims in the case not being set until April 2022 and preliminary discovery starting since then. Based on the early stage of the litigation, it is not possible to estimate the amount or range of any possible loss arising from the expenditure of defense fees, a judgment or settlement of the matter.

NASDAQ Notices

On November 17, 2022, the Company received a deficiency letter from The Nasdaq Stock Market LLC's ("Nasdaq") notifying it that, because the bid price of its common stock closed below \$1.00 per share for 30 consecutive business days, it was no longer in compliance with Nasdaq's minimum bid price rule, which is a requirement for continued listing on the Nasdaq Capital Market. On June 28, 2023, the Company received a letter from Nasdaq confirming the decision of a Nasdaq Hearings Panel, that while the Company demonstrated compliance with the minimum bid price at that time, based on its recent bid price history the panel imposed a "Panel Monitor," as defined by Nasdaq Listing Rule 5815(d)(4)(A), through June 27, 2024.

On September 27, 2023, the Company received a written notice (the "Notice") from the staff of Nasdaq notifying the Company that it failed to comply with the \$1.00 per share minimum bid price requirement set forth in Nasdaq Listing Rule 5550(a)(2). As a result of the imposition of a mandatory Panel Monitor, the Company is not eligible for a compliance period to regain compliance with the minimum bid price requirement. Accordingly, the Nasdaq staff has determined to delist the Company's securities from Nasdaq (the "Staff Determination").

The Company timely requested a hearing before a Nasdaq Hearings Panel (the "Panel"), to appeal the Staff Determination, which request stayed any delisting action pending the issuance of the Panel's determination. The Panel hearing is scheduled for November 30, 2023.

At the hearing, the Company expects to present its plan for regaining and sustaining compliance with all applicable requirements for continued listing on The Nasdaq Capital Market. There can be no assurance that the Panel will grant the Company any additional time to regain compliance or that the Company will ultimately regain and sustain compliance for listing of its securities on Nasdaq. In the event the Company's securities are delisted from Nasdaq, the Company expects that its securities should be eligible to trade on the over-the-counter OTC Markets platform. The Company is evaluating several alternatives to regain compliance with the minimum bid price requirement.

8. Subsequent Events

On November 20, 2023, the Company sold in a registered direct offering 142,384 shares of the Company's common stock at an offering price of \$5.12 per share. The Company received net proceeds of \$591,998, after deducting placement agent fees and estimated offering expenses payable by the Company. In a concurrent private placement, the Company has also issued unregistered warrants to purchase up to an aggregate of 142,384 shares of common stock. The warrants are immediately exercisable at an exercise price of \$4.16 per share and expire on May 21, 2029. In addition, the Company issued the placement warrants to purchase up to an aggregate of 8,543 shares of common stock (equal to 6.0% of the aggregate number of shares sold). The placement agent warrants have a term of five years and an exercise price of \$6.40 per share.

On January 10, 2024, the Company entered into a Settlement Agreement and Mutual General Release (the "Agreement") with Drs. Bessie (Chia) Soo and Kang (Eric) Ting, effective as of January 9, 2024, on the one hand (the "plaintiffs"), and Stephen LaNeve on the other hand (together with the Company, the "defendants"), in settlement of the claims for breach of contract and tortious interference with contract against the defendants filed in the United States District Court for the District of Massachusetts (the "Court") as previously described in the Company's periodic reports under the Securities Exchange Act of 1934, as amended. The Company had certain indemnification obligations to Mr. LaNeve arising out of actions taken in connection with his service to the Company. Under the Agreement, the Company will pay the plaintiffs \$750,000. The Company's insurance carrier's portion of the claim is \$400,000 less certain retention amounts. The parties to the Agreement filed a joint stipulation to dismiss the action with prejudice with the Court and the Company expects the action to be dismissed by the Court.

On January 8, 2024, the Company's Board of Directors appointed Robert E. Gagnon to the Board of Directors. Erick Lucera resigned from the Board of Directors on December 27, 2023, effective as of the date Mr. Gagnon was appointed. Mr. Gagnon received

an initial director grant whereby he is entitled to 9 shares of Common Stock of the Company under the Bone Biologics Corporation 2015 Equity Incentive Plan, that vests and becomes exercisable on the date of the next annual meeting of the stockholders of the Company following the grant date and an annual director grant whereby he is entitled to 8,006 shares of Common Stock of the Company under the Bone Biologics Corporation 2015 Equity Incentive Plan, 2,003 options are immediately exercisable with the remaining 6,003 options vesting and becoming exercisable in three equal installments on 3/12/2024, 6/12/2024, and 9/12/2024.

On January 17, 2024, the Company’s CEO, Mr. Frelick, received a stock option grant for 2023 bonus achievements whereby he is entitled to 25,000 shares of Common Stock of the Company as of the date of the grant. Also on January 17, 2024, the Company’s CFO, Ms. Walsh, received a stock option grant for 2023 bonus achievements whereby she is entitled to 12,500 shares of Common Stock of the Company as of the date of the grant.

The grants were made on the condition that i) the exercise price will be the current market price on the date of the grant; and ii) the options will be issued with a two-year maturity. Any portion of this stock option grant that is not exercised on the date of termination shall be forfeited on such date of termination except: (i) in the case of Termination by the Company Without Cause; and (ii) upon a Change in Control (as defined in the Equity Incentive Plan) of the Company. To allow Mr. Frelick or Ms. Walsh to prevent or mitigate dilution of their equity interests in the Company, in connection with each financing, Mr. Frelick or Ms. Walsh shall be provided an opportunity to invest in the Company such that their interest, at their option, remains undiluted or partially diluted.

Reverse stock splits

On December 14, 2023, the Company filed an amendment to its certificate of incorporation, as amended, with the Secretary of State of the State of Delaware to effect a 1-for-8 reverse stock split of its outstanding common stock and warrants. The amendment was authorized by the Company’s stockholders on December 12, 2023, and was effective on December 20, 2023.

All share and per share amounts have been retro-actively restated as if the reverse split occurred at the beginning of the earliest period presented.

BONE BIOLOGICS CORPORATION

Up to Shares of Common Stock

Up to Prefunded Warrants to purchase up to Shares of Common Stock

Up to Shares of Common Stock underlying the Prefunded Warrants

Up to Common Warrants to purchase up to Shares of Common Stock

Up to Shares of Common Stock underlying the Common Warrants

Up to Placement Agent Warrants to Purchase up to Shares of Common Stock

Up to Shares of Common Stock Underlying the Placement Agent Warrants

Prospectus

PART II — INFORMATION NOT REQUIRED IN PROSPECTUS

Item 13. Other Expenses of Issuance and Distribution

The following table sets forth all expenses, other than the placement agent fees, payable by the registrant in connection with the sale of the securities being registered. All the amounts shown are estimates except the SEC registration fee and the FINRA filing fee.

	Amount to be paid
SEC registration fee	\$ 1,531.35
FINRA filing fee	2,056.25
Transfer agent and registrar fees	20,000
Accounting fees and expenses	25,000
Legal fees and expenses	120,000
Printing and engraving expenses	15,000
Miscellaneous	-
Total	<u>\$ 183,587.60</u>

Item 14. Indemnification of Directors and Officers

Section 102 of the DGCL permits a corporation to eliminate the personal liability of directors of a corporation to the corporation or its stockholders for monetary damages for a breach of fiduciary duty as a director, except where the director breached his duty of loyalty to us or our stockholders, acted or failed to act (an omission) not in good faith or that involved intentional misconduct or a knowing violation of law, engaged in intentional misconduct or knowingly violated a law, authorized the payment of a dividend or approved a stock repurchase in violation of the DGCL, or obtained an improper personal benefit. Our Amended and Restated Certificate of Incorporation, as amended (“Certificate of Incorporation”) provides that no director of the Company shall be personally liable to it or its stockholders for monetary damages for any breach of fiduciary duty as a director, notwithstanding any provision of law imposing such liability, except to the extent that the DGCL prohibits the elimination or limitation of liability of directors for breaches of fiduciary duty.

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

Our Certificate of Incorporation and Amended and Restated Bylaws provide indemnification for our directors and officers to the fullest extent permitted by the DGCL. We will indemnify each person who was or is a party or threatened to be made a party to any threatened, pending or completed action, suit or proceeding (other than an action by or in the right of us) by reason of the fact that he or she is or was, or has agreed to become, a director or officer, or is or was serving, or has agreed to serve, at our request as a director, officer, partner, employee or trustee of, or in a similar capacity with, another corporation, partnership, joint venture, trust or other enterprise (all such persons being referred to as an “Indemnitee”), or by reason of any action alleged to have been taken or omitted in such capacity, against all expenses (including attorneys’ fees), judgments, fines and amounts paid in settlement actually and reasonably incurred in connection with such action, suit or proceeding and any appeal therefrom, if such Indemnitee acted in good faith and in a manner he or she reasonably believed to be in, or not opposed to, our best interests, and, with respect to any criminal action or proceeding, he or she had no reasonable cause to believe his or her conduct was unlawful. Our Certificate of Incorporation and Amended and Restated Bylaws provide that we will indemnify any Indemnitee who was or is a party to an action or suit by or in the right of us to procure a judgment in our favor by reason of the fact that the Indemnitee is or was, or has agreed to become, a director or officer, or is or was serving, or has agreed to serve, at our request as a director, officer, partner, employee or trustee of, or in a similar capacity with, another corporation, partnership, joint venture, trust or other enterprise, or by reason of any action alleged to have been taken or omitted in such capacity, against all expenses (including attorneys’ fees) and, to the extent permitted by law, amounts paid in settlement actually and reasonably incurred in connection with such action, suit or proceeding, and any appeal therefrom, if the Indemnitee acted in good faith and in a manner he or she reasonably believed to be in, or not opposed to, our best interests, except that no indemnification shall be made with respect to any claim, issue or matter as to which such person shall have been adjudged to be liable to us, unless a court determines that, despite such adjudication but in view of all of the circumstances, he or she is entitled to indemnification of such expenses. Notwithstanding the foregoing, to the extent that any Indemnitee has been successful, on the merits or otherwise, he or she will be indemnified by us against all expenses (including attorneys’ fees) actually and reasonably incurred in connection therewith. Expenses must be advanced to an Indemnitee under certain circumstances.

As of the date of this prospectus, we have entered into separate indemnification agreements with each of our directors and executive officers. Each indemnification agreement provides, among other things, for indemnification to the fullest extent permitted by law and our Certificate of Incorporation against any and all expenses, judgments, fines, penalties and amounts paid in settlement of any claim. The indemnification agreements provide for the advancement or payment of all expenses to the indemnitee and for the reimbursement to us if it is found that such indemnitee is not entitled to such indemnification. In addition, we have obtained a general liability insurance policy that covers certain liabilities of directors and officers of our corporation arising out of claims based on acts or omissions in their capacities as directors or officers.

Item 15. Recent Sales of Unregistered Securities

The information below lists all of the securities sold by us during the past three years which were not registered under the Securities Act:

- On November 16, 2023, we sold registered shares of common stock in a registered direct offering and contemporaneously therewith sold unregistered warrants to purchase up to an aggregate of 142,384 shares of our common stock in a private placement, to certain institutional investors, for approximately \$729,000. The warrants were sold in reliance on the exemptions from registration provided by Section 4(a)(2) under the Securities Act and/or Regulation D promulgated thereunder.
- On November 16, 2023, we issued warrants to purchase up to an aggregate of 8,543 shares of our common stock to H.C. Wainwright (equal to 6.0% of the aggregate number of shares of common stock sold in a registered direct offering) in connection with the services it provided as placement agent in the registered direct offering and private placement, in reliance on the exemptions from registration provided by Section 4(a)(2) under the Securities Act and/or Regulation D promulgated thereunder.

Item 16. Exhibits and Financial Statement Schedules

The following exhibits to this registration statement included in the Exhibit Index are incorporated by reference.

EXHIBIT INDEX

Exhibit Number	Exhibit Title	Incorporated by reference (unless otherwise indicated)			
		Form	File	Exhibit	Filing date
2.1	Agreement and Plan of Merger, dated as of September 19, 2014, by and among AFH Acquisition X, Inc., Bone Biologics Acquisition Corp., and Bone Biologics, Inc.	8-K	000-53078	2.1	September 25, 2014
2.2	Certificate of Merger as filed with the California Secretary of State effective September 19, 2014	8-K	000-53078	2.2	September 25, 2014
3.1	Amended and Restated Certificate of Incorporation of Bone Biologics Corporation	8-K	000-53078	3.1(i)	September 25, 2014
3.2	Certificate of Amendment to Amended and Restated Certificate of Incorporation of Bone Biologics Corporation	8-K	000-53078	3.1	October 15, 2021
3.3	Certificate of Amendment to Amended and Restated Certificate of Incorporation of Bone Biologics Corporation	8-K	001-40899	3.1	June 6, 2023
3.4	Certificate of Amendment to Amended and Restated Certificate of Incorporation of Bone Biologics Corporation	8-K	001-40899	3.1	December 18, 2023
3.5	Amended and Restated Bylaws of Bone Biologics Corporation	8-K	001-40899	3.1	March 8, 2022
3.6	Amendment No. 1 to the Amended and Restated Bylaws of Bone Biologics Corporation	8-K	001-40899	3.1	October 24, 2023
4.1	Warrant Agent Agreement between the Company and Equiniti Trust Company dated as of October 13, 2021	8-K	000-53078	4.1	October 15, 2021
4.2*	Form of Warrant (October 2021)	—	—	—	—
4.3	Form of Representative’s Warrant (October 2021)	8-K	000-53078	1.1	October 15, 2021

4.4	Warrant Agent Agreement between the Company and Equiniti Trust Company dated as of October 7, 2022	8-K	001-40899	4.1	October 11, 2022
4.5*	Form of Series A Warrant (October 2022)	—	—	—	—
4.6*	Form of Series B Warrant (October 2022)	—	—	—	—
4.7*	Form of Series C Warrant (October 2022)	—	—	—	—
4.8	Form of Representative’s Warrant (October 2022)	8-K	001-40899	1.1	October 11, 2022
4.9	Form of Warrant (November 2023)	S-3	333-276412	4.1	January 5, 2024
4.10	Form of Placement Agent Warrant (November 2023)	8-K	001-40899	4.2	November 20, 2023
4.11**	Form of Warrant	—	—	—	—
4.12**	Form of Pre-Funded Warrant	—	—	—	—
4.13**	Form of Placement Agent Warrant (included in Exhibit 1.1)	—	—	—	—
5.1**	Opinion of Harter Secrest & Emery LLP	—	—	—	—
10.1+	Director Offer Letter, dated July 1, 2014, by and between Bruce Stroeveer and Bone Biologics Corporation	8-K	000-53078	10.4	September 25, 2014
10.2*+	Form of Indemnification Agreement	—	—	—	—
10.3+	Chief Operating Officer Employment agreement, dated June 8, 2015, by and between Bone Biologics Corporation and Jeffrey Frelick	10-Q	000-53078	10.2	August 14, 2015
10.4+	Employment Agreement dated December 17, 2021 between the Company and Deina Walsh	8-K	001-40899	10.1	December 22, 2021
10.5+	Form of Professional Services Agreement, dated January 8, 2016, by and between the Company and the Founders	8-K	000-53078	10.1	January 11, 2016
10.6+	Bone Biologics Corporation Non-Employee Director Compensation Policy	8-K	000-53078	10.1	January 4, 2016
10.7+	Bone Biologics Corporation 2015 Equity Incentive Plan	8-K	000-53078	10.3	January 4, 2016
10.8+	First Amendment to the Bone Biologics Corporation 2015 Equity Incentive Plan	Schedule 14A	001-40899	Appendix B	August 3, 2023
10.9+	Form of Stock Option Grant Notice and Option Agreement for the Bone Biologics Corporation 2015 Equity Incentive Plan	8-K	000-53078	10.4	January 4, 2016
10.10+	Form of Restricted Stock Unit Grant Notice and Restricted Stock Unit Agreement	8-K	000-53078	10.5	January 4, 2016
10.11	Option Agreement for the Distribution and Supply of Sygnal™ dated as of February 24, 2016	8-K	000-53078	10.3	February 26, 2016
10.12	Amended and Restated Exclusive License Agreement, dated as of March 21, 2019, by and between the Company and The Regents of the University of California	8-K	000-53078	10.1	April 16, 2019

10.13	First Amendment to the Amended License Agreement dated August 13, 2020 between the Company and the Regents of the University of California	S-1/A	333-257484	10.40	October 7, 2021
10.14	Third Amendment to the Amended License Agreement dated June 8, 2022 between the Company and the Regents of the University of California	8-K	001-40899	10.1	June 9, 2022
10.15	Supply and Development Support Agreement dated March 3, 2022 between the Company and Musculoskeletal Transplant Foundation, Inc.	10-K	001-40899	10.30	March 15, 2022
10.16	Securities Purchase Agreement (November 2023)	S-3	333-276412	99.1	January 17, 2024
10.17**	Form of Securities Purchase Agreement	—	—	—	—
21.1	List of Subsidiaries	8-K	000-53078	21.1	September 25, 2014
23.1*	Consent of Independent Registered Public Accounting Firm, Weinberg & Company, P.A.	—	—	—	—
23.2**	Consent of Harter Secrest & Emery LLP (included in Exhibit 5.1)	—	—	—	—
24.1*	Power of Attorney (included in signature page hereto)	—	—	—	—
101.INS**	Inline XBRL Instance Document	—	—	—	—
101.SCH**	Inline XBRL Taxonomy Extension Schema Document	—	—	—	—
101.CAL**	Inline XBRL Taxonomy Extension Calculation Linkbase Document	—	—	—	—
101.DEF**	Inline XBRL Taxonomy Extension Definition Linkbase Document	—	—	—	—
101.LAB**	Inline XBRL Taxonomy Extension Label Linkbase Document	—	—	—	—
101.PRE**	Inline XBRL Taxonomy Extension Presentation Linkbase Document	—	—	—	—
104	Cover Page formatted in Inline XBRL and contained in Exhibit 101				
107*	Filing Fee Table	—	—	—	—

* Filed herewith.
 ** To be filed by amendment.
 + Management contract or compensatory arrangement.

Item 17. Undertakings

The undersigned registrant hereby undertakes:

- (a)(1) To file, during any period in which offers or sales are being made, a post-effective amendment to this registration statement:
 - (i) To include any prospectus required by Section 10(a)(3) of the Securities Act;
 - (ii) To reflect in the prospectus any facts or events arising after the effective date of the registration statement (or the most recent post-effective amendment thereof) which, individually or in the aggregate, represent a fundamental change in the information set forth in the registration statement. Notwithstanding the foregoing, any increase or decrease in volume of securities offered (if the total dollar value of securities offered would not exceed that which was registered) and any deviation from the low or high end of the estimated maximum offering range may be reflected in the form of prospectus filed with the SEC pursuant to Rule 424(b) if, in the aggregate, the changes in volume and price represent no more than 20% change in the maximum aggregate offering price set forth in the "Calculation of Filing Fee Tables" or "Calculation of Registration Fee" table, as applicable, in the effective registration statement; and
 - (iii) To include any material information with respect to the plan of distribution not previously disclosed in the registration statement or any material change to such information in the registration statement;
- (2) That, for the purpose of determining any liability under the Securities Act, each such post-effective amendment shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial *bona fide* offering thereof.
- (3) To remove from registration by means of a post-effective amendment any of the securities being registered which remain unsold at the termination of the offering.
- (4) That, for the purpose of determining liability of the registrant under the Securities Act to any purchaser, each prospectus filed pursuant to Rule 424(b) as part of a registration statement relating to an offering, other than registration statements relying on Rule 430B or other than prospectuses filed in reliance on Rule 430A, shall be deemed to be part of and included in the registration statement as of the date it is first used after effectiveness. Provided, however, that no statement made in a registration statement or prospectus that is part of the registration statement or made in a document incorporated or deemed incorporated by reference into the registration statement or prospectus that is part of the registration statement will, as to a purchaser with a time of contract of sale prior to such first use, supersede or modify any statement that was made in the registration statement or prospectus that was part of the registration statement or made in any such document immediately prior to such date of first use.
- (5) For the purpose of determining liability of the registrant under the Securities Act to any purchaser in the initial distribution of the securities, that in a primary offering of securities of the undersigned registrant pursuant to this registration statement, regardless of the underwriting method used to sell the securities to the purchaser, if the securities are offered or sold to such purchaser by means of any of the following communications, the undersigned registrant will be a seller to the purchaser and will be considered to offer or sell such securities to such purchaser:
 - (i) Any preliminary prospectus or prospectus of the undersigned registrant relating to the offering required to be filed pursuant to Rule 424;
 - (ii) Any free writing prospectus relating to the offering prepared by or on behalf of the undersigned registrant or used or referred to by the undersigned registrant;
 - (iii) The portion of any other free writing prospectus relating to the offering containing material information about the undersigned registrant or its securities provided by or on behalf of the undersigned registrant; and
 - (iv) Any other communication that is an offer in the offering made by the undersigned registrant to the purchaser.
- (6) That,
 - (i) For purposes of determining any liability under the Securities Act, the information omitted from the form of prospectus filed as part of this registration statement in reliance on Rule 430A and contained in a form of prospectus filed by the undersigned registrant pursuant to Rule 424(b)(1) or (4) or 497(h) under the Securities Act shall be deemed to be part of this registration statement as of the time it was declared effective; and
 - (ii) For the purpose of determining any liability under the Securities Act, each post-effective amendment that contains a form of prospectus shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial *bona fide* offering thereof.

Insofar as indemnification for liabilities arising under the Securities Act of 1933 may be permitted to directors, officers and controlling persons of the registrant pursuant to the foregoing provisions, or otherwise, the registrant has been advised that in the opinion of the Securities Exchange Commission such indemnification is against public policy as expressed in the Act and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by the registrant of expenses incurred or paid by a director, officer or controlling person of the registrant in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, the registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the Act and will be governed by the final adjudication of such issue.

SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, the registrant has duly caused this registration statement to be signed on its behalf by the undersigned, thereunto duly authorized in the Town of Burlington, Commonwealth of Massachusetts, on January 30, 2024.

BONE BIOLOGICS CORPORATION

By: /s/ Jeffrey Frelick
Name: Jeffrey Frelick
Title: Chief Executive Officer
 (Principal Executive Officer)

POWER OF ATTORNEY

Each person whose signature appears below appoints Jeffrey Frelick and Deina H. Walsh, and each of them, each of whom may act without the joinder of the other, as his or her true and lawful attorney-in-fact and agent, with full power of substitution and resubstitution for him and her and in his or her name, place and stead, in any and all capacities to sign any and all amendments (including post-effective amendments) to this registration statement (and to any registration statement filed pursuant to Rule 462 under the Securities Act of 1933, as amended), and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents full power and authority to do and perform each and every act and thing requisite and necessary to be done, as fully to all intents and purposes as he might or would do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents or any of them or their or his or her substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Act of 1933, this registration statement has been signed by the following persons in the capacities and on the dates indicated.

<u>Signature</u>	<u>Title</u>	<u>Date</u>
<u>/s/ Jeffrey Frelick</u> Jeffrey Frelick	Chief Executive Officer (Principal Executive Officer)	January 30, 2024
<u>/s/ Deina H. Walsh</u> Deina H. Walsh	Chief Financial Officer (Principal Financial Officer and Principal Accounting Officer)	January 30, 2024
<u>/s/ Don R. Hankey</u> Don R. Hankey	Director	January 30, 2024
<u>/s/ Siddhesh Angle</u> Siddhesh Angle	Director	January 30, 2024
<u>/s/ Robert Gagnon</u> Robert Gagnon	Director	January 30, 2024
<u>/s/ Bruce Stroever</u> Bruce Stroever	Director	January 30, 2024

[FORM OF GLOBAL CERTIFICATE]

UNLESS THIS CERTIFICATE IS PRESENTED BY AN AUTHORIZED REPRESENTATIVE OF THE DEPOSITORY TRUST COMPANY, A NEW YORK CORPORATION (“DTC”), TO ISSUER OR ITS AGENT FOR REGISTRATION OF TRANSFER, EXCHANGE, OR PAYMENT, AND ANY CERTIFICATE ISSUED IS REGISTERED IN THE NAME OF CEDE & CO. OR IN SUCH OTHER NAME AS IS REQUESTED BY AN AUTHORIZED REPRESENTATIVE OF DTC (AND ANY PAYMENT IS MADE TO CEDE & CO. OR TO SUCH OTHER ENTITY AS IS REQUESTED BY AN AUTHORIZED REPRESENTATIVE OF DTC), ANY TRANSFER, PLEDGE, OR OTHER USE HEREOF FOR VALUE OR OTHERWISE BY OR TO ANY PERSON IS WRONGFUL INASMUCH AS THE REGISTERED OWNER HEREOF, CEDE & CO., HAS AN INTEREST HEREIN.

BONE BIOLOGICS CORPORATION
WARRANT CERTIFICATE
NOT EXERCISABLE AFTER October 13, 2026

This certifies that the person whose name and address appears below, or registered assigns, is the registered owner of the number of Warrants set forth below. Each Warrant entitles its registered holder to purchase from Bone Biologics Corporation, a company incorporated under the laws of the State of Delaware (the “**Company**”), at any time prior to 5:00 P.M. (New York City time) on October 13, 2026, one share of common stock, par value \$0.0001 per share, of the Company (each, a “**Warrant Share**” and collectively, the “**Warrant Shares**”), at an exercise price of \$6.30 per share, subject to possible adjustments as provided in the Warrant Agreement (as defined below).

This Warrant Certificate, with or without other Warrant Certificates, upon surrender at the designated office of the Warrant Agent, may be exchanged for another Warrant Certificate or Warrant Certificates evidencing the same number of Warrants as the Warrant Certificate or Warrant Certificates surrendered. A transfer of the Warrants evidenced hereby may be registered upon surrender of this Warrant Certificate at the designated office of the Warrant Agent by the registered holder in person or by a duly authorized attorney, properly endorsed or accompanied by proper instruments of transfer, a signature guarantee, and such other and further documentation as the Warrant Agent may reasonably request and duly stamped as may be required by the laws of the State of New York and of the United States of America.

The terms and conditions of the Warrants and the rights and obligations of the holder of this Warrant Certificate are set forth in the Warrant Agency Agreement dated as of October 13, 2021 (the “**Warrant Agreement**”) between the Company and Equiniti Shareholder Services, as Warrant Agent (the “**Warrant Agent**”). A copy of the Warrant Agreement is available for inspection during business hours at the office of the Warrant Agent.

This Warrant Certificate shall not be valid or obligatory for any purpose until it shall have been countersigned by an authorized signatory of the Warrant Agent.

WITNESS the facsimile signature of a proper officer of the Company.

BONE BIOLOGICS CORPORATION

By: _____
Name: Jeffrey Frelick
Title: Chief Executive Officer

Dated: October 13, 2021
Countersigned:
EQUINITI SHAREHOLDER SERVICES,
as Warrant Agent

By: _____
Name: Andrea Severson
Title: Relationship Director, Microcap

PLEASE DETACH HERE

Certificate No.: 1 Number of Warrants: []

WARRANT CUSIP NO.:

[Name & Address of Holder]

BONE BIOLOGICS CORPORATION
EQUINITI SHAREHOLDER SERVICES, Warrant Agent
By Mail: 1110 Centre Pointe Curve, Suite 101,
Mendota Heights, MN 55120
By hand or overnight courier:

[FORM OF CERTIFICATED WARRANT]

THE NUMBER OF COMMON SHARES ISSUABLE UPON EXERCISE OF THIS WARRANT MAY BE LESS THAN THE AMOUNTS SET FORTH ON THE FACE HEREOF PURSUANT TO SECTION 1(d) OF THIS WARRANT.

BONE BIOLOGICS CORPORATION

WARRANT TO PURCHASE COMMON SHARES

Warrant No.:
Date of Issuance: October 13, 2021 (“**Issuance Date**”)

Bone Biologics Corporation, a Delaware corporation (the “**Company**”), hereby certifies that, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, [BUYER], the registered holder hereof or its permitted assigns (the “**Holder**”), is entitled, subject to the terms set forth below, to purchase from the Company, at the Exercise Price (as defined below) then in effect, upon exercise of this Warrant to Purchase Common Shares (including any Warrants to Purchase Common Shares issued in exchange, transfer or replacement hereof, the “**Warrant**”), at any time or times on or after the Issuance Date, but not after 11:59 p.m., New York time, on the Expiration Date (as defined below), [] (subject to adjustment as provided herein) fully paid and non-assessable shares of Common Stock (as defined below) (the “**Warrant Shares**”, and such number of Warrant Shares, the “**Warrant Number**”). Except as otherwise defined herein, capitalized terms in this Warrant shall have the meanings set forth in Section 17. This Warrant is one of the Warrants to Purchase Common Shares (the “**Registered Warrants**”) issued pursuant to (i) Section 1 of that certain Underwriting Agreement, dated as of October 13, 2021 (the “**Subscription Date**”), by and among the Company and the underwriter(s) referred to therein, as amended from time to time (the “**Underwriting Agreement**”) and (ii) the Company’s Registration Statement on Form S-1 (File number 333-257484) (the “**Registration Statement**”).

1. EXERCISE OF WARRANT.

(a) Mechanics of Exercise. Subject to the terms and conditions hereof (including, without limitation, the limitations set forth in Section 1(f)), this Warrant may be exercised by the Holder on any day on or after the Issuance Date (an “**Exercise Date**”), in whole or in part, by delivery (whether via facsimile, electronic mail or otherwise) of a written notice, in the form attached hereto as **Exhibit A** (the “**Exercise Notice**”), of the Holder’s election to exercise this Warrant. Within one (1) Trading Day following an exercise of this Warrant as aforesaid, the Holder shall deliver payment to the Company of an amount equal to the Exercise Price in effect on the date of such exercise multiplied by the number of Warrant Shares as to which this Warrant was so exercised (the “**Aggregate Exercise Price**”) in cash or via wire transfer of immediately available funds if the Holder did not notify the Company in such Exercise Notice that such exercise was made pursuant to a Cashless Exercise (as defined in Section 1(d)). The Holder shall not be required to deliver the original of this Warrant in order to effect an exercise hereunder. Execution and delivery of an Exercise Notice with respect to less than all of the Warrant Shares shall have the same effect as cancellation of the original of this Warrant and issuance of a new Warrant evidencing the right to purchase the remaining number of Warrant Shares. Execution and delivery of an Exercise Notice for all of the then-remaining Warrant Shares shall have the same effect as cancellation of the original of this Warrant after delivery of the Warrant Shares in accordance with the terms hereof. On or before the first (1st) Trading Day following the date on which the Company has received an Exercise Notice, the Company shall transmit by facsimile or electronic mail an acknowledgment of confirmation of receipt of such Exercise Notice, in the form attached hereto as **Exhibit C**, to the Holder and the Company’s transfer agent (the “**Transfer Agent**”), which confirmation shall constitute an instruction to the Transfer Agent to process such Exercise Notice in accordance with the terms herein. On or before the second (2nd) Trading Day following the date on which the Company has received such Exercise Notice (or such earlier date as required pursuant to the 1934 Act or other applicable law, rule or regulation for the settlement of a trade of such Warrant Shares initiated on the applicable Exercise Date), the Company shall (i) provided that the Transfer Agent is participating in The Depository Trust Company (“**DTC**”) Fast Automated Securities Transfer Program (“**FAST Program**”), upon the request of the Holder, credit such aggregate number of Common Shares to which the Holder is entitled pursuant to such exercise to the Holder’s or its designee’s balance account with DTC through its Deposit/Withdrawal at Custodian system, or (ii) if the Transfer Agent is not participating in the DTC FAST Program, upon the request of the Holder, issue and deliver (via reputable overnight courier) to the address as specified in the Exercise Notice, a certificate, registered in the name of the Holder or its designee, for the number of Common Shares to which the Holder shall be entitled pursuant to such exercise, which Common Shares shall be freely tradeable pursuant to all applicable securities laws. Upon delivery of an Exercise Notice, the Holder shall be deemed for all corporate purposes to have become the holder of record of the Warrant Shares with respect to which this Warrant has been exercised, irrespective of the date such Warrant Shares are credited to the Holder’s DTC account or the date of delivery of the certificates evidencing such Warrant Shares (as the case may be). If this Warrant is submitted in connection with any exercise pursuant to this Section 1(a) and the number of Warrant Shares represented by this Warrant submitted for exercise is greater than the number of Warrant Shares being acquired upon an exercise and upon surrender of this Warrant to the Company by the Holder, then, at the request of the Holder, the Company shall as soon as practicable and in no event later than two (2) Business Days after any exercise and at its own expense, issue and deliver to the Holder (or its designee) a new Warrant (in accordance with Section 7(d)) representing the right to purchase the number of Warrant Shares purchasable immediately prior to such exercise under this Warrant, less the number of Warrant Shares with respect to which this Warrant is exercised. No fractional Common Shares are to be issued upon the exercise of this Warrant, but rather the number of Common Shares to be issued shall be rounded up to the nearest whole number. The Company shall pay any and all transfer, stamp, issuance and similar taxes, costs and expenses (including, without limitation, fees and expenses of the Transfer Agent) that may be payable with respect to the issuance and delivery of Warrant Shares upon exercise of this Warrant. Notwithstanding the foregoing, except in the case where an exercise of this Warrant is validly made pursuant to a Cashless Exercise, the Company’s failure to deliver Warrant Shares to the Holder on or prior to the later of (A) two (2) Trading Days after receipt of the applicable Exercise Notice (or such earlier date as required pursuant to the 1934 Act or other applicable law, rule or regulation for the settlement of a trade of such Warrant Shares initiated on the applicable Exercise Date) and (B) one (1) Trading Day after the Company’s receipt of the Aggregate Exercise Price (or valid notice of a Cashless Exercise) (such later date, the “**Share Delivery Date**”) shall not be deemed to be a breach of this Warrant. From the Issuance Date through and including the Expiration Date, the Company shall maintain a transfer agent that participates in the DTC FAST Program. Notwithstanding any other provision in this Agreement, the Holder may elect, at its sole discretion, to receive unregistered Warrant Shares issued in response to an Exercise Notice instead of Warrant Shares (i) registered pursuant to the Registration Statement or any other registration statement or (ii) issued pursuant to Section 1(c).

(b) Exercise Price. For purposes of this Warrant, “**Exercise Price**” means \$6.30 subject to adjustment as provided herein.

(c) Company’s Failure to Timely Deliver Securities. If the Company shall fail, for any reason or for no reason, on or prior to the Share Delivery Date, either (I) if the Transfer Agent is not participating in the DTC FAST Program, to issue and deliver to the Holder (or its designee) a certificate for the number of Warrant Shares to which the Holder is entitled and register such Warrant Shares on the Company’s share register or, if the Transfer Agent is participating in the DTC FAST Program, to credit the balance account of the Holder or the Holder’s designee with DTC for such number of Warrant Shares to which the Holder is entitled upon the Holder’s exercise of this Warrant (as the case may be) or (II) if the Registration Statement (or prospectus contained therein) covering the issuance of the Warrant Shares that are the subject of the Exercise Notice (the “**Unavailable Warrant Shares**”) is not available for the issuance of such Unavailable Warrant Shares and the Company fails to promptly (x) so notify the Holder and (y) deliver the Warrant Shares electronically without any restrictive legend by crediting such aggregate number of Warrant Shares to which the Holder is entitled pursuant to such exercise to the Holder’s or its designee’s balance account with DTC through its Deposit/Withdrawal At Custodian system (the event described in the immediately foregoing clause (II) is hereinafter referred as a “**Notice Failure**” and together with the event described in clause (I) above, a “**Delivery Failure**”), and if on or after such Share Delivery Date the Holder purchases (in an open market transaction or otherwise) Common Shares to deliver in satisfaction of a sale by the Holder of all or any portion of the number of Common Shares issuable upon such exercise that the Holder is entitled to receive from the Company (a “**Buy-In**”), then, in addition to all other remedies available to the Holder, the Company shall, within two (2) Business Days after the Holder’s request and in the Holder’s discretion, either (i) as an indemnity for loss hereunder, pay cash to the Holder in an amount equal to the Holder’s total purchase price (including brokerage commissions and other out-of-pocket expenses, if any) for the Common Shares so purchased (including, without limitation, by any other Person in respect, or on behalf, of the Holder) (the “**Buy-In Price**”), at which point the Company’s obligation to so issue and deliver such certificate (and to issue such Common Shares) or credit the balance account of such Holder or such Holder’s designee, as applicable, with DTC for the number of Warrant Shares to which the Holder is entitled upon the Holder’s exercise hereunder (as the case may be) (and to issue such Warrant Shares) shall terminate, or (ii) promptly honor its obligation to so issue and deliver to the Holder a certificate or certificates representing such Warrant Shares or credit the balance account of such Holder or such Holder’s designee, as applicable, with DTC for the number of Warrant Shares to which the Holder is entitled upon the Holder’s exercise hereunder (as the case may be) and, as an indemnity for loss hereunder, pay cash to the Holder in an amount equal to the excess (if any) of the Holder’s total purchase price (including brokerage commissions and other out-of-pocket expenses, if any) for the Common Shares so purchased (including, without limitation, by any other Person in respect, or on behalf, of the Holder) (the “**Buy-In Price**”) over the product of (A) such number of Warrant Shares multiplied by (B) the lowest Closing Sale Price of the Common Shares on any Trading Day during the period commencing on the date of the applicable Exercise Notice and ending on the date of such issuance and payment under this clause (ii) (the “**Buy-In Payment Amount**”). Nothing shall limit the Holder’s right to pursue any other remedies available to it hereunder, at law or in equity, including, without limitation, a decree of specific performance and/or injunctive relief with respect to the Company’s failure to timely deliver certificates representing Common Shares (or to electronically deliver such Common Shares) upon the exercise of this Warrant as required pursuant to the terms hereof. While this Warrant is outstanding, the Company shall cause its transfer agent to participate in the DTC FAST Program. In addition to the foregoing rights, (i) if the Company fails to deliver the applicable number of Warrant Shares upon an exercise pursuant to Section 1 by the applicable Share Delivery Date, then the Holder shall have the right to rescind such exercise in whole or in part and retain and/or have the Company return, as the case may be, any portion of this Warrant that has not been exercised pursuant to such Exercise Notice; provided that the rescission of an exercise shall not affect the Company’s obligation to make any payments that have accrued prior to the date of such notice pursuant to this Section 1(c) or otherwise except with respect to any returned portion of an exercise under this subclause (i), and (ii) if a registration statement (which may be the Registration Statement) covering the issuance or resale of the Warrant Shares that are subject to an Exercise Notice is not available for the issuance or resale, as applicable, of such Exercise Notice Warrant Shares and the Holder has submitted an Exercise Notice prior to receiving notice of the non-availability of such registration statement and the Company has not already delivered the Warrant Shares underlying such Exercise Notice electronically without any restrictive legend by crediting such aggregate number of Warrant Shares to which the Holder is entitled pursuant to such exercise to the Holder’s or its designee’s balance account with DTC through its Deposit / Withdrawal At Custodian system, the Holder shall have the option, by delivery of notice to the Company, to (x) rescind such Exercise Notice in whole or in part and retain or have returned, as the case may be, any portion of this Warrant that has not been exercised pursuant to such Exercise Notice; provided that the rescission of an Exercise Notice shall not affect the Company’s obligation to make any payments that have accrued prior to the date of such notice pursuant to this Section 1(c) or otherwise, and/or (y) switch some or all of such Exercise Notice from a cash exercise to a Cashless Exercise.

(d) Cashless Exercise. Notwithstanding anything contained herein to the contrary (other than Section 1(f) below), if at the time of exercise hereof the Registration Statement is not effective (or the prospectus contained therein is not available for use) for the issuance of all of the Warrant Shares, then the Holder may, in its sole discretion, exercise this Warrant in whole or in part and, in lieu of making the cash payment otherwise contemplated to be made to the Company upon such exercise in payment of the Aggregate Exercise Price, elect instead to receive upon such exercise the “Net Number” of Warrant Shares determined according to the following formula (a “**Cashless Exercise**”):

Net Number =
$$\frac{[(A-B) \times (X)]}{A}$$

For purposes of the foregoing formula:

A= As applicable: (i) the VWAP on the Trading Day immediately preceding the date of the applicable Notice of Exercise if such Notice of Exercise is (1) both executed and delivered pursuant to Section 1 hereof on a day that is not a Trading Day or (2) both executed and delivered pursuant to Section 1 hereof on a Trading Day prior to the opening of “regular trading hours” (as defined in Rule 600(b)(68) of Regulation NMS promulgated under the federal securities laws) on such Trading Day, (ii) at the option of the Holder, either (y) the VWAP on the Trading Day immediately preceding the date of the applicable Notice of Exercise or (z) the Bid Price of the Common Shares on the principal Trading Market as reported by Bloomberg L.P. as of the time of the Holder’s execution of the applicable Notice of Exercise if such Notice of Exercise is executed during “regular trading hours” on a Trading Day and is delivered within two (2) hours thereafter (including until two (2) hours after the close of “regular trading hours” on a Trading Day) pursuant to Section 1 hereof, or (iii) the VWAP on the date of the applicable Notice of Exercise if the date of such Notice of Exercise is a Trading Day and such Notice of Exercise is both executed and delivered pursuant to Section 1 hereof after the close of “regular trading hours” on such Trading Day.

B= The Exercise Price then in effect for the applicable Warrant Shares at the time of such exercise.

X= The number of Warrant Shares that would be issuable upon exercise of this Warrant in accordance with the terms of this Warrant if such exercise were by means of a cash exercise rather than a cashless exercise.

If the Warrant Shares are issued in a Cashless Exercise, the parties acknowledge and agree that in accordance with Section 3(a)(9) of the 1933 Act, the Warrant Shares take on the registered characteristics of the Warrants being exercised. For purposes of Rule 144(d) promulgated under the 1933 Act, as in effect on the Initial Exercise Date, it is intended that the Warrant Shares issued in a Cashless Exercise shall be deemed to have been acquired by the Holder, and the holding period for the Warrant Shares shall be deemed to have commenced, on the date this Warrant was originally issued pursuant to the Underwriting Agreement. Notwithstanding anything herein to the contrary, on the Expiration Date, this Warrant shall be automatically exercised via cashless exercise pursuant to this Section 1(d).

(e) Disputes. In the case of a dispute as to the determination of the Exercise Price or the arithmetic calculation of the number of Warrant Shares to be issued pursuant to the terms hereof, the Company shall promptly issue to the Holder the number of Warrant Shares that are not disputed and resolve such dispute in accordance with Section 13.

(f) Limitations on Exercises. The Company shall not effect the exercise of any portion of this Warrant, and the Holder shall not have the right to exercise any portion of this Warrant, pursuant to the terms and conditions of this Warrant and any such exercise shall be null and void and treated as if never made, to the extent that after giving effect to such exercise, the Holder together with the other Attribution Parties collectively would beneficially own in excess of 4.99% (the “**Maximum Percentage**”) of the Common Shares outstanding immediately after giving effect to such exercise. For purposes of the foregoing sentence, the aggregate number of Common Shares beneficially owned by the Holder and the other Attribution Parties shall include the number of Common Shares held by the Holder and all other Attribution Parties plus the number of Common Shares issuable upon exercise of this Warrant with respect to which the determination of such sentence is being made, but shall exclude Common Shares which would be issuable upon (A) exercise of the remaining, unexercised portion of this Warrant beneficially owned by the Holder or any of the other Attribution Parties and (B) exercise or conversion of the unexercised or unconverted portion of any other securities of the Company (including, without limitation, any convertible notes or convertible preferred shares or warrants, including other Registered Warrants) beneficially owned by the Holder or any other Attribution Party subject to a limitation on conversion or exercise analogous to the limitation contained in this Section 1(f). For purposes of this Section 1(f), beneficial ownership shall be calculated in accordance with Section 13(d) of the 1934 Act. For purposes of determining the number of outstanding Common Shares the Holder may acquire upon the exercise of this Warrant without exceeding the Maximum Percentage, the Holder may rely on the number of outstanding Common Shares as reflected in (x) the Company’s most recent Annual Report on Form 10-K, Quarterly Report on Form 10-Q, Current Report on Form 8-K or other public filing with the SEC, as the case may be, (y) a more recent public announcement by the Company or (z) any other written notice by the Company or the Transfer Agent, if any, setting forth the number of Common Shares outstanding (the “**Reported Outstanding Share Number**”). If the Company receives an Exercise Notice from the Holder at a time when the actual number of outstanding Common Shares is less than the Reported Outstanding Share Number, the Company shall (i) notify the Holder in writing of the number of Common Shares then outstanding and, to the extent that such Exercise Notice would otherwise cause the Holder’s beneficial ownership, as determined pursuant to this Section 1(f), to exceed the Maximum Percentage, the Holder must notify the Company of a reduced number of Warrant Shares to be acquired pursuant to such Exercise Notice (the number of shares by which such purchase is reduced, the “**Reduction Shares**”) and (ii) as soon as reasonably practicable, the Company shall return to the Holder any exercise price paid by the Holder for the Reduction Shares. For any reason at any time, upon the written or oral request of the Holder, the Company shall within one (1) Business Day confirm orally and in writing or by electronic mail to the Holder the number of Common Shares then outstanding. In any case, the number of outstanding Common Shares shall be determined after giving effect to the conversion or exercise of securities of the Company, including this Warrant, by the Holder and any other Attribution Party since the date as of which the Reported Outstanding Share Number was reported. In the event that the issuance of Common Shares to the Holder upon exercise of this Warrant results in the Holder and the other Attribution Parties being deemed to beneficially own, in the aggregate, more than the Maximum Percentage of the number of outstanding Common Shares (as determined under Section 13(d) of the 1934 Act), the number of shares so issued by which the Holder’s and the other Attribution Parties’ aggregate beneficial ownership exceeds the Maximum Percentage (the “**Excess Shares**”) shall be deemed null and void and shall be cancelled ab initio, and the Holder shall not have the power to vote or to transfer the Excess Shares. As soon as reasonably practicable after the issuance of the Excess Shares has been deemed null and void, the Company shall return to the Holder the exercise price paid by the Holder for the Excess Shares. Upon delivery of a written notice to the Company, the Holder may from time to time increase (with such increase not effective until the sixty-first (61st) day after delivery of such notice) or decrease the Maximum Percentage to any other percentage not in excess of 9.99% as specified in such notice; provided that (i) any such increase in the Maximum Percentage will not be effective until the sixty-first (61st) day after such notice is delivered to the Company and (ii) any such increase or decrease will apply only to the Holder and the other Attribution Parties and not to any other holder of Registered Warrants that is not an Attribution Party of the Holder. For purposes of clarity, the Common Shares issuable pursuant to the terms of this Warrant in excess of the Maximum Percentage shall not be deemed to be beneficially owned by the Holder for any purpose including for purposes of Section 13(d) or Rule 16a-1(a)(1) of the 1934 Act. No prior inability to exercise this Warrant pursuant to this paragraph shall have any effect on the applicability of the provisions of this paragraph with respect to any subsequent determination of exercisability. The provisions of this paragraph shall be construed and implemented in a manner otherwise than in strict conformity with the terms of this Section 1(f) to the extent necessary to correct this paragraph or any portion of this paragraph which may be defective or inconsistent with the intended beneficial ownership limitation contained in this Section 1(f) or to make changes or supplements necessary or desirable to properly give effect to such limitation. The limitation contained in this paragraph may not be waived and shall apply to a successor holder of this Warrant.

(g) Reservation of Shares.

(i) Required Reserve Amount. So long as this Warrant remains outstanding, the Company shall at all times keep reserved for issuance under this Warrant a number of Common Shares at least equal to 100% of the maximum number of Common Shares as shall be necessary to satisfy the Company's obligation to issue Common Shares under the Registered Warrants then outstanding (without regard to any limitations on exercise) (the "**Required Reserve Amount**"); provided that at no time shall the number of Common Shares reserved pursuant to this Section 1(g)(i) be reduced other than proportionally in connection with any exercise of Registered Warrants or such other event covered by Section 2(a) below. The Required Reserve Amount (including, without limitation, each increase in the number of shares so reserved) shall be allocated pro rata among the holders of the Registered Warrants based on number of Common Shares issuable upon exercise of Registered Warrants held by each holder on the Issuance Date (without regard to any limitations on exercise) or increase in the number of reserved shares, as the case may be (the "**Authorized Share Allocation**"). In the event that a holder shall sell or otherwise transfer any of such holder's Registered Warrants, each transferee shall be allocated a pro rata portion of such holder's Authorized Share Allocation. Any Common Shares reserved and allocated to any Person which ceases to hold any Registered Warrants shall be allocated to the remaining holders of Registered Warrants, pro rata based on the number of Common Shares issuable upon exercise of the Registered Warrants then held by such holders (without regard to any limitations on exercise).

(ii) Insufficient Authorized Shares. If, notwithstanding Section 1(g)(i) above, and not in limitation thereof, at any time while any of the Registered Warrants remain outstanding, the Company does not have a sufficient number of authorized and unreserved Common Shares to satisfy its obligation to reserve the Required Reserve Amount (an "**Authorized Share Failure**"), then the Company shall immediately take all action necessary to increase the Company's authorized Common Shares to an amount sufficient to allow the Company to reserve the Required Reserve Amount for all the Registered Warrants then outstanding. Without limiting the generality of the foregoing sentence, as soon as practicable after the date of the occurrence of an Authorized Share Failure, but in no event later than sixty (60) days after the occurrence of such Authorized Share Failure, the Company shall hold a meeting of its shareholders for the approval of an increase in the number of authorized Common Shares. In connection with such meeting, the Company shall provide each shareholder with a proxy statement and shall use its best efforts to solicit its shareholders' approval of such increase in authorized Common Shares and to cause its board of directors to recommend to the shareholders that they approve such proposal. In the event that the Company is prohibited from issuing Common Shares upon an exercise of this Warrant due to the failure by the Company to have sufficient Common Shares available out of the authorized but unissued Common Shares (such unavailable number of Common Shares, the "**Authorization Failure Shares**"), in lieu of delivering such Authorization Failure Shares to the Holder, the Company shall pay cash in exchange for the cancellation of such portion of this Warrant exercisable into such Authorization Failure Shares at a price equal to the sum of (i) the product of (x) such number of Authorization Failure Shares and (y) the greatest Closing Sale Price of the Common Shares on any Trading Day during the period commencing on the date the Holder delivers the applicable Exercise Notice with respect to such Authorization Failure Shares to the Company and ending on the date of such issuance and payment under this Section 1(f); and (ii) to the extent the Holder purchases (in an open market transaction or otherwise) Common Shares to deliver in satisfaction of a sale by the Holder of Authorization Failure Shares, any Buy-In Payment Amount, brokerage commissions and other out-of-pocket expenses, if any, of the Holder incurred in connection therewith.

(h) Warrant Agency Agreement. If this Warrant is held in global form through DTC (or any successor depository), this Warrant is issued subject to the Warrant Agency Agreement, dated October 13, 2021 by and between the Company and Equiniti Shareholder Services (the “**Warrant Agency Agreement**”). To the extent any provision of this Warrant conflicts with the express provisions of the Warrant Agency Agreement, the provisions of this Warrant shall govern and be controlling.

2. ADJUSTMENT OF EXERCISE PRICE AND NUMBER OF WARRANT SHARES. The Exercise Price and number of Warrant Shares issuable upon exercise of this Warrant are subject to adjustment from time to time as set forth in this Section 2.

(a) Share Dividends and Splits. Without limiting any provision of Section 4, if the Company, at any time on or after the Subscription Date, (i) pays a share dividend on one or more classes of its then outstanding Common Shares or otherwise makes a distribution on any class of capital shares that is payable in Common Shares, (ii) subdivides (by any share split, share dividend, recapitalization or otherwise) one or more classes of its then outstanding Common Shares into a larger number of shares or (iii) combines (by combination, reverse share split or otherwise) one or more classes of its then outstanding Common Shares into a smaller number of shares, then in each such case the Exercise Price shall be multiplied by a fraction of which the numerator shall be the number of Common Shares outstanding immediately before such event and of which the denominator shall be the number of Common Shares outstanding immediately after such event. Any adjustment made pursuant to clause (i) of this paragraph shall become effective immediately after the record date for the determination of shareholders entitled to receive such dividend or distribution, and any adjustment pursuant to clause (ii) or (iii) of this paragraph shall become effective immediately after the effective date of such subdivision or combination.

(b) Number of Warrant Shares. Simultaneously with any adjustment to the Exercise Price pursuant to this Section 2, the number of Warrant Shares that may be purchased upon exercise of this Warrant shall be increased or decreased proportionately, so that after such adjustment the aggregate Exercise Price payable hereunder for the adjusted number of Warrant Shares shall be the same as the aggregate Exercise Price in effect immediately prior to such adjustment (without regard to any limitations on exercise contained herein).

(c) Other Events. In the event that the Company (or any Subsidiary (as defined in the Underwriting Agreement)) shall take any action to which the provisions hereof are not strictly applicable, or, if applicable, would not operate to protect the Holder from dilution or if any event occurs of the type contemplated by the provisions of this Section 2 but not expressly provided for by such provisions (including, without limitation, the granting of share appreciation rights, phantom share rights or other rights with equity features), then the Company's board of directors shall in good faith determine and implement an appropriate adjustment in the Exercise Price and the number of Warrant Shares (if applicable) so as to protect the rights of the Holder, provided that no such adjustment pursuant to this Section 2(c) will increase the Exercise Price or decrease the number of Warrant Shares as otherwise determined pursuant to this Section 2, provided further that if the Holder does not accept such adjustments as appropriately protecting its interests hereunder against such dilution, then the Company's board of directors and the Holder shall agree, in good faith, upon an independent investment bank of nationally recognized standing to make such appropriate adjustments, whose determination shall be final and binding absent manifest error and whose fees and expenses shall be borne by the Company.

(d) Calculations. All calculations under this Section 2 shall be made by rounding to the nearest cent or the nearest 1/100th of a share, as applicable. The number of Common Shares outstanding at any given time shall not include shares owned or held by or for the account of the Company, and the disposition of any such shares shall be considered an issuance or sale of Common Shares.

3. RIGHTS UPON DISTRIBUTION OF ASSETS. In addition to any adjustments pursuant to Section 2 above, if the Company shall declare or make any dividend or other distribution of its assets (or rights to acquire its assets) to holders of Common Shares, by way of return of capital or otherwise (including, without limitation, any distribution of cash, shares or other securities, property, options, evidence of indebtedness or any other assets by way of a dividend, spin off, reclassification, corporate rearrangement, plan of arrangement or other similar transaction) (a "**Distribution**"), at any time after the issuance of this Warrant, then, in each such case, the Holder shall be entitled to participate in such Distribution to the same extent that the Holder would have participated therein if the Holder had held the number of Common Shares acquirable upon complete exercise of this Warrant (without regard to any limitations or restrictions on exercise of this Warrant, including without limitation, the Maximum Percentage) immediately before the date on which a record is taken for such Distribution, or, if no such record is taken, the date as of which the record holders of Common Shares are to be determined for the participation in such Distribution (provided, however, that to the extent that the Holder's right to participate in any such Distribution would result in the Holder and the other Attribution Parties exceeding the Maximum Percentage, then the Holder shall not be entitled to participate in such Distribution to the extent of the Maximum Percentage (and shall not be entitled to beneficial ownership of such Shares Common Shares as a result of such Distribution (and beneficial ownership) to the extent of any such excess) and the portion of such Distribution shall be held in abeyance for the benefit of the Holder until such time or times, if ever, as its right thereto would not result in the Holder and the other Attribution Parties exceeding the Maximum Percentage, at which time or times the Holder shall be granted such Distribution (and any Distributions declared or made on such initial Distribution or on any subsequent Distribution held similarly in abeyance) to the same extent as if there had been no such limitation).

4. PURCHASE RIGHTS; FUNDAMENTAL TRANSACTIONS.

(a) Purchase Rights. In addition to any adjustments pursuant to Section 2 above, if at any time the Company grants, issues or sells any Options, Convertible Securities or rights to purchase shares, warrants, securities or other property pro rata to the record holders of any class of Common Shares (the "**Purchase Rights**"), then the Holder will be entitled to acquire, upon the terms applicable to such Purchase Rights, the aggregate Purchase Rights which the Holder could have acquired if the Holder had held the number of Common Shares acquirable upon complete exercise of this Warrant (without regard to any limitations or restrictions on exercise of this Warrant, including without limitation, the Maximum Percentage) immediately before the date on which a record is taken for the grant, issuance or sale of such Purchase Rights, or, if no such record is taken, the date as of which the record holders of Common Shares are to be determined for the grant, issuance or sale of such Purchase Rights (provided, however, that to the extent that the Holder's right to participate in any such Purchase Right would result in the Holder and the other Attribution Parties exceeding the Maximum Percentage, then the Holder shall not be entitled to participate in such Purchase Right to the extent of the Maximum Percentage (and shall not be entitled to beneficial ownership of such Common Shares as a result of such Purchase Right (and beneficial ownership) to the extent of any such excess) and such Purchase Right to such extent shall be held in abeyance for the benefit of the Holder until such time or times, if ever, as its right thereto would not result in the Holder and the other Attribution Parties exceeding the Maximum Percentage, at which time or times the Holder shall be granted such right (and any Purchase Right granted, issued or sold on such initial Purchase Right or on any subsequent Purchase Right held similarly in abeyance) to the same extent as if there had been no such limitation).

(b) Fundamental Transactions. If, at any time while this Warrant is outstanding, (i) the Company, directly or indirectly, in one or more related transactions effects any merger or consolidation of the Company with or into another Person, (ii) the Company or any Subsidiary, directly or indirectly, effects any sale, lease, license, assignment, transfer, conveyance or other disposition of all or substantially all of its assets in one or a series of related transactions, (iii) any, direct or indirect, purchase offer, tender offer or exchange offer (whether by the Company or another Person) is completed pursuant to which holders of Common Shares are permitted to sell, tender or exchange their shares for other securities, cash or property and has been accepted by the holders of 50% or more of the outstanding Common Shares, (iv) the Company, directly or indirectly, in one or more related transactions effects any reclassification, reorganization or recapitalization of the Common Shares or any compulsory share exchange pursuant to which the Common Shares are effectively converted into or exchanged for other securities, cash or property, or (v) the Company, directly or indirectly, in one or more related transactions consummates a stock or share purchase agreement or other business combination (including, without limitation, a reorganization, recapitalization, spin-off, merger or scheme of arrangement) with another Person or group of Persons whereby such other Person or group acquires more than 50% of the outstanding Common Shares (not including any Common Shares held by the other Person or other Persons making or party to, or associated or affiliated with the other Persons making or party to, such stock or share purchase agreement or other business combination) (each a “**Fundamental Transaction**”), then, upon any subsequent exercise of this Warrant, the Holder shall have the right to receive, for each Warrant Share that would have been issuable upon such exercise immediately prior to the occurrence of such Fundamental Transaction, at the option of the Holder (without regard to any limitation in Section 1(f) on the exercise of this Warrant), the number of shares of common stock of the successor or acquiring corporation or of the Company, if it is the surviving corporation, and any additional consideration (the “**Alternate Consideration**”) receivable as a result of such Fundamental Transaction by a holder of the number of Common Shares for which this Warrant is exercisable immediately prior to such Fundamental Transaction (without regard to any limitation in Section 1(f) on the exercise of this Warrant). For purposes of any such exercise, the determination of the Exercise Price shall be appropriately adjusted to apply to such Alternate Consideration based on the amount of Alternate Consideration issuable in respect of one Common Share in such Fundamental Transaction, and the Company shall apportion the Exercise Price among the Alternate Consideration in a reasonable manner reflecting the relative value of any different components of the Alternate Consideration. If holders of Common Shares are given any 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 Alternate Consideration it receives upon any exercise of this Warrant following such Fundamental Transaction. Notwithstanding anything to the contrary, in the event of a Fundamental Transaction, the Company or any Successor Entity (as defined below) shall, at the Holder’s option, exercisable at any time concurrently with, or within thirty (30) days after, the consummation of the Fundamental Transaction (or, if later, the date of the public announcement of the applicable Fundamental Transaction), purchase this Warrant from the Holder by paying to the Holder an amount of cash equal to the Black Scholes Value (as defined below) of the remaining unexercised portion of this Warrant on the date of the consummation of such Fundamental Transaction; provided, however, that (i) if the Fundamental Transaction is not within the Company’s control, including not approved by the Company’s Board of Directors, Holder shall only be entitled to receive from the Company or any Successor Entity, as of the date of consummation of such Fundamental Transaction, the same type or form of consideration (and in the same proportion) for the purchase of this Warrant, at the value per share of common stock, par value \$0.0001 per share, (“**Common Stock**”) in the Fundamental Transaction for each Warrant Share underlying the unexercised portion of this Warrant, that is being offered and paid to the holders of Common Stock of the Company in connection with the Fundamental Transaction, whether that consideration be in the form of cash, stock or any combination thereof, or whether the holders of Common Stock are given the choice to receive from among alternative forms of consideration in connection with the Fundamental Transaction; and (ii) for purposes of clarification, Holder shall not be required to exercise the Warrant or pay the exercise price thereof in order to receive such consideration. “Black Scholes Value” means the value of this Warrant based on the Black Scholes Option Pricing Model obtained from the “OV” function on Bloomberg, L.P. (“Bloomberg”) determined as of the day of consummation of the applicable Fundamental Transaction for pricing purposes and reflecting (A) a risk-free interest rate corresponding to the U.S. Treasury rate for a period equal to the time between the date of the public announcement of the applicable Fundamental Transaction and the Expiration Date, (B) an expected volatility equal to the 100 day volatility obtained from the HVT function on Bloomberg (determined utilizing a 365 day annualization factor) as of the Trading Day immediately following the public announcement of the applicable Fundamental Transaction, (C) the underlying price per share used in such calculation shall be the greater of (i) the sum of the price per share being offered in cash, if any, plus the value of any non-cash consideration, if any, being offered in such Fundamental Transaction and (ii) the greater of (x) the last VWAP immediately prior to the public announcement of such Fundamental Transaction and (y) the last VWAP immediately prior to the consummation of such Fundamental Transaction, (D) a zero cost of borrow and (E) a remaining option time equal to the time between the date of the public announcement of the applicable Fundamental Transaction and the Expiration Date. The payment of the Black Scholes Value will be made by wire transfer of immediately available funds within five Business Days of the Holder’s election (or, if later, on the effective date of the Fundamental Transaction). The Company shall cause any successor entity in a Fundamental Transaction in which the Company is not the survivor (the “Successor Entity”) to assume in writing all of the obligations of the Company under this Warrant and the other transaction documents in accordance with the provisions of this Section 4(b) pursuant to written agreements in form and substance reasonably satisfactory to the Holder and approved by the Holder (without unreasonable delay) prior to such Fundamental Transaction and shall, at the option of the Holder, deliver to the Holder in exchange for this Warrant a security of the Successor Entity evidenced by a written instrument substantially similar in form and substance to this Warrant which is exercisable for a corresponding number of shares of capital stock of such Successor Entity (or its parent entity) equivalent to the Common Shares acquirable and receivable upon exercise of this Warrant (without regard to any limitations on the exercise of this Warrant) prior to such Fundamental Transaction, and with an exercise price which applies the exercise price hereunder to such shares of capital stock (but taking into account the relative value of the Common Shares pursuant to such Fundamental Transaction and the value of such shares of capital stock, such number of shares of capital stock and such exercise price being for the purpose of protecting the economic value of this Warrant immediately prior to the consummation of such Fundamental Transaction), and which is reasonably satisfactory in form and substance to the Holder. Upon the occurrence of any such Fundamental Transaction, the Successor Entity shall succeed to, and be substituted for (so that from and after the date of such Fundamental Transaction, the provisions of this Warrant and the other transaction documents referring to the “Company” shall refer instead to the Successor Entity), and may exercise every right and power of the Company and shall assume all of the obligations of the Company under this Warrant and the other transaction documents with the same effect as if such Successor Entity had been named as the Company herein.

(c) [RESERVED.]

(d) Application. The provisions of this Section 4 shall apply similarly and equally to successive Fundamental Transactions and Corporate Events and shall be applied as if this Warrant (and any such subsequent warrants) were fully exercisable and without regard to any limitations on the exercise of this Warrant (provided that the Holder shall continue to be entitled to the benefit of the Maximum Percentage, applied however with respect to capital shares registered under the 1934 Act and thereafter receivable upon exercise of this Warrant (or any such other warrant)).

5. NONCIRCUMVENTION. The Company hereby covenants and agrees that the Company will not, by amendment of its certificate of incorporation or other organizational documents or through any reorganization, transfer of assets, consolidation, merger, amalgamation, plan of arrangement, dissolution, issuance or sale of securities, or any other voluntary action, avoid or seek to avoid the observance or performance of any of the terms of this Warrant, and will at all times in good faith carry out all the provisions of this Warrant and take all action as may be required to protect the rights of the Holder. Without limiting the generality of the foregoing, the Company (a) shall not increase the par value of any Common Shares receivable upon the exercise of this Warrant above the Exercise Price then in effect, and (b) shall take all such actions as may be necessary or appropriate in order that the Company may validly and legally issue fully paid and non-assessable Common Shares upon the exercise of this Warrant, which Common Shares shall be freely tradeable pursuant to all applicable securities laws. Notwithstanding anything herein to the contrary, if after the sixty (60) calendar day anniversary of the Issuance Date, the Holder is not permitted to exercise this Warrant in full for any reason (other than pursuant to restrictions set forth in Section 1(f) hereof), the Company shall use its best efforts to promptly remedy such failure, including, without limitation, obtaining such consents or approvals as necessary to permit such exercise into Common Shares.

6. WARRANT HOLDER NOT DEEMED A SHAREHOLDER. Except as otherwise specifically provided herein, the Holder, solely in its capacity as a holder of this Warrant, shall not be entitled to vote or receive dividends or be deemed the holder of share capital of the Company for any purpose, nor shall anything contained in this Warrant be construed to confer upon the Holder, solely in its capacity as the Holder of this Warrant, any of the rights of a shareholder of the Company or any right to vote, give or withhold consent to any corporate action (whether any reorganization, issue of shares, reclassification of shares, consolidation, merger, conveyance or otherwise), receive notice of meetings, receive dividends or subscription rights, or otherwise, prior to the issuance to the Holder of the Warrant Shares which it is then entitled to receive upon the due exercise of this Warrant. In addition, nothing contained in this Warrant shall be construed as imposing any liabilities on the Holder to purchase any securities (upon exercise of this Warrant or otherwise) or as a shareholder of the Company, whether such liabilities are asserted by the Company or by creditors of the Company. Notwithstanding this Section 6, the Company shall provide the Holder with copies of the same notices and other information given to the shareholders of the Company generally, contemporaneously with the giving thereof to the shareholders.

7. REISSUANCE OF WARRANTS.

(a) Transfer of Warrant. If this Warrant is to be transferred, the Holder shall surrender this Warrant to the Company, whereupon the Company will forthwith issue and deliver upon the order of the Holder a new Warrant (in accordance with Section 7(d)), registered as the Holder may request, representing the right to purchase the number of Warrant Shares being transferred by the Holder and, if less than the total number of Warrant Shares then underlying this Warrant is being transferred, a new Warrant (in accordance with Section 7(d)) to the Holder representing the right to purchase the number of Warrant Shares not being transferred.

(b) Lost, Stolen or Mutilated Warrant. Upon receipt by the Company of evidence reasonably satisfactory to the Company of the loss, theft, destruction or mutilation of this Warrant (as to which a written certification and the indemnification contemplated below shall suffice as such evidence), and, in the case of loss, theft or destruction, of any indemnification undertaking by the Holder to the Company in customary and reasonable form and, in the case of mutilation, upon surrender and cancellation of this Warrant, the Company shall execute and deliver to the Holder a new Warrant (in accordance with Section 7(d)) representing the right to purchase the Warrant Shares then underlying this Warrant.

(c) Exchangeable for Multiple Warrants. This Warrant is exchangeable, upon the surrender hereof by the Holder at the principal office of the Company, for a new Warrant or Warrants (in accordance with Section 7(d)) representing in the aggregate the right to purchase the number of Warrant Shares then underlying this Warrant, and each such new Warrant will represent the right to purchase such portion of such Warrant Shares as is designated by the Holder at the time of such surrender; provided, however, no warrants for fractional Common Shares shall be given.

(d) Issuance of New Warrants. Whenever the Company is required to issue a new Warrant pursuant to the terms of this Warrant, such new Warrant (i) shall be of like tenor with this Warrant, (ii) shall represent, as indicated on the face of such new Warrant, the right to purchase the Warrant Shares then underlying this Warrant (or in the case of a new Warrant being issued pursuant to Section 7(a) or Section 7(c), the Warrant Shares designated by the Holder which, when added to the number of Common Shares underlying the other new Warrants issued in connection with such issuance, does not exceed the number of Warrant Shares then underlying this Warrant), (iii) shall have an issuance date, as indicated on the face of such new Warrant which is the same as the Issuance Date, and (iv) shall have the same rights and conditions as this Warrant.

8. NOTICES. (a) General. Whenever notice is required to be given under this Warrant, unless otherwise provided herein, such notice shall be given in writing, (i) if delivered (a) from within the domestic United States, by first-class registered or certified airmail, or nationally recognized overnight express courier, postage prepaid, electronic mail or by facsimile or (b) from outside the United States, by International Federal Express, electronic mail or facsimile, and (ii) will be deemed given (A) if delivered by first-class registered or certified mail domestic, three (3) Business Days after so mailed, (B) if delivered by nationally recognized overnight carrier, one (1) Business Day after so mailed, (C) if delivered by International Federal Express, two (2) Business Days after so mailed and (D) if delivered by electronic mail, when sent (provided that such sent email is kept on file (whether electronically or otherwise) by the sending party and the sending party does not receive an automatically generated message from the recipient's email server that such e-mail could not be delivered to such recipient) and (E) if delivered by facsimile, upon electronic confirmation of receipt of such facsimile, and will be delivered and addressed as follows:

(i) if to the Company, to:

Bone Biologics Corporation
2 Burlington Woods Drive, Suite 100
Burlington, MA 01803
Attention: Jeffrey Frelick, CEO
Email: ###

with a copy (which shall not constitute notice) to:

TroyGould PC
1801 Century Park East, 16th Floor
Los Angeles, CA 90067
Attention: David Ficksman, Esq.
Email: ###

(ii) if to the Holder, at such address or other contact information delivered by the Holder to Company or as is on the books and records of the Company.

(b) Required Notices. The Company shall provide the Holder with prompt written notice of all actions taken pursuant to this Warrant (other than the issuance of Common Shares upon exercise in accordance with the terms hereof), including in reasonable detail a description of such action and the reason therefor. Without limiting the generality of the foregoing, the Company will give written notice to the Holder (i) immediately upon each adjustment of the Exercise Price and the number of Warrant Shares, setting forth in reasonable detail, and certifying, the calculation of such adjustment(s), (ii) at least ten (10) Trading Days prior to the date on which the Company closes its books or takes a record (A) with respect to any dividend or distribution upon the Common Shares, (B) with respect to any grants, issuances or sales of any Options, Convertible Securities or rights to purchase shares, warrants, securities or other property to holders of Common Shares or (C) for determining rights to vote with respect to any Fundamental Transaction, dissolution or liquidation, provided in each case that such information shall be made known to the public prior to or in conjunction with such notice being provided to the Holder, and (iii) at least ten (10) Trading Days prior to the consummation of any Fundamental Transaction. To the extent that any notice provided hereunder constitutes, or contains, material, non-public information regarding the Company or any of its Subsidiaries, the Company shall simultaneously file such notice with the SEC pursuant to a Current Report on Form 8-K. It is expressly understood and agreed that the time of execution specified by the Holder in each Exercise Notice shall be definitive and may not be disputed or challenged by the Company.

9. AMENDMENT AND WAIVER. Except as otherwise provided herein, the provisions of this Warrant (other than Section 1(f)) may be amended and the Company may take any action herein prohibited, or omit to perform any act herein required to be performed by it, only if the Company has obtained the written consent of the Holder. No waiver shall be effective unless it is in writing and signed by an authorized representative of the waiving party.

10. SEVERABILITY. If any provision of this Warrant is prohibited by law or otherwise determined to be invalid or unenforceable by a court of competent jurisdiction, the provision that would otherwise be prohibited, invalid or unenforceable shall be deemed amended to apply to the broadest extent that it would be valid and enforceable, and the invalidity or unenforceability of such provision shall not affect the validity of the remaining provisions of this Warrant so long as this Warrant as so modified continues to express, without material change, the original intentions of the parties as to the subject matter hereof and the prohibited nature, invalidity or unenforceability of the provision(s) in question does not substantially impair the respective expectations or reciprocal obligations of the parties or the practical realization of the benefits that would otherwise be conferred upon the parties. The parties will endeavor in good faith negotiations to replace the prohibited, invalid or unenforceable provision(s) with a valid provision(s), the effect of which comes as close as possible to that of the prohibited, invalid or unenforceable provision(s).

11. GOVERNING LAW. This Warrant shall be governed by and construed and enforced in accordance with, and all questions concerning the construction, validity, interpretation and performance of this Warrant shall be governed by, the internal laws of the State of New York, without giving effect to any choice of law or conflict of law provision or rule (whether of the State of New York or any other jurisdictions) that would cause the application of the laws of any jurisdictions other than the State of New York. The Company hereby irrevocably waives personal service of process and consents to process being served in any such suit, action or proceeding by mailing a copy thereof to the Company at its principal executive office and agrees that such service shall constitute good and sufficient service of process and notice thereof. The Company hereby irrevocably submits to the exclusive jurisdiction of the state and federal courts sitting in The City of New York, Borough of Manhattan, for the adjudication of any dispute hereunder or in connection herewith or with any transaction contemplated hereby or discussed herein, and hereby irrevocably waives, and agrees not to assert in any suit, action or proceeding, any claim that it is not personally subject to the jurisdiction of any such court, that such suit, action or proceeding is brought in an inconvenient forum or that the venue of such suit, action or proceeding is improper. Nothing contained herein shall be deemed to limit in any way any right to serve process in any manner permitted by law. Nothing contained herein shall be deemed or operate to preclude the Holder from bringing suit or taking other legal action against the Company in any other jurisdiction to collect on the Company's obligations to the Holder, to realize on any collateral or any other security for such obligations, or to enforce a judgment or other court ruling in favor of the Holder. **THE COMPANY HEREBY IRREVOCABLY WAIVES ANY RIGHT IT MAY HAVE TO, AND AGREES NOT TO REQUEST, A JURY TRIAL FOR THE ADJUDICATION OF ANY DISPUTE HEREUNDER OR IN CONNECTION WITH OR ARISING OUT OF THIS WARRANT OR ANY TRANSACTION CONTEMPLATED HEREBY.**

12. CONSTRUCTION; HEADINGS. This Warrant shall be deemed to be jointly drafted by the Company and the Holder and shall not be construed against any Person as the drafter hereof. The headings of this Warrant are for convenience of reference and shall not form part of, or affect the interpretation of, this Warrant.

13. DISPUTE RESOLUTION.

(a) Submission to Dispute Resolution.

(i) In the case of a dispute relating to the Exercise Price, the Closing Sale Price, the Bid Price, Black Scholes Value or fair market value or the arithmetic calculation of the number of Warrant Shares (as the case may be) (including, without limitation, a dispute relating to the determination of any of the foregoing), the Company or the Holder (as the case may be) shall submit the dispute to the other party via facsimile or electronic mail (A) if by the Company, within two (2) Business Days after the occurrence of the circumstances giving rise to such dispute or (B) if by the Holder, at any time after the Holder learned of the circumstances giving rise to such dispute. If the Holder and the Company are unable to promptly resolve such dispute relating to such Exercise Price, such Closing Sale Price, such Bid Price, Black Scholes Value or such fair market value or such arithmetic calculation of the number of Warrant Shares (as the case may be), at any time after the second (2nd) Business Day following such initial notice by the Company or the Holder (as the case may be) of such dispute to the Company or the Holder (as the case may be), then the Holder may, at its sole option, select an independent, reputable investment bank to resolve such dispute.

(ii) The Holder and the Company shall each deliver to such investment bank (A) a copy of the initial dispute submission so delivered in accordance with the first sentence of this Section 13 and (B) written documentation supporting its position with respect to such dispute, in each case, no later than 5:00 p.m. (New York time) by the fifth (5th) Business Day immediately following the date on which the Holder selected such investment bank (the “**Dispute Submission Deadline**”) (the documents referred to in the immediately preceding clauses (A) and (B) are collectively referred to herein as the “**Required Dispute Documentation**”) (it being understood and agreed that if either the Holder or the Company fails to so deliver all of the Required Dispute Documentation by the Dispute Submission Deadline, then the party who fails to so submit all of the Required Dispute Documentation shall no longer be entitled to (and hereby waives its right to) deliver or submit any written documentation or other support to such investment bank with respect to such dispute and such investment bank shall resolve such dispute based solely on the Required Dispute Documentation that was delivered to such investment bank prior to the Dispute Submission Deadline). Unless otherwise agreed to in writing by both the Company and the Holder or otherwise requested by such investment bank, neither the Company nor the Holder shall be entitled to deliver or submit any written documentation or other support to such investment bank in connection with such dispute (other than the Required Dispute Documentation).

(iii) The Company and the Holder shall cause such investment bank to determine the resolution of such dispute and notify the Company and the Holder of such resolution no later than ten (10) Business Days immediately following the Dispute Submission Deadline. The fees and expenses of such investment bank shall be borne solely by the Company, and such investment bank’s resolution of such dispute shall be final and binding upon all parties absent manifest error.

(b) Miscellaneous. The Company expressly acknowledges and agrees that (i) this Section 13 constitutes an agreement to arbitrate between the Company and the Holder (and constitutes an arbitration agreement) under the rules then in effect under § 7501, et seq. of the New York Civil Practice Law and Rules (“**CPLR**”) and that the Holder is authorized to apply for an order to compel arbitration pursuant to CPLR § 7503(a) in order to compel compliance with this Section 13, (ii) the terms of this Warrant shall serve as the basis for the selected investment bank’s resolution of the applicable dispute, such investment bank shall be entitled (and is hereby expressly authorized) to make all findings, determinations and the like that such investment bank determines are required to be made by such investment bank in connection with its resolution of such dispute and in resolving such dispute such investment bank shall apply such findings, determinations and the like to the terms of this Warrant, (iii) the Holder (and only the Holder), in its sole discretion, shall have the right to submit any dispute described in this Section 13 to any state or federal court sitting in The City of New York, Borough of Manhattan in lieu of utilizing the procedures set forth in this Section 13 and (iv) nothing in this Section 13 shall limit the Holder from obtaining any injunctive relief or other equitable remedies (including, without limitation, with respect to any matters described in this Section 13).

14. REMEDIES, CHARACTERIZATION, OTHER OBLIGATIONS, BREACHES AND INJUNCTIVE RELIEF. The remedies provided in this Warrant shall be cumulative and in addition to all other remedies available under this Warrant, at law or in equity (including a decree of specific performance and/or other injunctive relief), and nothing herein shall limit the right of the Holder to pursue actual and consequential damages for any failure by the Company to comply with the terms of this Warrant. The Company covenants to the Holder that there shall be no characterization concerning this instrument other than as expressly provided herein. Amounts set forth or provided for herein with respect to payments, exercises and the like (and the computation thereof) shall be the amounts to be received by the Holder and shall not, except as expressly provided herein, be subject to any other obligation of the Company (or the performance thereof). The Company acknowledges that a breach by it of its obligations hereunder will cause irreparable harm to the Holder and that the remedy at law for any such breach may be inadequate. The Company therefore agrees that, in the event of any such breach or threatened breach, the holder of this Warrant shall be entitled, in addition to all other available remedies, to specific performance and/or temporary, preliminary and permanent injunctive or other equitable relief from any court of competent jurisdiction in any such case without the necessity of proving actual damages and without posting a bond or other security. The Company shall provide all information and documentation to the Holder that is requested by the Holder to enable the Holder to confirm the Company’s compliance with the terms and conditions of this Warrant (including, without limitation, compliance with Section 2 hereof). The issuance of shares and certificates for shares as contemplated hereby upon the exercise of this Warrant shall be made without charge to the Holder or such shares for any issuance tax or other costs in respect thereof, provided that the Company shall not be required to pay any tax which may be payable in respect of any transfer involved in the issuance and delivery of any certificate in a name other than the Holder or its agent on its behalf.

15. PAYMENT OF COLLECTION, ENFORCEMENT AND OTHER COSTS. If (a) this Warrant is placed in the hands of an attorney for collection or enforcement or is collected or enforced through any legal proceeding or the holder otherwise takes action to collect amounts due under this Warrant or to enforce the provisions of this Warrant or (b) there occurs any bankruptcy, reorganization, receivership of the company or other proceedings affecting company creditors’ rights and involving a claim under this Warrant, then the Company shall pay the costs incurred by the Holder for such collection, enforcement or action or in connection with such bankruptcy, reorganization, receivership or other proceeding, including, without limitation, attorneys’ fees and disbursements.

16. TRANSFER. This Warrant may be offered for sale, sold, transferred or assigned without the consent of the Company.

17. CERTAIN DEFINITIONS. For purposes of this Warrant, the following terms shall have the following meanings:

(a) “**1933 Act**” means the Securities Act of 1933, as amended, and the rules and regulations thereunder.

(b) “**1934 Act**” means the Securities Exchange Act of 1934, as amended, and the rules and regulations thereunder.

(c) “**Affiliate**” means, with respect to any Person, any other Person that directly or indirectly controls, is controlled by, or is under common control with, such Person, it being understood for purposes of this definition that “control” of a Person means the power directly or indirectly either to vote 10% or more of the shares having ordinary voting power for the election of directors of such Person or direct or cause the direction of the management and policies of such Person whether by contract or otherwise.

(d) “**Attribution Parties**” means, collectively, the following Persons and entities: (i) any investment vehicle, including, any funds, feeder funds or managed accounts, currently, or from time to time after the Issuance Date, directly or indirectly managed or advised by the Holder’s investment manager or any of its Affiliates or principals, (ii) any direct or indirect Affiliates of the Holder or any of the foregoing, (iii) any Person acting or who could be deemed to be acting as a Group together with the Holder or any of the foregoing and (iv) any other Persons whose beneficial ownership of the Company’s Common Shares would or could be aggregated with the Holder’s and the other Attribution Parties for purposes of Section 13(d) of the 1934 Act. For clarity, the purpose of the foregoing is to subject collectively the Holder and all other Attribution Parties to the Maximum Percentage.

(e) “**Bid Price**” means, for any security as of the particular time of determination, the bid price for such security on the Principal Market as reported by Bloomberg as of such time of determination, or, if the Principal Market is not the principal securities exchange or trading market for such security, the bid price of such security on the principal securities exchange or trading market where such security is listed or traded as reported by Bloomberg as of such time of determination, or if the foregoing does not apply, the bid price of such security in the over-the-counter market on the electronic bulletin board for such security as reported by Bloomberg as of such time of determination, or, if no bid price is reported for such security by Bloomberg as of such time of determination, the average of the bid prices of any market makers for such security as reported in the “pink sheets” by OTC Markets Group Inc. (formerly Pink Sheets LLC) as of such time of determination. If the Bid Price cannot be calculated for a security as of the particular time of determination on any of the foregoing bases, the Bid Price of such security as of such time of determination shall be the fair market value as mutually determined by the Company and the Holder. If the Company and the Holder are unable to agree upon the fair market value of such security, then such dispute shall be resolved in accordance with the procedures in Section 13. All such determinations shall be appropriately adjusted for any shares dividend, share split, share combination or other similar transaction during such period.

(g) “**Bloomberg**” means Bloomberg, L.P.

(h) “**Business Day**” means any day other than Saturday, Sunday or other day on which commercial banks in The City of New York are authorized or required by law to remain closed; provided, however, for clarification, commercial banks shall not be deemed to be authorized or required by law to remain closed due to “stay at home”, “shelter-in-place”, “non-essential employee” or any other similar orders or restrictions or the closure of any physical branch locations at the direction of any governmental authority so long as the electronic funds transfer systems (including for wire transfers) of commercial banks in The City of New York generally are open for use by customers on such day.

(i) “**Closing Sale Price**” means, for any security as of any date, the last closing trade price for such security on the Principal Market, as reported by Bloomberg, or, if the Principal Market begins to operate on an extended hours basis and does not designate the closing trade price, then the last trade price of such security prior to 4:00:00 p.m., New York time, as reported by Bloomberg, or, if the Principal Market is not the principal securities exchange or trading market for such security, the last trade price of such security on the principal securities exchange or trading market where such security is listed or traded as reported by Bloomberg, or if the foregoing does not apply, the last trade price of such security in the over-the-counter market on the electronic bulletin board for such security as reported by Bloomberg, or, if no last trade price is reported for such security by Bloomberg, the average of the ask prices of any market makers for such security as reported in the “pink sheets” by OTC Markets Group Inc. (formerly Pink Sheets LLC). If the Closing Sale Price cannot be calculated for a security on a particular date on any of the foregoing bases, the Closing Sale Price of such security on such date shall be the fair market value as mutually determined by the Company and the Holder. If the Company and the Holder are unable to agree upon the fair market value of such security, then such dispute shall be resolved in accordance with the procedures in Section 13. All such determinations shall be appropriately adjusted for any share dividend, share split, share combination or other similar transaction during such period.

(j) “**Common Shares**” means (i) the Company’s common shares, par value \$0.0001 per share, and (ii) any capital shares into which such common shares shall have been changed or any share capital resulting from a reclassification of such common shares.

(k) “**Convertible Securities**” means any shares or other security (other than Options) that is at any time and under any circumstances, directly or indirectly, convertible into, exercisable or exchangeable for, or which otherwise entitles the holder thereof to acquire, any Common Shares.

(l) “**Eligible Market**” means The New York Stock Exchange, the NYSE American, the Nasdaq Global Select Market, the Nasdaq Global Market, the Nasdaq Capital Market or the Principal Market.

(m) “**Expiration Date**” means the date that is the fifth (5th) anniversary of the Issuance Date or, if such date falls on a day other than a Business Day or on which trading does not take place on the Principal Market (a “**Holiday**”), the next date that is not a Holiday.

(n) Intentionally Omitted.

(o) “**Group**” means a “group” as that term is used in Section 13(d) of the 1934 Act and as defined in Rule 13d-5 thereunder.

(p) “**Options**” means any rights, warrants or options to subscribe for or purchase Common Shares or Convertible Securities.

(q) “**Parent Entity**” of a Person means an entity that, directly or indirectly, controls the applicable Person and whose common stock or equivalent equity security is quoted or listed on an Eligible Market, or, if there is more than one such Person or Parent Entity, the Person or Parent Entity with the largest public market capitalization as of the date of consummation of the Fundamental Transaction.

(r) “**Person**” means an individual, a limited liability company, a partnership, a joint venture, a corporation, a trust, an unincorporated organization, any other entity or a government or any department or agency thereof.

(s) “**Principal Market**” means the Nasdaq Capital Market.

(t) “**SEC**” means the United States Securities and Exchange Commission or the successor thereto.

(u) “**Spot Price**” means, as applicable: (i) the Closing Sale Price of the Common Shares on the Trading Day immediately preceding the date of the applicable Exercise Notice if such Exercise Notice is (1) both executed and delivered pursuant to Section 1(a) hereof on a day that is not a Trading Day or (2) both executed and delivered pursuant to Section 1(a) hereof on a Trading Day prior to the opening of “regular trading hours” (as defined in Rule 600(b)(64) of Regulation NMS promulgated under the federal securities laws) on such Trading Day, (ii) the Bid Price of the Common Shares as of the time of the Holder’s execution of the applicable Exercise Notice if such Exercise Notice is executed during “regular trading hours” on a Trading Day and is delivered within two (2) hours thereafter pursuant to Section 1(a) hereof, or (iii) the Closing Sale Price of the Common Shares on the date of the applicable Exercise Notice if the date of such Exercise Notice is a Trading Day and such Exercise Notice is both executed and delivered pursuant to Section 1(a) hereof after the close of “regular trading hours” on such Trading Day.

(v) “**Subject Entity**” means any Person, Persons or Group or any Affiliate or associate of any such Person, Persons or Group.

(w) “**Trading Day**” means, as applicable, (x) with respect to all price or trading volume determinations relating to the Common Shares, any day on which the Common Shares is traded on the Principal Market, or, if the Principal Market is not the principal trading market for the Common Shares, then on the principal securities exchange or securities market on which the Common Shares is then traded, provided that “Trading Day” shall not include any day on which the Common Shares is scheduled to trade on such exchange or market for less than 4.5 hours or any day that the Common Shares is suspended from trading during the final hour of trading on such exchange or market (or if such exchange or market does not designate in advance the closing time of trading on such exchange or market, then during the hour ending at 4:00:00 p.m., New York time) unless such day is otherwise designated as a Trading Day in writing by the Holder or (y) with respect to all determinations other than price determinations relating to the Common Shares, any day on which The New York Stock Exchange (or any successor thereto) is open for trading of securities.

(x) “**VWAP**” means, for any security as of any date, the dollar volume-weighted average price for such security on the Principal Market (or, if the Principal Market is not the principal trading market for such security, then on the principal securities exchange or securities market on which such security is then traded) during the period beginning at 9:30:01 a.m., New York time, and ending at 4:00:00 p.m., New York time, as reported by Bloomberg through its “HP” function (set to weighted average) or, if the foregoing does not apply, the dollar volume-weighted average price of such security in the over-the-counter market on the electronic bulletin board for such security during the period beginning at 9:30:01 a.m., New York time, and ending at 4:00:00 p.m., New York time, as reported by Bloomberg, or, if no dollar volume-weighted average price is reported for such security by Bloomberg for such hours, the average of the highest closing bid price and the lowest closing ask price of any of the market makers for such security as reported in the “pink sheets” by OTC Markets Group Inc. (formerly Pink Sheets LLC). If the V’ATAP cannot be calculated for such security on such date on any of the foregoing bases, the V’ATAP of such security on such date shall be the fair market value as mutually determined by the Company and the Holder. If the Company and the Holder are unable to agree upon the fair market value of such security, then such dispute shall be resolved in accordance with the procedures in Section 13. All such determinations shall be appropriately adjusted for any share dividend, share split, share combination, recapitalization or other similar transaction during such period.

(Signature Page Follows)

IN WITNESS WHEREOF, the Company has caused this Warrant to be executed by its officer thereunto duly authorized as of the date first above indicated.

BONE BIOLOGICS CORPORATION

By: _____
Name: Jeffrey Frelick
Title: Chief Executive Officer

EXHIBIT A

NOTICE OF EXERCISE

TO: BONE BIOLOGICS CORPORATION

(1) The undersigned hereby elects to purchase _____ Warrant Shares of the Company pursuant to the terms of the attached Warrant (only if exercised in full), and tenders herewith payment of the exercise price in full, together with all applicable transfer taxes, if any.

(2) Payment shall take the form of (check applicable box):

- ☐ in lawful money of the United States; or
- ☐ if permitted the cancellation of such number of Warrant Shares as is necessary, in accordance with the formula set forth in subsection 1(d), to exercise this Warrant with respect to the maximum number of Warrant Shares purchasable pursuant to the cashless exercise procedure set forth in subsection 1(d).

(3) Please issue said Warrant Shares in the name of the undersigned or in such other name as is specified below:

The Warrant Shares shall be delivered to the following DWAC Account Number:

[SIGNATURE OF HOLDER]

Name of Investing Entity:

*Signature of Authorized
Signatory of Investing Entity:*

Name of Authorized Signatory:

Title of Authorized Signatory:

NOTICE OF EXERCISE

TO BE EXECUTED BY THE REGISTERED HOLDER TO EXERCISE THIS WARRANT TO PURCHASE COMMON SHARES

Date: _____, 20____

TO: BONE BIOLOGICS CORPORATION

The undersigned holder hereby exercises the right to purchase _____ of Common Shares (“**Warrant Shares**”) of Bone Biologics Corporation, a Delaware corporation (the “**Company**”), evidenced by Warrant to Purchase Common Shares No. _____ (the “**Warrant**”). Capitalized terms used herein and not otherwise defined shall have the respective meanings set forth in the Warrant.

1. Form of Exercise Price. The Holder intends that payment of the Aggregate Exercise Price shall be made as:

_____ a “Cash Exercise” with respect to _____ Warrant Shares; and/or

_____ a “Cashless Exercise” with respect to _____ Warrant Shares.

In the event that the Holder has elected a Cashless Exercise with respect to some or all of the Warrant Shares to be issued pursuant hereto, the Holder hereby represents and warrants that (i) this Exercise Notice was executed by the Holder at _____ [a.m.][p.m.] on the date set forth below and (ii) if applicable, the Bid Price as of such time of execution of this Exercise Notice was \$ _____.

2. Payment of Exercise Price. In the event that the Holder has elected a Cash Exercise with respect to some or all of the Warrant Shares to be issued pursuant hereto, the Holder shall pay the Aggregate Exercise Price in the sum of \$ _____ to the Company in accordance with the terms of the Warrant.

3. Delivery of Warrant Shares. The Company shall deliver to Holder, or its designee or agent as specified below, _____ Warrant Shares in accordance with the terms of the Warrant. Delivery shall be made to Holder, or for its benefit, as follows:

[] Check here if requesting delivery as a certificate to the following name and to the following address:

Issue
to: _____

[] Check here if requesting delivery by Deposit/Withdrawal at Custodian as follows:

DTC Participant:

DTC Number:

Account Number:

Name of Registered Holder

By:

Tax ID:

Name:

Email:

Title:

Telephone:

Facsimile:

EXHIBIT B

Bank Name:
Account Name:
Account Number:
Routing Number:
Bank Address:
Account Address:

EXHIBIT C

ACKNOWLEDGMENT

The Company hereby acknowledges this Exercise Notice and hereby directs _____ to issue the above indicated number of Common Shares in accordance with the Transfer Agent Instructions dated _____, 20____, from the Company and acknowledged and agreed to by _____.

BONE BIOLOGICS CORPORATION

By: _____
Name:
Title:

ASSIGNMENT FORM

(To assign the foregoing Warrant, execute this form and supply required information. Do not use this form to purchase shares.)

FOR VALUE RECEIVED, the foregoing Warrant and all rights evidenced thereby are hereby assigned to

Name:

(Please Print)

Address:

(Please Print)

Phone Number:

Email Address:

Dated:

Holder's Signature:

Holder's Address:

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Form of Warrant Certificate Request Notice

WARRANT CERTIFICATE REQUEST NOTICE

To: Equiniti ____, as Warrant Agent for Bone Biologics Corporation (the “Company”)

The undersigned Holder of Common Stock Purchase Warrants (“Warrants”) in the form of Global Warrants issued by the Company hereby elects to receive a Definitive Certificate evidencing the Warrants held by the Holder as specified below:

- 1) Name of Holder of Warrants in form of Global Warrants:
- 2) Name of Holder in Definitive Certificate (if different from name of Holder of Warrants in form of Global Warrants):
- 3) Number of Warrants in name of Holder in form of Global Warrants:
- 4) Number of Warrants for which Definitive Certificate shall be issued:
- 5) Number of Warrants in name of Holder in form of Global Warrants after issuance of Definitive Certificate, if any:
- 6) Definitive Certificate shall be delivered to the following address:

The undersigned hereby acknowledges and agrees that, in connection with this Warrant Exchange and the issuance of the Definitive Certificate, the Holder is deemed to have surrendered the number of Warrants in form of Global Warrants in the name of the Holder equal to the number of Warrants evidenced by the Definitive Certificate.

[SIGNATURE OF HOLDER]

Name of Investing Entity:
Signature of Authorized Signatory of
Investing Entity:
Name of Authorized Signatory:
Title of Authorized Signatory:
Date:

[FORM OF SERIES A COMMON STOCK PURCHASE WARRANT]**BONE BIOLOGICS CORPORATION
SERIES A COMMON STOCK PURCHASE WARRANT**

Warrant Shares: _____

Initial Exercise Date: October 12, 2022

THIS SERIES A COMMON STOCK PURCHASE WARRANT (the “Warrant”) certifies that, for value received, [_____] or its assigns (the “Holder”) is entitled, upon the terms and subject to the limitations on exercise and the conditions hereinafter set forth, at any time on or after the date hereof (the “Initial Exercise Date”) and on or prior to 5:00 p.m. (New York City time) on October 12, 2027 (the “Termination Date”) but not thereafter, to subscribe for and purchase from Bone Biologics Corporation, a Delaware corporation (the “Company”), up to [_____] shares (as subject to adjustment hereunder, the “Warrant Shares”) of Common Stock. The purchase price of one share of Common Stock under this Warrant shall be equal to the Exercise Price, as defined in Section 2(b). This Warrant shall initially be issued and maintained in the form of a security held in book-entry form and the Depository Trust Company or its nominee (“DTC”) shall initially be the sole registered holder of this Warrant, subject to a Holder’s right to elect to receive a Warrant in certificated form pursuant to the terms of the Warrant Agency Agreement, in which case this sentence shall not apply.

Section 1. Definitions. In addition to the terms defined elsewhere in this Warrant, the following terms have the meanings indicated in this Section 1:

“Affiliate” means any Person that, directly or indirectly through one or more intermediaries, controls or is controlled by or is under common control with a Person, as such terms are used in and construed under Rule 405 under the Securities Act.

“Bid Price” means, for any date, the price determined by the first of the following clauses that applies: (a) if the Common Stock is then listed or quoted on a Trading Market, the bid price of the Common Stock for the time in question (or the nearest preceding date) on the Trading Market on which the Common Stock is then listed or quoted as reported by Bloomberg L.P. (based on a Trading Day from 9:30 a.m. (New York City time) to 4:02 p.m. (New York City time)), (b) if OTCQB or OTCQX is not a Trading Market, the volume weighted average price of the Common Stock for such date (or the nearest preceding date) on OTCQB or OTCQX as applicable, (c) if the Common Stock is not then listed or quoted for trading on OTCQB or OTCQX and if prices for the Common Stock are then reported on the Pink Open Market (or a similar organization or agency succeeding to its functions of reporting prices), the most recent bid price per share of the Common Stock so reported, or (d) in all other cases, the fair market value of a share of Common Stock as determined by an independent appraiser selected in good faith by the Holders of a majority in interest of the Warrants then outstanding and reasonably acceptable to the Company, the fees and expenses of which shall be paid by the Company.

“Business Day” means any day other than Saturday, Sunday or other day on which commercial banks in The City of New York are authorized or required by law to remain closed; provided, however, for clarification, commercial banks shall not be deemed to be authorized or required by law to remain closed due to “stay at home”, “shelter-in-place”, “non-essential employee” or any other similar orders or restrictions or the closure of any physical branch locations at the direction of any governmental authority so long as the electronic funds transfer systems (including for wire transfers) of commercial banks in The City of New York generally are open for use by customers on such day.

“Commission” means the United States Securities and Exchange Commission.

“Common Stock” means the common stock of the Company, par value \$0.001 per share, and any other class of securities into which such securities may hereafter be reclassified or changed.

“Exchange Act” means the Securities Exchange Act of 1934, as amended, and the rules and regulations promulgated thereunder.

“Person” means an individual or corporation, partnership, trust, incorporated or unincorporated association, joint venture, limited liability company, joint stock company, government (or an agency or subdivision thereof) or other entity of any kind.

“Registration Statement” means the Company’s registration statement on Form S-1 (File No. 333-267588).

“Securities Act” means the Securities Act of 1933, as amended, and the rules and regulations promulgated thereunder.

“Subsidiary” means any subsidiary of the Company and shall, where applicable, also include any direct or indirect subsidiary of the Company formed or acquired after the date hereof.

“Trading Day” means a day on which the Common Stock is traded on a Trading Market.

“Trading Market” means any of the following markets or exchanges on which the Common Stock is listed or quoted for trading on the date in question: the NYSE American, the Nasdaq Capital Market, the Nasdaq Global Market, the Nasdaq Global Select Market, the New York Stock Exchange, OTCQB or OTCQX (or any successors to any of the foregoing).

“Transfer Agent” means Equiniti Trust Company, the current transfer agent of the Company, with a mailing address of 1110 Centre Pointe Curve, Mendota Heights, MN 55120, and any successor transfer agent of the Company.

“Underwriting Agreement” means the underwriting agreement, dated as of October 7, 2022, among the Company and WallachBeth Capital, LLC as representative of the underwriters named therein, as amended, modified or supplemented from time to time in accordance with its terms.

“VWAP” means, for any date, the price determined by the first of the following clauses that applies: (a) if the Common Stock is then listed or quoted on a Trading Market, the daily volume weighted average price of the Common Stock for such date (or the nearest preceding date) on the Trading Market on which the Common Stock is then listed or quoted as reported by Bloomberg L.P. (based on a Trading Day from 9:30 a.m. (New York City time) to 4:02 p.m. (New York City time)), (b) if OTCQB or OTCQX is not a Trading Market, the volume weighted average price of the Common Stock for such date (or the nearest preceding date) on OTCQB or OTCQX as applicable, (c) if the Common Stock is not then listed or quoted for trading on OTCQB or OTCQX and if prices for the Common Stock are then reported on the Pink Open Market (or a similar organization or agency succeeding to its functions of reporting prices), the most recent bid price per share of the Common Stock so reported, or (d) in all other cases, the fair market value of a share of Common Stock as determined by an independent appraiser selected in good faith by the holders of a majority in interest of the Common Stock Purchase Warrants then outstanding and reasonably acceptable to the Company, the fees and expenses of which shall be paid by the Company.

“Warrant Agency Agreement” means that certain warrant agent agreement, dated on or about the Initial Exercise Date, between the Company and the Warrant Agent.

“Warrant Agent” means the Transfer Agent and any successor warrant agent of the Company.

“Warrants” means this Warrant and other Common Stock purchase warrants issued by the Company pursuant to the Registration Statement.

Section 2. Exercise.

- a) Exercise of Warrant. Exercise of the purchase rights represented by this Warrant may be made, in whole or in part, at any time or times on or after the Initial Exercise Date and on or before the Termination Date by delivery to the Company of a duly executed PDF copy submitted by e-mail (or e-mail attachment) of the Notice of Exercise in the form annexed hereto (the “Notice of Exercise”). Within the earlier of (i) two (2) Trading Days and (ii) the number of Trading Days comprising the Standard Settlement Period (as defined in Section 2(d)(i) herein) following the date of exercise as aforesaid, the Holder shall deliver the aggregate Exercise Price for the shares specified in the applicable Notice of Exercise by wire transfer or cashier’s check drawn on a United States bank unless the cashless exercise procedure specified in Section 2(c) below is specified in the applicable Notice of Exercise. No ink-original Notice of Exercise shall be required, nor shall any medallion guarantee (or other type of guarantee or notarization) of any Notice of Exercise be required. Notwithstanding anything herein to the contrary, the Holder shall not be required to physically surrender this Warrant to the Company until the Holder has purchased all of the Warrant Shares available hereunder and the Warrant has been exercised in full, in which case, the Holder shall surrender this Warrant to the Company for cancellation within three (3) Trading Days of the date on which the final Notice of Exercise is delivered to the Company. Partial exercises of this Warrant resulting in purchases of a portion of the total number of Warrant Shares available hereunder shall have the effect of lowering the outstanding number of Warrant Shares purchasable hereunder in an amount equal to the applicable number of Warrant Shares purchased. The Holder and the Company shall maintain records showing the number of Warrant Shares purchased and the date of such purchases. The Company shall deliver any objection to any Notice of Exercise within one (1) Business Day of receipt of such notice. **The Holder and any assignee, by acceptance of this Warrant, acknowledge and agree that, by reason of the provisions of this paragraph, following the purchase of a portion of the Warrant Shares hereunder, the number of Warrant Shares available for purchase hereunder at any given time may be less than the amount stated on the face hereof.**

Notwithstanding the foregoing in this Section 2(a), a holder whose interest in this Warrant is a beneficial interest in certificate(s) representing this Warrant held in book-entry form through DTC (or another established clearing corporation performing similar functions), shall effect exercises made pursuant to this Section 2(a) by delivering to DTC (or such other clearing corporation, as applicable) the appropriate instruction form for exercise, complying with the procedures to effect exercise that are required by DTC (or such other clearing corporation, as applicable), subject to a Holder's right to elect to receive a Warrant in certificated form pursuant to the terms of the Warrant Agency Agreement, in which case this sentence shall not apply.

b) Exercise Price. The exercise price per share of Common Stock under this Warrant shall be \$1.62, subject to adjustment hereunder (the "Exercise Price").

c) Cashless Exercise. If at the time of exercise hereof there is no effective registration statement registering, or the prospectus contained therein is not available for the issuance of the Warrant Shares to the Holder, then this Warrant may also be exercised, in whole or in part, at such time by means of a "cashless exercise" in which the Holder shall be entitled to receive a number of Warrant Shares equal to the quotient obtained by dividing $[(A-B) (X)]$ by (A), where:

(A) = as applicable: (i) the VWAP on the Trading Day immediately preceding the date of the applicable Notice of Exercise if such Notice of Exercise is (1) both executed and delivered pursuant to Section 2(a) hereof on a day that is not a Trading Day or (2) both executed and delivered pursuant to Section 2(a) hereof on a Trading Day prior to the opening of "regular trading hours" (as defined in Rule 600(b) of Regulation NMS promulgated under the federal securities laws) on such Trading Day, (ii) at the option of the Holder, either (y) the VWAP on the Trading Day immediately preceding the date of the applicable Notice of Exercise or (z) the Bid Price of the Common Stock on the principal Trading Market as reported by Bloomberg L.P. as of the time of the Holder's execution of the applicable Notice of Exercise if such Notice of Exercise is executed during "regular trading hours" on a Trading Day and is delivered within two (2) hours thereafter (including until two (2) hours after the close of "regular trading hours" on a Trading Day) pursuant to Section 2(a) hereof or (iii) the VWAP on the date of the applicable Notice of Exercise if the date of such Notice of Exercise is a Trading Day and such Notice of Exercise is both executed and delivered pursuant to Section 2(a) hereof after the close of "regular trading hours" on such Trading Day;

(B) = the Exercise Price of this Warrant, as adjusted hereunder; and

(X) = the number of Warrant Shares that would be issuable upon exercise of this Warrant in accordance with the terms of this Warrant if such exercise were by means of a cash exercise rather than a cashless exercise.

If Warrant Shares are issued in such a cashless exercise, the parties acknowledge and agree that in accordance with Section 3(a)(9) of the Securities Act, the Warrant Shares shall take on the registered characteristics of the Warrants being exercised. The Company agrees not to take any position contrary to this Section 2(c).

d) Mechanics of Exercise.

i. Delivery of Warrant Shares Upon Exercise. The Company shall cause the Warrant Shares purchased hereunder to be transmitted by the Transfer Agent to the Holder by crediting the account of the Holder's or its designee's balance account with The Depository Trust Company through its Deposit or Withdrawal at Custodian system ("DWAC") if the Company is then a participant in such system and either (A) there is an effective registration statement permitting the issuance of the Warrant Shares to or resale of the Warrant Shares by Holder or (B) this Warrant is being exercised via cashless exercise, and otherwise by physical delivery of a certificate, registered in the Company's share register in the name of the Holder or its designee, for the number of Warrant Shares to which the Holder is entitled pursuant to such exercise to the address specified by the Holder in the Notice of Exercise by the date that is the earliest of (i) two (2) Trading Days after the delivery to the Company of the Notice of Exercise, (ii) one (1) Trading Day after delivery of the aggregate Exercise Price to the Company and (iii) the number of Trading Days comprising the Standard Settlement Period after the delivery to the Company of the Notice of Exercise (such date, the "Warrant Share Delivery Date"). Upon delivery of the Notice of Exercise, the Holder shall be deemed for all corporate purposes to have become the holder of record of the Warrant Shares with respect to which this Warrant has been exercised, irrespective of the date of delivery of the Warrant Shares, provided that payment of the aggregate Exercise Price (other than in the case of a cashless exercise) is received within the earlier of (i) two (2) Trading Days and (ii) the number of Trading Days comprising the Standard Settlement Period following delivery of the Notice of Exercise. If the Company fails for any reason to deliver to the Holder the Warrant Shares subject to a Notice of Exercise by the Warrant Share Delivery Date, the Company shall pay to the Holder, in cash, as liquidated damages and not as a penalty, for each \$1,000 of Warrant Shares subject to such exercise (based on the VWAP of the Common Stock on the date of the applicable Notice of Exercise), \$10 per Trading Day (increasing to \$20 per Trading Day on the fifth Trading Day after such liquidated damages begin to accrue) for each Trading Day after such Warrant Share Delivery Date until such Warrant Shares are delivered or Holder rescinds such exercise. The Company agrees to maintain a transfer agent that is a participant in the FAST program so long as this Warrant remains outstanding and exercisable. As used herein, "Standard Settlement Period" means the standard settlement period, expressed in a number of Trading Days, on the Company's primary Trading Market with respect to the Common Stock as in effect on the date of delivery of the Notice of Exercise. Notwithstanding the foregoing, with respect to any Notice(s) of Exercise delivered on or prior to 12:00 p.m. (New York City time) on the Initial Exercise Date, which may be delivered at any time after the time of execution of the Underwriting Agreement, the Company agrees to deliver the Warrant Shares subject to such notice(s) by 4:00 p.m. (New York City time) on the Initial Exercise Date and the Initial Exercise Date shall be the Warrant Share Delivery Date for purposes hereunder, provided that payment of the aggregate Exercise Price (other than in the case of a cashless exercise) is received by such Warrant Share Delivery Date.

ii. Delivery of New Warrants Upon Exercise. If this Warrant shall have been exercised in part, the Company shall, at the request of a Holder and upon surrender of this Warrant certificate, at the time of delivery of the Warrant Shares, deliver to the Holder a new Warrant evidencing the rights of the Holder to purchase the unpurchased Warrant Shares called for by this Warrant, which new Warrant shall in all other respects be identical with this Warrant.

iii. Rescission Rights. If the Company fails to cause the Transfer Agent to transmit to the Holder the Warrant Shares pursuant to Section 2(d)(i) by the Warrant Share Delivery Date, then the Holder will have the right to rescind such exercise.

iv. Compensation for Buy-In on Failure to Timely Deliver Warrant Shares Upon Exercise. In addition to any other rights available to the Holder, if the Company fails to cause the Transfer Agent to transmit to the Holder the Warrant Shares in accordance with the provisions of Section 2(d)(i) above pursuant to an exercise on or before the Warrant Share Delivery Date, and if after such date the Holder is required by its broker to purchase (in an open market transaction or otherwise) or the Holder's brokerage firm otherwise purchases, shares of Common Stock to deliver in satisfaction of a sale by the Holder of the Warrant Shares which the Holder anticipated receiving upon such exercise (a "Buy-In"), then the Company shall (A) pay in cash to the Holder the amount, if any, by which (x) the Holder's total purchase price (including brokerage commissions, if any) for the shares of Common Stock so purchased exceeds (y) the amount obtained by multiplying (1) the number of Warrant Shares that the Company was required to deliver to the Holder in connection with the exercise at issue times (2) the price at which the sell order giving rise to such purchase obligation was executed, and (B) at the option of the Holder, either reinstate the portion of the Warrant and equivalent number of Warrant Shares for which such exercise was not honored (in which case such exercise shall be deemed rescinded) or deliver to the Holder the number of shares of Common Stock that would have been issued had the Company timely complied with its exercise and delivery obligations hereunder. For example, if the Holder purchases Common Stock having a total purchase price of \$11,000 to cover a Buy-In with respect to an attempted exercise of shares of Common Stock with an aggregate sale price giving rise to such purchase obligation of \$10,000, under clause (A) of the immediately preceding sentence the Company shall be required to pay the Holder \$1,000. The Holder shall provide the Company written notice indicating the amounts payable to the Holder in respect of the Buy-In and, upon request of the Company, evidence of the amount of such loss. Nothing herein shall limit a Holder's right to pursue any other remedies available to it hereunder, at law or in equity including, without limitation, a decree of specific performance and/or injunctive relief with respect to the Company's failure to timely deliver shares of Common Stock upon exercise of the Warrant as required pursuant to the terms hereof.

v. No Fractional Shares or Scrip. No fractional shares or scrip representing fractional shares shall be issued upon the exercise of this Warrant. As to any fraction of a share which the Holder would otherwise be entitled to purchase upon such exercise, the Company shall, at its election, either pay a cash adjustment in respect of such final fraction in an amount equal to such fraction multiplied by the Exercise Price or round up to the next whole share.

vi. Charges, Taxes and Expenses. Issuance of Warrant Shares shall be made without charge to the Holder for any issue or transfer tax or other incidental expense in respect of the issuance of such Warrant Shares, all of which taxes and expenses shall be paid by the Company, and such Warrant Shares shall be issued in the name of the Holder or in such name or names as may be directed by the Holder; provided, however, that, in the event that Warrant Shares are to be issued in a name other than the name of the Holder, this Warrant when surrendered for exercise shall be accompanied by the Assignment Form attached hereto duly executed by the Holder and the Company may require, as a condition thereto, the payment of a sum sufficient to reimburse it for any transfer tax incidental thereto. The Company shall pay all Transfer Agent fees required for same-day processing of any Notice of Exercise and all fees to the Depository Trust Company (or another established clearing corporation performing similar functions) required for same-day electronic delivery of the Warrant Shares.

vii. Closing of Books. The Company will not close its stockholder books or records in any manner which prevents the timely exercise of this Warrant, pursuant to the terms hereof.

e) Holder's Exercise Limitations. The Company shall not effect any exercise of this Warrant, and a Holder shall not have the right to exercise any portion of this Warrant, pursuant to Section 2 or otherwise, to the extent that after giving effect to such issuance after exercise as set forth on the applicable Notice of Exercise, the Holder (together with the Holder's Affiliates, and any other Persons acting as a group together with the Holder or any of the Holder's Affiliates (such Persons, "Attribution Parties")), would beneficially own in excess of the Beneficial Ownership Limitation (as defined below). For purposes of the foregoing sentence, the number of shares of Common Stock beneficially owned by the Holder and its Affiliates and Attribution Parties shall include the number of shares of Common Stock issuable upon exercise of this Warrant with respect to which such determination is being made, but shall exclude the number of shares of Common Stock which would be issuable upon (i) exercise of the remaining, nonexercised portion of this Warrant beneficially owned by the Holder or any of its Affiliates or Attribution Parties and (ii) exercise or conversion of the unexercised or nonconverted portion of any other securities of the Company (including, without limitation, any other Common Stock Equivalents) subject to a limitation on conversion or exercise analogous to the limitation contained herein beneficially owned by the Holder or any of its Affiliates or Attribution Parties. Except as set forth in the preceding sentence, for purposes of this Section 2(e), beneficial ownership shall be calculated in accordance with Section 13(d) of the Exchange Act and the rules and regulations promulgated thereunder, it being acknowledged by the Holder that the Company is not representing to the Holder that such calculation is in compliance with Section 13(d) of the Exchange Act and the Holder is solely responsible for any schedules required to be filed in accordance therewith. To the extent that the limitation contained in this Section 2(e) applies, the determination of whether this Warrant is exercisable (in relation to other securities owned by the Holder together with any Affiliates and Attribution Parties) and of which portion of this Warrant is exercisable shall be in the sole discretion of the Holder, and the submission of a Notice of Exercise shall be deemed to be the Holder's determination of whether this Warrant is exercisable (in relation to other securities owned by the Holder together with any Affiliates and Attribution Parties) and of which portion of this Warrant is exercisable, in each case subject to the Beneficial Ownership Limitation, and the Company shall have no obligation to verify or confirm the accuracy of such determination. In addition, a determination as to any group status as contemplated above shall be determined in accordance with Section 13(d) of the Exchange Act and the rules and regulations promulgated thereunder. For purposes of this Section 2(e), in determining the number of outstanding shares of Common Stock, a Holder may rely on the number of outstanding shares of Common Stock as reflected in (A) the Company's most recent periodic or annual report filed with the Commission, as the case may be, (B) a more recent public announcement by the Company or (C) a more recent written notice by the Company or the Transfer Agent setting forth the number of shares of Common Stock outstanding. Upon the written or oral request of a Holder, the Company shall within one Trading Day confirm orally and in writing to the Holder the number of shares of Common Stock then outstanding. In any case, the number of outstanding shares of Common Stock shall be determined after giving effect to the conversion or exercise of securities of the Company, including this Warrant, by the Holder or its Affiliates or Attribution Parties since the date as of which such number of outstanding shares of Common Stock was reported. The "Beneficial Ownership Limitation" shall be 4.99% (or, upon election by a Holder prior to the issuance of any Warrants, 9.99%) of the number of shares of the Common Stock outstanding immediately after giving effect to the issuance of shares of Common Stock issuable upon exercise of this Warrant. The Holder, upon notice to the Company, may increase or decrease the Beneficial Ownership Limitation provisions of this Section 2(e), provided that the Beneficial Ownership Limitation in no event exceeds 9.99% of the number of shares of the Common Stock outstanding immediately after giving effect to the issuance of shares of Common Stock upon exercise of this Warrant held by the Holder and the provisions of this Section 2(e) shall continue to apply. Any increase in the Beneficial Ownership Limitation will not be effective until the 61st day after such notice is delivered to the Company. The provisions of this paragraph shall be construed and implemented in a manner otherwise than in strict conformity with the terms of this Section 2(e) to correct this paragraph (or any portion hereof) which may be defective or inconsistent with the intended Beneficial Ownership Limitation herein contained or to make changes or supplements necessary or desirable to properly give effect to such limitation. The limitations contained in this paragraph shall apply to a successor holder of this Warrant.

Section 3. Certain Adjustments.

a) Stock Dividends and Splits. If the Company, at any time while this Warrant is outstanding: (i) pays a stock dividend or otherwise makes a distribution or distributions on shares of its Common Stock or any other equity or equity equivalent securities payable in shares of Common Stock (which, for avoidance of doubt, shall not include any shares of Common Stock issued by the Company upon exercise of this Warrant), (ii) subdivides outstanding shares of Common Stock into a larger number of shares, (iii) combines (including by way of reverse stock split) outstanding shares of Common Stock into a smaller number of shares, or (iv) issues by reclassification of shares of the Common Stock any shares of capital stock of the Company, then in each case the Exercise Price shall be multiplied by a fraction of which the numerator shall be the number of shares of Common Stock (excluding treasury shares, if any) outstanding immediately before such event and of which the denominator shall be the number of shares of Common Stock outstanding immediately after such event, and the number of shares issuable upon exercise of this Warrant shall be proportionately adjusted such that the aggregate Exercise Price of this Warrant shall remain unchanged. Any adjustment made pursuant to this Section 3(a) shall become effective immediately after the record date for the determination of stockholders entitled to receive such dividend or distribution and shall become effective immediately after the effective date in the case of a subdivision, combination or re-classification.

b) Reserved.

c) Subsequent Rights Offerings. In addition to any adjustments pursuant to Section 3(a) above, if at any time the Company grants, issues or sells any Common Stock Equivalents or rights to purchase stock, warrants, securities or other property pro rata to the record holders of any class of shares of Common Stock (the "Purchase Rights"), then the Holder will be entitled to acquire, upon the terms applicable to such Purchase Rights, the aggregate Purchase Rights which the Holder could have acquired if the Holder had held the number of shares of Common Stock acquirable upon complete exercise of this Warrant (without regard to any limitations on exercise hereof, including without limitation, the Beneficial Ownership Limitation) immediately before the date on which a record is taken for the grant, issuance or sale of such Purchase Rights, or, if no such record is taken, the date as of which the record holders of shares of Common Stock are to be determined for the grant, issue or sale of such Purchase Rights (provided, however, that, to the extent that the Holder's right to participate in any such Purchase Right would result in the Holder exceeding the Beneficial Ownership Limitation, then the Holder shall not be entitled to participate in such Purchase Right to such extent (or beneficial ownership of such shares of Common Stock as a result of such Purchase Right to such extent) and such Purchase Right to such extent shall be held in abeyance for the Holder until such time, if ever, as its right thereto would not result in the Holder exceeding the Beneficial Ownership Limitation).

d) Pro Rata Distributions. During such time as this Warrant is outstanding, if the Company shall declare or make any dividend or other distribution of its assets (or rights to acquire its assets) to holders of shares of Common Stock, by way of return of capital or otherwise (including, without limitation, any distribution of cash, stock or other securities, property or options by way of a dividend, spin off, reclassification, corporate rearrangement, scheme of arrangement or other similar transaction) (a "Distribution"), at any time after the issuance of this Warrant, then, in each such case, the Holder shall be entitled to participate in such Distribution to the same extent that the Holder would have participated therein if the Holder had held the number of shares of Common Stock acquirable upon complete exercise of this Warrant (without regard to any limitations on exercise hereof, including without limitation, the Beneficial Ownership Limitation) immediately before the date of which a record is taken for such Distribution, or, if no such record is taken, the date as of which the record holders of shares of Common Stock are to be determined for the participation in such Distribution (provided, however, that, to the extent that the Holder's right to participate in any such Distribution would result in the Holder exceeding the Beneficial Ownership Limitation, then the Holder shall not be entitled to participate in such Distribution to such extent (or in the beneficial ownership of any shares of Common Stock as a result of such Distribution to such extent) and the portion of such Distribution shall be held in abeyance for the benefit of the Holder until such time, if ever, as its right thereto would not result in the Holder exceeding the Beneficial Ownership Limitation).

e) Fundamental Transaction. If, at any time while this Warrant is outstanding, (i) the Company, directly or indirectly, in one or more related transactions effects any merger or consolidation of the Company with or into another Person, (ii) the Company or any Subsidiary, directly or indirectly, effects any sale, lease, license, assignment, transfer, conveyance or other disposition of all or substantially all of its assets in one or a series of related transactions, (iii) any, direct or indirect, purchase offer, tender offer or exchange offer (whether by the Company or another Person) is completed pursuant to which holders of Common Stock are permitted to sell, tender or exchange their shares for other securities, cash or property and has been accepted by the holders of 50% or more of the outstanding Common Stock or 50% or more of the voting power of the common equity of the Company, (iv) the Company, directly or indirectly, in one or more related transactions effects any reclassification, reorganization or recapitalization of the Common Stock or any compulsory share exchange pursuant to which the Common Stock is effectively converted into or exchanged for other securities, cash or property, or (v) the Company, directly or indirectly, in one or more related transactions consummates a stock or share purchase agreement or other business combination (including, without limitation, a reorganization, recapitalization, spin-off, merger or scheme of arrangement) with another Person or group of Persons whereby such other Person or group acquires 50% or more of the outstanding shares of Common Stock or 50% or more of the voting power of the common equity of the Company (each a "Fundamental Transaction"), then, upon any subsequent exercise of this Warrant, the Holder shall have the right to receive, for each Warrant Share that would have been issuable upon such exercise immediately prior to the occurrence of such Fundamental Transaction, at the option of the Holder (without regard to any limitation in Section 2(e) on the exercise of this Warrant), the number of shares of Common Stock of the successor or acquiring corporation or of the Company, if it is the surviving corporation, and any additional consideration (the "Alternate Consideration") receivable as a result of such Fundamental Transaction by a holder of the number of shares of Common Stock for which this Warrant is exercisable immediately prior to such Fundamental Transaction (without regard to any limitation in Section 2(e) on the exercise of this Warrant). For purposes of any such exercise, the determination of the Exercise Price shall be appropriately adjusted to apply to such Alternate Consideration based on the amount of Alternate Consideration issuable in respect of one share of Common Stock in such Fundamental Transaction, and the Company shall apportion the Exercise Price among the Alternate Consideration in a reasonable manner reflecting the relative value of any different components of the Alternate Consideration. If holders of Common Stock are given any 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 Alternate Consideration it receives upon any exercise of this Warrant following such Fundamental Transaction. Notwithstanding anything to the contrary, in the event of a Fundamental Transaction, the Company or any Successor Entity (as defined below) shall, at the Holder's option, exercisable at any time concurrently with, or within 30 days after, the consummation of the Fundamental Transaction (or, if later, the date of the public announcement of the applicable Fundamental Transaction), purchase this Warrant from the Holder by paying to the Holder an amount of cash equal to the Black Scholes Value (as defined below) of the remaining unexercised portion of this Warrant on the date of the consummation of such Fundamental Transaction; provided, however, that, if the Fundamental Transaction is not within the Company's control, including not approved by the Company's Board of Directors, Holder shall only be entitled to receive from the Company or any Successor Entity the same type or form of consideration (and in the same proportion), at the Black Scholes Value of the unexercised portion of this Warrant, that is being offered and paid to the holders of Common Stock of the Company in connection with the Fundamental Transaction, whether that consideration be in the form of cash, stock or any combination thereof, or whether the holders of Common Stock are given the choice to receive from among alternative forms of consideration in connection with the Fundamental Transaction; provided, further, that if holders of Common Stock of the Company are not offered or paid any consideration in such Fundamental Transaction, such holders of Common Stock will be deemed to have received common stock of the Successor Entity (which Entity may be the Company following such Fundamental Transaction) in such Fundamental Transaction. "Black Scholes Value" means the value of this Warrant based on the Black-Scholes Option Pricing Model obtained from the "OV" function on Bloomberg, L.P. ("Bloomberg") determined as of the day of consummation of the applicable contemplated Fundamental Transaction for pricing purposes and reflecting (A) a risk-free interest rate corresponding to the U.S. Treasury rate for a period equal to the time between the date of the public announcement of the applicable Fundamental Transaction and the Termination Date, (B) an expected volatility equal to the greater of 100% and the 100 day volatility obtained from the HVT function on Bloomberg (determined utilizing a 365 day annualization factor) as of the Trading Day immediately following the public announcement of the applicable contemplated Fundamental Transaction, (C) the underlying price per share used in such calculation shall be the greater of (i) the sum of the price per share being offered in cash, if any, plus the value of any non-cash consideration, if any, being offered in such Fundamental Transaction and (ii) the highest VWAP during the period beginning on the Trading Day immediately preceding the public announcement of the applicable contemplated Fundamental Transaction (or the consummation of the applicable Fundamental Transaction, if earlier) and ending on the Trading Day of the Holder's request pursuant to this Section 3(e) and (D) a remaining option time equal to the time between the date of the public announcement of the applicable contemplated Fundamental Transaction and the Termination Date [and (E) a zero cost of borrow. The payment of the Black Scholes Value will be made by wire transfer of immediately available funds (or such other consideration) within five Business Days of the Holder's election (or, if later, on the date of consummation of the Fundamental Transaction). The Company shall cause any successor entity in a Fundamental Transaction in which the Company is not the survivor (the "Successor Entity") to assume in writing all of the obligations of the Company under this Warrant in accordance with the provisions of this Section 3(e) pursuant to written agreements in form and substance reasonably satisfactory to the Holder and approved by the Holder (without unreasonable delay) prior to such Fundamental Transaction and shall, at the option of the Holder, deliver to the Holder in exchange for this Warrant a security of the Successor Entity evidenced by a written instrument substantially similar in form and substance to this Warrant which is exercisable for a corresponding number of shares of capital stock of such Successor Entity (or its parent entity) equivalent to the shares of Common Stock acquirable and receivable upon exercise of this Warrant (without regard to any limitations on the exercise of this Warrant) prior to such Fundamental Transaction, and with an exercise price which applies the exercise price hereunder to such shares of capital stock (but taking into account the relative value of the shares of Common Stock pursuant to such Fundamental Transaction and the value of such shares of capital stock, such number of shares of capital stock and such exercise price being for the purpose of protecting the economic value of this Warrant immediately prior to the consummation of such Fundamental Transaction), and which is reasonably satisfactory in form and substance to the Holder. Upon the occurrence of any such Fundamental Transaction, the Successor Entity shall be added to the term "Company" under this Warrant (so that from and after the occurrence or consummation of such Fundamental Transaction, each and every provision of this Warrant and the other Transaction Documents referring to the "Company" shall refer instead to each of the Company and the Successor Entity or Successor Entities, jointly and severally), and the Successor Entity or Successor Entities, jointly and severally with the Company, may exercise every right and power of the Company prior thereto and the Successor Entity or Successor Entities shall assume all of the obligations of the Company prior thereto under this Warrant and the other Transaction Documents with the same effect as if the Company and such

Successor Entity or Successor Entities, jointly and severally, had been named as the Company herein. For the avoidance of doubt, the Holder shall be entitled to the benefits of the provisions of this Section 3(e) regardless of (i) whether the Company has sufficient authorized shares of Common Stock for the issuance of Warrant Shares and/or (ii) whether a Fundamental Transaction occurs prior to the Initial Exercise Date.

f) Calculations. All calculations under this Section 3 shall be made to the nearest cent or the nearest 1/100th of a share, as the case may be. For purposes of this Section 3, the number of shares of Common Stock deemed to be issued and outstanding as of a given date shall be the sum of the number of shares of Common Stock (excluding treasury shares, if any) issued and outstanding.

g) Notice to Holder.

i. Adjustment to Exercise Price. Whenever the Exercise Price is adjusted pursuant to any provision of this Section 3, the Company shall promptly deliver to the Holder by email a notice setting forth the Exercise Price after such adjustment and any resulting adjustment to the number of Warrant Shares and setting forth a brief statement of the facts requiring such adjustment.

ii. Notice to Allow Exercise by Holder. If (A) the Company shall declare a dividend (or any other distribution in whatever form) on the Common Stock, (B) the Company shall declare a special nonrecurring cash dividend on or a redemption of the Common Stock, (C) the Company shall authorize the granting to all holders of the Common Stock rights or warrants to subscribe for or purchase any shares of capital stock of any class or of any rights, (D) the approval of any stockholders of the Company shall be required in connection with any reclassification of the Common Stock, any consolidation or merger to which the Company (or any of its Subsidiaries) is a party, any sale or transfer of all or substantially all of its assets, or any compulsory share exchange whereby the Common Stock is converted into other securities, cash or property, or (E) the Company shall authorize the voluntary or involuntary dissolution, liquidation or winding up of the affairs of the Company, then, in each case, the Company shall cause to be delivered by email to the Holder at its last email address as it shall appear upon the Warrant Register of the Company, at least 20 calendar days prior to the applicable record or effective date hereinafter specified, a notice stating (x) the date on which a record is to be taken for the purpose of such dividend, distribution, redemption, rights or warrants, or if a record is not to be taken, the date as of which the holders of the Common Stock of record to be entitled to such dividend, distributions, redemption, rights or warrants are to be determined or (y) the date on which such reclassification, consolidation, merger, sale, transfer or share exchange is expected to become effective or close, and the date as of which it is expected that holders of the Common Stock of record shall be entitled to exchange their shares of the Common Stock for securities, cash or other property deliverable upon such reclassification, consolidation, merger, sale, transfer or share exchange; provided that the failure to deliver such notice or any defect therein or in the delivery thereof shall not affect the validity of the corporate action required to be specified in such notice. To the extent that any notice provided in this Warrant constitutes, or contains, material, non-public information regarding the Company or any of the Subsidiaries, the Company shall simultaneously file such notice with the Commission pursuant to a Current Report on Form 8-K. The Holder shall remain entitled to exercise this Warrant during the period commencing on the date of such notice to the effective date of the event triggering such notice except as may otherwise be expressly set forth herein.

h) Voluntary Adjustment By Company. Subject to the rules and regulations of the Trading Market, the Company may at any time during the term of this Warrant, subject to the prior written consent of the Holder, reduce the then current Exercise Price to any amount and for any period of time deemed appropriate by the board of directors of the Company.

Section 4. Transfer of Warrant.

a) Transferability. This Warrant and all rights hereunder (including, without limitation, any registration rights) are transferable, in whole or in part, upon surrender of this Warrant at the principal office of the Company or its designated agent, together with a written assignment of this Warrant substantially in the form attached hereto duly executed by the Holder or its agent or attorney and funds sufficient to pay any transfer taxes payable upon the making of such transfer. Upon such surrender and, if required, such payment, the Company shall execute and deliver a new Warrant or Warrants in the name of the assignee or assignees, as applicable, and in the denomination or denominations specified in such instrument of assignment, and shall issue to the assignor a new Warrant evidencing the portion of this Warrant not so assigned, and this Warrant shall promptly be cancelled. Notwithstanding anything herein to the contrary, the Holder shall not be required to physically surrender this Warrant to the Company unless the Holder has assigned this Warrant in full, in which case, the Holder shall surrender this Warrant to the Company within three (3) Trading Days of the date on which the Holder delivers an assignment form to the Company assigning this Warrant in full. The Warrant, if properly assigned in accordance herewith, may be exercised by a new holder for the purchase of Warrant Shares without having a new Warrant issued.

b) New Warrants. If this Warrant is not held in global form through DTC (or any successor depository), this Warrant may be divided or combined with other Warrants upon presentation hereof at the aforesaid office of the Company, together with a written notice specifying the names and denominations in which new Warrants are to be issued, signed by the Holder or its agent or attorney. Subject to compliance with Section 4(a), as to any transfer which may be involved in such division or combination, the Company shall execute and deliver a new Warrant or Warrants in exchange for the Warrant or Warrants to be divided or combined in accordance with such notice. All Warrants issued on transfers or exchanges shall be dated the initial issuance date of this Warrant and shall be identical with this Warrant except as to the number of Warrant Shares issuable pursuant thereto.

c) Warrant Register. The Warrant Agent shall register this Warrant, upon records to be maintained by the Warrant Agent for that purpose (the “Warrant Register”), in the name of the record Holder hereof from time to time. The Company and the Warrant Agent may deem and treat the registered Holder of this Warrant as the absolute owner hereof for the purpose of any exercise hereof or any distribution to the Holder, and for all other purposes, absent actual notice to the contrary.

Section 5. Miscellaneous.

a) No Rights as Stockholder Until Exercise; No Settlement in Cash. This Warrant does not entitle the Holder to any voting rights, dividends or other rights as a stockholder of the Company prior to the exercise hereof as set forth in Section 2(d) (i), except as expressly set forth in Section 3. Without limiting any rights of a Holder to receive Warrant Shares on a “cashless exercise” pursuant to Section 2(c) or to receive cash payments pursuant to Section 2(d)(i) and Section 2(d)(iv) herein, in no event shall the Company be required to net cash settle an exercise of this Warrant.

b) Loss, Theft, Destruction or Mutilation of Warrant. The Company covenants that upon receipt by the Company of evidence reasonably satisfactory to it of the loss, theft, destruction or mutilation of this Warrant or any stock certificate relating to the Warrant Shares, and in case of loss, theft or destruction, of indemnity or security reasonably satisfactory to it (which, in the case of the Warrant, shall not include the posting of any bond), and upon surrender and cancellation of such Warrant or stock certificate, if mutilated, the Company will make and deliver a new Warrant or stock certificate of like tenor and dated as of such cancellation, in lieu of such Warrant or stock certificate.

c) Saturdays, Sundays, Holidays, etc. If the last or appointed day for the taking of any action or the expiration of any right required or granted herein shall not be a Business Day, then such action may be taken or such right may be exercised on the next succeeding Business Day.

d) Authorized Shares.

The Company covenants that, during the period the Warrant is outstanding, it will reserve from its authorized and unissued Common Stock a sufficient number of shares to provide for the issuance of the Warrant Shares upon the exercise of any purchase rights under this Warrant. The Company further covenants that its issuance of this Warrant shall constitute full authority to its officers who are charged with the duty of issuing the necessary Warrant Shares upon the exercise of the purchase rights under this Warrant. The Company will take all such reasonable action as may be necessary to assure that such Warrant Shares may be issued as provided herein without violation of any applicable law or regulation, or of any requirements of the Trading Market upon which the Common Stock may be listed. The Company covenants that all Warrant Shares which may be issued upon the exercise of the purchase rights represented by this Warrant will, upon exercise of the purchase rights represented by this Warrant and payment for such Warrant Shares in accordance herewith, be duly authorized, validly issued, fully paid and nonassessable and free from all taxes, liens and charges created by the Company in respect of the issue thereof (other than taxes in respect of any transfer occurring contemporaneously with such issue).

Except and to the extent as waived or consented to by the Holder, the Company shall not by any action, including, without limitation, amending its certificate of incorporation or through any reorganization, transfer of assets, consolidation, merger, dissolution, issue or sale of securities or any other voluntary action, avoid or seek to avoid the observance or performance of any of the terms of this Warrant, but will at all times in good faith assist in the carrying out of all such terms and in the taking of all such actions as may be necessary or appropriate to protect the rights of Holder as set forth in this Warrant against impairment. Without limiting the generality of the foregoing, the Company will (i) not increase the par value of any Warrant Shares above the amount payable therefor upon such exercise immediately prior to such increase in par value, (ii) take all such action as may be necessary or appropriate in order that the Company may validly and legally issue fully paid and nonassessable Warrant Shares upon the exercise of this Warrant and (iii) use commercially reasonable efforts to obtain all such authorizations, exemptions or consents from any public regulatory body having jurisdiction thereof, as may be, necessary to enable the Company to perform its obligations under this Warrant.

Before taking any action which would result in an adjustment in the number of Warrant Shares for which this Warrant is exercisable or in the Exercise Price, the Company shall obtain all such authorizations or exemptions thereof, or consents thereto, as may be necessary from any public regulatory body or bodies having jurisdiction thereof.

e) Governing Law. All questions concerning the construction, validity, enforcement and interpretation of this Warrant shall be governed by and construed and enforced in accordance with the internal laws of the State of New York, without regard to the principles of conflicts of law thereof. Each party agrees that all legal proceedings concerning the interpretations, enforcement and defense of the transactions contemplated by this Warrant (whether brought against a party hereto or their respective affiliates, directors, officers, shareholders, partners, members, employees or agents) shall be commenced exclusively in the state and federal courts sitting in the City of New York. Each party hereby irrevocably submits to the exclusive jurisdiction of the state and federal courts sitting in the City of New York, Borough of Manhattan for the adjudication of any dispute hereunder or in connection herewith or with any transaction contemplated hereby or discussed herein, and hereby irrevocably waives, and agrees not to assert in any suit, action or proceeding, any claim that it is not personally subject to the jurisdiction of any such court, that such suit, action or proceeding is improper or is an inconvenient venue for such proceeding. Each party hereby irrevocably waives personal service of process and consents to process being served in any such suit, action or proceeding by mailing a copy thereof via registered or certified mail or overnight delivery (with evidence of delivery) to such party at the address in effect for notices to it under this Warrant and agrees that such service shall constitute good and sufficient service of process and notice thereof. Nothing contained herein shall be deemed to limit in any way any right to serve process in any other manner permitted by law. If either party shall commence an action, suit or proceeding to enforce any provisions of this Warrant, the prevailing party in such action, suit or proceeding shall be reimbursed by the other party for their reasonable attorneys' fees and other costs and expenses incurred with the investigation, preparation and prosecution of such action or proceeding. **Notwithstanding the foregoing, this exclusive forum provision shall not apply to suits brought to enforce a duty or liability created by the Exchange Act, any other claim for which the federal courts have exclusive jurisdiction or any complaint asserting a cause of action arising under the Securities Act against us or any of our directors, officers, other employees or agents. Section 27 of the Exchange Act creates exclusive federal jurisdiction over all suits brought to enforce any duty or liability created by the Exchange Act or the rules and regulations thereunder.**

f) Restrictions. The Holder acknowledges that the Warrant Shares acquired upon the exercise of this Warrant, if not registered, and the Holder does not utilize cashless exercise, will have restrictions upon resale imposed by state and federal securities laws.

g) Nonwaiver and Expenses. No course of dealing or any delay or failure to exercise any right hereunder on the part of Holder shall operate as a waiver of such right or otherwise prejudice the Holder's rights, powers or remedies. Without limiting any other provision of this Warrant, if the Company willfully and knowingly fails to comply with any provision of this Warrant, which results in any material damages to the Holder, the Company shall pay to the Holder such amounts as shall be sufficient to cover any costs and expenses including, but not limited to, reasonable attorneys' fees, including those of appellate proceedings, incurred by the Holder in collecting any amounts due pursuant hereto or in otherwise enforcing any of its rights, powers or remedies hereunder.

h) Notices. Any and all notices or other communications or deliveries to be provided by the Holders hereunder including, without limitation, any Notice of Exercise, shall be in writing and delivered personally, by e-mail, or sent by a nationally recognized overnight courier service, addressed to the Company, at 2 Burlington Woods Drive, Suite 100, Burlington, MA 01803 Attention: Mr. Jeffrey Frelick, Chief Executive Officer, email address: ###, or such other email address or address as the Company may specify for such purposes by notice to the Holders. Any and all notices or other communications or deliveries to be provided by the Company hereunder shall be in writing and delivered personally, by e-mail, or sent by a nationally recognized overnight courier service addressed to each Holder at the e-mail address or address of such Holder appearing on the books of the Company. Any notice or other communication or deliveries hereunder shall be deemed given and effective on the earliest of (i) the time of transmission, if such notice or communication is delivered via e-mail at the e-mail address set forth in this Section prior to 5:30 p.m. (New York City time) on any date, (ii) the next Trading Day after the time of transmission, if such notice or communication is delivered via e-mail at the e-mail address set forth in this Section on a day that is not a Trading Day or later than 5:30 p.m. (New York City time) on any Trading Day, (iii) the second Trading Day following the date of mailing, if sent by U.S. nationally recognized overnight courier service, or (iv) upon actual receipt by the party to whom such notice is required to be given. To the extent that any notice provided hereunder constitutes, or contains, material, non-public information regarding the Company or any Subsidiaries, the Company shall simultaneously file such notice with the Commission pursuant to a Current Report on Form 8-K.

i) Limitation of Liability. No provision hereof, in the absence of any affirmative action by the Holder to exercise this Warrant to purchase Warrant Shares, and no enumeration herein of the rights or privileges of the Holder, shall give rise to any liability of the Holder for the purchase price of any Common Stock or as a stockholder of the Company, whether such liability is asserted by the Company or by creditors of the Company.

j) Remedies. The Holder, in addition to being entitled to exercise all rights granted by law, including recovery of damages, will be entitled to specific performance of its rights under this Warrant. The Company agrees that monetary damages would not be adequate compensation for any loss incurred by reason of a breach by it of the provisions of this Warrant and hereby agrees to waive and not to assert the defense in any action for specific performance that a remedy at law would be adequate.

k) Successors and Assigns. Subject to applicable securities laws, this Warrant and the rights and obligations evidenced hereby shall inure to the benefit of and be binding upon the successors and permitted assigns of the Company and the successors and permitted assigns of Holder. The provisions of this Warrant are intended to be for the benefit of any Holder from time to time of this Warrant and shall be enforceable by the Holder or holder of Warrant Shares.

l) Amendment. This Warrant may be modified or amended or the provisions hereof waived with the written consent of the Company, on the one hand, and the Holder of the beneficial owner of this Warrant, on the other hand.

m) Severability. Wherever possible, each provision of this Warrant shall be interpreted in such manner as to be effective and valid under applicable law, but if any provision of this Warrant shall be prohibited by or invalid under applicable law, such provision shall be ineffective to the extent of such prohibition or invalidity, without invalidating the remainder of such provisions or the remaining provisions of this Warrant.

n) Headings. The headings used in this Warrant are for the convenience of reference only and shall not, for any purpose, be deemed a part of this Warrant.

o) Warrant Agency Agreement. If this Warrant is held in global form through DTC (or any successor depositary), this Warrant is issued subject to the Warrant Agency Agreement. To the extent any provision of this Warrant conflicts with the express provisions of the Warrant Agency Agreement, the provisions of this Warrant shall govern and be controlling.

(Signature Page Follows)

IN WITNESS WHEREOF, the Company has caused this Warrant to be executed by its officer thereunto duly authorized as of the date first above indicated.

BONE BIOLOGICS CORPORATION

By: _____
Name: Jeffrey Frelick
Title: Chief Executive Officer

NOTICE OF EXERCISE

TO: BONE BIOLOGICS CORPORATION

- (1) The undersigned hereby elects to purchase _____ Warrant Shares of the Company pursuant to the terms of the attached Warrant (only if exercised in full), and tenders herewith payment of the exercise price in full, together with all applicable transfer taxes, if any.
- (2) Payment shall take the form of (check applicable box):

☐ in lawful money of the United States; or

☐ if permitted the cancellation of such number of Warrant Shares as is necessary, in accordance with the formula set forth in subsection 2(c), to exercise this Warrant with respect to the maximum number of Warrant Shares purchasable pursuant to the cashless exercise procedure set forth in subsection 2(c).
- (3) Please register and issue said Warrant Shares in the name of the undersigned or in such other name as is specified below:

The Warrant Shares shall be delivered to the following DWAC Account Number or by physical delivery of a certificate to:

- (4) Accredited Investor. If the Warrant is being exercised via cash exercise, the undersigned is an “accredited investor” as defined in Regulation D promulgated under the Securities Act of 1933, as amended.

[SIGNATURE OF HOLDER]

Name of Investing Entity:

Signature of Authorized Signatory of Investing Entity:

Name of Authorized Signatory:

Title of Authorized Signatory:

Date:

ASSIGNMENT FORM

(To assign the foregoing Warrant, execute this form and supply required information. Do not use this form to exercise the Warrant.)

FOR VALUE RECEIVED, [] all of or [] shares of the foregoing Warrant and all rights evidenced thereby are hereby assigned to

Name: (Please Print)

Address: (Please Print)

Phone Number:

Email Address:

Dated: _____, _____

Holder’s Signature:

Holder’s Address:

NOTE: The signature to this Assignment Form must correspond with the name as it appears on the face of the Warrant, without alteration or enlargement or any change whatsoever. Officers of corporations and those acting in a fiduciary or other representative capacity should file proper evidence of authority to assign the foregoing Warrant.

[FORM OF SERIES B COMMON STOCK PURCHASE WARRANT]**BONE BIOLOGICS CORPORATION
SERIES B COMMON STOCK PURCHASE WARRANT**

Warrant Shares: _____

Initial Exercise Date: October 12, 2022

THIS SERIES B COMMON STOCK PURCHASE WARRANT (the “Warrant”) certifies that, for value received, [_____] or its assigns (the “Holder”) is entitled, upon the terms and subject to the limitations on exercise and the condition set forth hereinafter set forth, at any time on or after the date hereof (the “Initial Exercise Date”) and on or prior to 5:00 p.m. (New York City time) on October 12, 2027 (the “Termination Date”) but not thereafter, to subscribe for and purchase from Bone Biologics Corporation, a Delaware corporation (the “Company”), up to [_____] shares (as subject to adjustment hereunder, the “Warrant Shares”) of Common Stock. The purchase price of one share of Common Stock under this Warrant shall be equal to the Exercise Price, as defined in Section 2(b). This Warrant shall initially be issued and maintained in the form of a security held in book-entry form and the Depository Trust Company or its nominee (“DTC”) shall initially be the sole registered holder of this Warrant, subject to a Holder’s right to elect to receive a Warrant in certificated form pursuant to the terms of the Warrant Agency Agreement, in which case this sentence shall not apply.

Section 1. Definitions. In addition to the terms defined elsewhere in this Warrant, the following terms have the meanings indicated in this Section 1:

“Affiliate” means any Person that, directly or indirectly through one or more intermediaries, controls or is controlled by or is under common control with a Person, as such terms are used in and construed under Rule 405 under the Securities Act.

“Bid Price” means, for any date, the price determined by the first of the following clauses that applies: (a) if the Common Stock is then listed or quoted on a Trading Market, the bid price of the Common Stock for the time in question (or the nearest preceding date) on the Trading Market on which the Common Stock is then listed or quoted as reported by Bloomberg L.P. (based on a Trading Day from 9:30 a.m. (New York City time) to 4:02 p.m. (New York City time)), (b) if OTCQB or OTCQX is not a Trading Market, the volume weighted average price of the Common Stock for such date (or the nearest preceding date) on OTCQB or OTCQX as applicable, (c) if the Common Stock is not then listed or quoted for trading on OTCQB or OTCQX and if prices for the Common Stock are then reported on the Pink Open Market (or a similar organization or agency succeeding to its functions of reporting prices), the most recent bid price per share of the Common Stock so reported, or (d) in all other cases, the fair market value of a share of Common Stock as determined by an independent appraiser selected in good faith by the Holders of a majority in interest of the Warrants then outstanding and reasonably acceptable to the Company, the fees and expenses of which shall be paid by the Company.

“Business Day” means any day other than Saturday, Sunday or other day on which commercial banks in The City of New York are authorized or required by law to remain closed; provided, however, for clarification, commercial banks shall not be deemed to be authorized or required by law to remain closed due to “stay at home”, “shelter-in-place”, “non-essential employee” or any other similar orders or restrictions or the closure of any physical branch locations at the direction of any governmental authority so long as the electronic funds transfer systems (including for wire transfers) of commercial banks in The City of New York generally are open for use by customers on such day.

“Commission” means the United States Securities and Exchange Commission.

“Common Stock” means the common stock of the Company, par value \$0.001 per share, and any other class of securities into which such securities may hereafter be reclassified or changed.

“Exchange Act” means the Securities Exchange Act of 1934, as amended, and the rules and regulations promulgated thereunder.

“Person” means an individual or corporation, partnership, trust, incorporated or unincorporated association, joint venture, limited liability company, joint stock company, government (or an agency or subdivision thereof) or other entity of any kind.

“Registration Statement” means the Company’s registration statement on Form S-1 (File No. 333-267588).

“Securities Act” means the Securities Act of 1933, as amended, and the rules and regulations promulgated thereunder.

“Subsidiary” means any subsidiary of the Company and shall, where applicable, also include any direct or indirect subsidiary of the Company formed or acquired after the date hereof.

“Trading Day” means a day on which the Common Stock is traded on a Trading Market.

“Trading Market” means any of the following markets or exchanges on which the Common Stock is listed or quoted for trading on the date in question: the NYSE American, the Nasdaq Capital Market, the Nasdaq Global Market, the Nasdaq Global Select Market, the New York Stock Exchange, OTCQB or OTCQX (or any successors to any of the foregoing).

“Transfer Agent” means Equiniti Trust Company, the current transfer agent of the Company, with a mailing address of 1110 Centre Pointe Curve, Mendota Heights, MN 55120, and any successor transfer agent of the Company.

“Underwriting Agreement” means the underwriting agreement, dated as of October 7, 2022, among the Company and WallachBeth Capital, LLC as representative of the underwriters named therein, as amended, modified or supplemented from time to time in accordance with its terms.

“VWAP” means, for any date, the price determined by the first of the following clauses that applies: (a) if the Common Stock is then listed or quoted on a Trading Market, the daily volume weighted average price of the Common Stock for such date (or the nearest preceding date) on the Trading Market on which the Common Stock is then listed or quoted as reported by Bloomberg L.P. (based on a Trading Day from 9:30 a.m. (New York City time) to 4:02 p.m. (New York City time)), (b) if OTCQB or OTCQX is not a Trading Market, the volume weighted average price of the Common Stock for such date (or the nearest preceding date) on OTCQB or OTCQX as applicable, (c) if the Common Stock is not then listed or quoted for trading on OTCQB or OTCQX and if prices for the Common Stock are then reported on the Pink Open Market (or a similar organization or agency succeeding to its functions of reporting prices), the most recent bid price per share of the Common Stock so reported, or (d) in all other cases, the fair market value of a share of Common Stock as determined by an independent appraiser selected in good faith by the holders of a majority in interest of the Common Stock Purchase Warrants then outstanding and reasonably acceptable to the Company, the fees and expenses of which shall be paid by the Company.

“Warrant Agency Agreement” means that certain warrant agent agreement, dated on or about the Initial Exercise Date, between the Company and the Warrant Agent.

“Warrant Agent” means the Transfer Agent and any successor warrant agent of the Company.

“Warrants” means this Warrant and other Common Stock purchase warrants issued by the Company pursuant to the Registration Statement.

Section 2. Exercise.

a) Exercise of Warrant. Exercise of the purchase rights represented by this Warrant may be made, in whole or in part, at any time or times on or after the Initial Exercise Date and on or before the Termination Date by delivery to the Company of a duly executed PDF copy submitted by e-mail (or e-mail attachment) of the Notice of Exercise in the form annexed hereto (the “Notice of Exercise”). Within the earlier of (i) two (2) Trading Days and (ii) the number of Trading Days comprising the Standard Settlement Period (as defined in Section 2(d)(i) herein) following the date of exercise as aforesaid, the Holder shall deliver the aggregate Exercise Price for the shares specified in the applicable Notice of Exercise by wire transfer or cashier’s check drawn on a United States bank unless the cashless exercise procedure specified in Section 2(c) below is specified in the applicable Notice of Exercise. No ink-original Notice of Exercise shall be required, nor shall any medallion guarantee (or other type of guarantee or notarization) of any Notice of Exercise be required. Notwithstanding anything herein to the contrary, the Holder shall not be required to physically surrender this Warrant to the Company until the Holder has purchased all of the Warrant Shares available hereunder and the Warrant has been exercised in full, in which case, the Holder shall surrender this Warrant to the Company for cancellation within three (3) Trading Days of the date on which the final Notice of Exercise is delivered to the Company. Partial exercises of this Warrant resulting in purchases of a portion of the total number of Warrant Shares available hereunder shall have the effect of lowering the outstanding number of Warrant Shares purchasable hereunder in an amount equal to the applicable number of Warrant Shares purchased. The Holder and the Company shall maintain records showing the number of Warrant Shares purchased and the date of such purchases. The Company shall deliver any objection to any Notice of Exercise within one (1) Business Day of receipt of such notice. **The Holder and any assignee, by acceptance of this Warrant, acknowledge and agree that, by reason of the provisions of this paragraph, following the purchase of a portion of the Warrant Shares hereunder, the number of Warrant Shares available for purchase hereunder at any given time may be less than the amount stated on the face hereof.**

Notwithstanding the foregoing in this Section 2(a), a holder whose interest in this Warrant is a beneficial interest in certificate(s) representing this Warrant held in book-entry form through DTC (or another established clearing corporation performing similar functions), shall effect exercises made pursuant to this Section 2(a) by delivering to DTC (or such other clearing corporation, as applicable) the appropriate instruction form for exercise, complying with the procedures to effect exercise that are required by DTC (or such other clearing corporation, as applicable), subject to a Holder's right to elect to receive a Warrant in certificated form pursuant to the terms of the Warrant Agency Agreement, in which case this sentence shall not apply.

b) Exercise Price. The exercise price per share of Common Stock under this Warrant shall be \$1.35, subject to adjustment hereunder (the "Exercise Price").

c) Cashless Exercise. If at the time of exercise hereof there is no effective registration statement registering, or the prospectus contained therein is not available for the issuance of the Warrant Shares to the Holder, then this Warrant may also be exercised, in whole or in part, at such time by means of a "cashless exercise" in which the Holder shall be entitled to receive a number of Warrant Shares equal to the quotient obtained by dividing $[(A-B) (X)]$ by (A), where:

(A) = as applicable: (i) the VWAP on the Trading Day immediately preceding the date of the applicable Notice of Exercise if such Notice of Exercise is (1) both executed and delivered pursuant to Section 2(a) hereof on a day that is not a Trading Day or (2) both executed and delivered pursuant to Section 2(a) hereof on a Trading Day prior to the opening of "regular trading hours" (as defined in Rule 600(b) of Regulation NMS promulgated under the federal securities laws) on such Trading Day, (ii) at the option of the Holder, either (y) the VWAP on the Trading Day immediately preceding the date of the applicable Notice of Exercise or (z) the Bid Price of the Common Stock on the principal Trading Market as reported by Bloomberg L.P. as of the time of the Holder's execution of the applicable Notice of Exercise if such Notice of Exercise is executed during "regular trading hours" on a Trading Day and is delivered within two (2) hours thereafter (including until two (2) hours after the close of "regular trading hours" on a Trading Day) pursuant to Section 2(a) hereof or (iii) the VWAP on the date of the applicable Notice of Exercise if the date of such Notice of Exercise is a Trading Day and such Notice of Exercise is both executed and delivered pursuant to Section 2(a) hereof after the close of "regular trading hours" on such Trading Day;

(B) = the Exercise Price of this Warrant, as adjusted hereunder; and

(X) = the number of Warrant Shares that would be issuable upon exercise of this Warrant in accordance with the terms of this Warrant if such exercise were by means of a cash exercise rather than a cashless exercise.

If Warrant Shares are issued in such a cashless exercise, the parties acknowledge and agree that in accordance with Section 3(a)(9) of the Securities Act, the Warrant Shares shall take on the registered characteristics of the Warrants being exercised. The Company agrees not to take any position contrary to this Section 2(c).

d) Mechanics of Exercise.

i. Delivery of Warrant Shares Upon Exercise. The Company shall cause the Warrant Shares purchased hereunder to be transmitted by the Transfer Agent to the Holder by crediting the account of the Holder's or its designee's balance account with The Depository Trust Company through its Deposit or Withdrawal at Custodian system ("DWAC") if the Company is then a participant in such system and either (A) there is an effective registration statement permitting the issuance of the Warrant Shares to or resale of the Warrant Shares by Holder or (B) this Warrant is being exercised via cashless exercise, and otherwise by physical delivery of a certificate, registered in the Company's share register in the name of the Holder or its designee, for the number of Warrant Shares to which the Holder is entitled pursuant to such exercise to the address specified by the Holder in the Notice of Exercise by the date that is the earliest of (i) two (2) Trading Days after the delivery to the Company of the Notice of Exercise, (ii) one (1) Trading Day after delivery of the aggregate Exercise Price to the Company and (iii) the number of Trading Days comprising the Standard Settlement Period after the delivery to the Company of the Notice of Exercise (such date, the "Warrant Share Delivery Date"). Upon delivery of the Notice of Exercise, the Holder shall be deemed for all corporate purposes to have become the holder of record of the Warrant Shares with respect to which this Warrant has been exercised, irrespective of the date of delivery of the Warrant Shares, provided that payment of the aggregate Exercise Price (other than in the case of a cashless exercise) is received within the earlier of (i) two (2) Trading Days and (ii) the number of Trading Days comprising the Standard Settlement Period following delivery of the Notice of Exercise. If the Company fails for any reason to deliver to the Holder the Warrant Shares subject to a Notice of Exercise by the Warrant Share Delivery Date, the Company shall pay to the Holder, in cash, as liquidated damages and not as a penalty, for each \$1,000 of Warrant Shares subject to such exercise (based on the VWAP of the Common Stock on the date of the applicable Notice of Exercise), \$10 per Trading Day (increasing to \$20 per Trading Day on the fifth Trading Day after such liquidated damages begin to accrue) for each Trading Day after such Warrant Share Delivery Date until such Warrant Shares are delivered or Holder rescinds such exercise. The Company agrees to maintain a transfer agent that is a participant in the FAST program so long as this Warrant remains outstanding and exercisable. As used herein, "Standard Settlement Period" means the standard settlement period, expressed in a number of Trading Days, on the Company's primary Trading Market with respect to the Common Stock as in effect on the date of delivery of the Notice of Exercise. Notwithstanding the foregoing, with respect to any Notice(s) of Exercise delivered on or prior to 12:00 p.m. (New York City time) on the Initial Exercise Date, which may be delivered at any time after the time of execution of the Underwriting Agreement, the Company agrees to deliver the Warrant Shares subject to such notice(s) by 4:00 p.m. (New York City time) on the Initial Exercise Date and the Initial Exercise Date shall be the Warrant Share Delivery Date for purposes hereunder, provided that payment of the aggregate Exercise Price (other than in the case of a cashless exercise) is received by such Warrant Share Delivery Date.

ii. Delivery of New Warrants Upon Exercise. If this Warrant shall have been exercised in part, the Company shall, at the request of a Holder and upon surrender of this Warrant certificate, at the time of delivery of the Warrant Shares, deliver to the Holder a new Warrant evidencing the rights of the Holder to purchase the unpurchased Warrant Shares called for by this Warrant, which new Warrant shall in all other respects be identical with this Warrant.

iii. Rescission Rights. If the Company fails to cause the Transfer Agent to transmit to the Holder the Warrant Shares pursuant to Section 2(d)(i) by the Warrant Share Delivery Date, then the Holder will have the right to rescind such exercise.

iv. Compensation for Buy-In on Failure to Timely Deliver Warrant Shares Upon Exercise. In addition to any other rights available to the Holder, if the Company fails to cause the Transfer Agent to transmit to the Holder the Warrant Shares in accordance with the provisions of Section 2(d)(i) above pursuant to an exercise on or before the Warrant Share Delivery Date, and if after such date the Holder is required by its broker to purchase (in an open market transaction or otherwise) or the Holder's brokerage firm otherwise purchases, shares of Common Stock to deliver in satisfaction of a sale by the Holder of the Warrant Shares which the Holder anticipated receiving upon such exercise (a "Buy-In"), then the Company shall (A) pay in cash to the Holder the amount, if any, by which (x) the Holder's total purchase price (including brokerage commissions, if any) for the shares of Common Stock so purchased exceeds (y) the amount obtained by multiplying (1) the number of Warrant Shares that the Company was required to deliver to the Holder in connection with the exercise at issue times (2) the price at which the sell order giving rise to such purchase obligation was executed, and (B) at the option of the Holder, either reinstate the portion of the Warrant and equivalent number of Warrant Shares for which such exercise was not honored (in which case such exercise shall be deemed rescinded) or deliver to the Holder the number of shares of Common Stock that would have been issued had the Company timely complied with its exercise and delivery obligations hereunder. For example, if the Holder purchases Common Stock having a total purchase price of \$11,000 to cover a Buy-In with respect to an attempted exercise of shares of Common Stock with an aggregate sale price giving rise to such purchase obligation of \$10,000, under clause (A) of the immediately preceding sentence the Company shall be required to pay the Holder \$1,000. The Holder shall provide the Company written notice indicating the amounts payable to the Holder in respect of the Buy-In and, upon request of the Company, evidence of the amount of such loss. Nothing herein shall limit a Holder's right to pursue any other remedies available to it hereunder, at law or in equity including, without limitation, a decree of specific performance and/or injunctive relief with respect to the Company's failure to timely deliver shares of Common Stock upon exercise of the Warrant as required pursuant to the terms hereof.

v. No Fractional Shares or Scrip. No fractional shares or scrip representing fractional shares shall be issued upon the exercise of this Warrant. As to any fraction of a share which the Holder would otherwise be entitled to purchase upon such exercise, the Company shall, at its election, either pay a cash adjustment in respect of such final fraction in an amount equal to such fraction multiplied by the Exercise Price or round up to the next whole share.

vi. Charges, Taxes and Expenses. Issuance of Warrant Shares shall be made without charge to the Holder for any issue or transfer tax or other incidental expense in respect of the issuance of such Warrant Shares, all of which taxes and expenses shall be paid by the Company, and such Warrant Shares shall be issued in the name of the Holder or in such name or names as may be directed by the Holder; provided, however, that, in the event that Warrant Shares are to be issued in a name other than the name of the Holder, this Warrant when surrendered for exercise shall be accompanied by the Assignment Form attached hereto duly executed by the Holder and the Company may require, as a condition thereto, the payment of a sum sufficient to reimburse it for any transfer tax incidental thereto. The Company shall pay all Transfer Agent fees required for same-day processing of any Notice of Exercise and all fees to the Depository Trust Company (or another established clearing corporation performing similar functions) required for same-day electronic delivery of the Warrant Shares.

vii. Closing of Books. The Company will not close its stockholder books or records in any manner which prevents the timely exercise of this Warrant, pursuant to the terms hereof.

e) Holder's Exercise Limitations. The Company shall not effect any exercise of this Warrant, and a Holder shall not have the right to exercise any portion of this Warrant, pursuant to Section 2 or otherwise, to the extent that after giving effect to such issuance after exercise as set forth on the applicable Notice of Exercise, the Holder (together with the Holder's Affiliates, and any other Persons acting as a group together with the Holder or any of the Holder's Affiliates (such Persons, "Attribution Parties")), would beneficially own in excess of the Beneficial Ownership Limitation (as defined below). For purposes of the foregoing sentence, the number of shares of Common Stock beneficially owned by the Holder and its Affiliates and Attribution Parties shall include the number of shares of Common Stock issuable upon exercise of this Warrant with respect to which such determination is being made, but shall exclude the number of shares of Common Stock which would be issuable upon (i) exercise of the remaining, nonexercised portion of this Warrant beneficially owned by the Holder or any of its Affiliates or Attribution Parties and (ii) exercise or conversion of the unexercised or nonconverted portion of any other securities of the Company (including, without limitation, any other Common Stock Equivalents) subject to a limitation on conversion or exercise analogous to the limitation contained herein beneficially owned by the Holder or any of its Affiliates or Attribution Parties. Except as set forth in the preceding sentence, for purposes of this Section 2(e), beneficial ownership shall be calculated in accordance with Section 13(d) of the Exchange Act and the rules and regulations promulgated thereunder, it being acknowledged by the Holder that the Company is not representing to the Holder that such calculation is in compliance with Section 13(d) of the Exchange Act and the Holder is solely responsible for any schedules required to be filed in accordance therewith. To the extent that the limitation contained in this Section 2(e) applies, the determination of whether this Warrant is exercisable (in relation to other securities owned by the Holder together with any Affiliates and Attribution Parties) and of which portion of this Warrant is exercisable shall be in the sole discretion of the Holder, and the submission of a Notice of Exercise shall be deemed to be the Holder's determination of whether this Warrant is exercisable (in relation to other securities owned by the Holder together with any Affiliates and Attribution Parties) and of which portion of this Warrant is exercisable, in each case subject to the Beneficial Ownership Limitation, and the Company shall have no obligation to verify or confirm the accuracy of such determination. In addition, a determination as to any group status as contemplated above shall be determined in accordance with Section 13(d) of the Exchange Act and the rules and regulations promulgated thereunder. For purposes of this Section 2(e), in determining the number of outstanding shares of Common Stock, a Holder may rely on the number of outstanding shares of Common Stock as reflected in (A) the Company's most recent periodic or annual report filed with the Commission, as the case may be, (B) a more recent public announcement by the Company or (C) a more recent written notice by the Company or the Transfer Agent setting forth the number of shares of Common Stock outstanding. Upon the written or oral request of a Holder, the Company shall within one Trading Day confirm orally and in writing to the Holder the number of shares of Common Stock then outstanding. In any case, the number of outstanding shares of Common Stock shall be determined after giving effect to the conversion or exercise of securities of the Company, including this Warrant, by the Holder or its Affiliates or Attribution Parties since the date as of which such number of outstanding shares of Common Stock was reported. The "Beneficial Ownership Limitation" shall be 4.99% (or, upon election by a Holder prior to the issuance of any Warrants, 9.99%) of the number of shares of the Common Stock outstanding immediately after giving effect to the issuance of shares of Common Stock issuable upon exercise of this Warrant. The Holder, upon notice to the Company, may increase or decrease the Beneficial Ownership Limitation provisions of this Section 2(e), provided that the Beneficial Ownership Limitation in no event exceeds 9.99% of the number of shares of the Common Stock outstanding immediately after giving effect to the issuance of shares of Common Stock upon exercise of this Warrant held by the Holder and the provisions of this Section 2(e) shall continue to apply. Any increase in the Beneficial Ownership Limitation will not be effective until the 61st day after such notice is delivered to the Company. The provisions of this paragraph shall be construed and implemented in a manner otherwise than in strict conformity with the terms of this Section 2(e) to correct this paragraph (or any portion hereof) which may be defective or inconsistent with the intended Beneficial Ownership Limitation herein contained or to make changes or supplements necessary or desirable to properly give effect to such limitation. The limitations contained in this paragraph shall apply to a successor holder of this Warrant.

Section 3. Certain Adjustments.

a) Stock Dividends and Splits. If the Company, at any time while this Warrant is outstanding: (i) pays a stock dividend or otherwise makes a distribution or distributions on shares of its Common Stock or any other equity or equity equivalent securities payable in shares of Common Stock (which, for avoidance of doubt, shall not include any shares of Common Stock issued by the Company upon exercise of this Warrant), (ii) subdivides outstanding shares of Common Stock into a larger number of shares, (iii) combines (including by way of reverse stock split) outstanding shares of Common Stock into a smaller number of shares, or (iv) issues by reclassification of shares of the Common Stock any shares of capital stock of the Company, then in each case the Exercise Price shall be multiplied by a fraction of which the numerator shall be the number of shares of Common Stock (excluding treasury shares, if any) outstanding immediately before such event and of which the denominator shall be the number of shares of Common Stock outstanding immediately after such event, and the number of shares issuable upon exercise of this Warrant shall be proportionately adjusted such that the aggregate Exercise Price of this Warrant shall remain unchanged. Any adjustment made pursuant to this Section 3(a) shall become effective immediately after the record date for the determination of stockholders entitled to receive such dividend or distribution and shall become effective immediately after the effective date in the case of a subdivision, combination or re-classification.

b) Reserved.

c) Subsequent Rights Offerings. In addition to any adjustments pursuant to Section 3(a) above, if at any time the Company grants, issues or sells any Common Stock Equivalents or rights to purchase stock, warrants, securities or other property pro rata to the record holders of any class of shares of Common Stock (the "Purchase Rights"), then the Holder will be entitled to acquire, upon the terms applicable to such Purchase Rights, the aggregate Purchase Rights which the Holder could have acquired if the Holder had held the number of shares of Common Stock acquirable upon complete exercise of this Warrant (without regard to any limitations on exercise hereof, including without limitation, the Beneficial Ownership Limitation) immediately before the date on which a record is taken for the grant, issuance or sale of such Purchase Rights, or, if no such record is taken, the date as of which the record holders of shares of Common Stock are to be determined for the grant, issue or sale of such Purchase Rights (provided, however, that, to the extent that the Holder's right to participate in any such Purchase Right would result in the Holder exceeding the Beneficial Ownership Limitation, then the Holder shall not be entitled to participate in such Purchase Right to such extent (or beneficial ownership of such shares of Common Stock as a result of such Purchase Right to such extent) and such Purchase Right to such extent shall be held in abeyance for the Holder until such time, if ever, as its right thereto would not result in the Holder exceeding the Beneficial Ownership Limitation).

d) Pro Rata Distributions. During such time as this Warrant is outstanding, if the Company shall declare or make any dividend or other distribution of its assets (or rights to acquire its assets) to holders of shares of Common Stock, by way of return of capital or otherwise (including, without limitation, any distribution of cash, stock or other securities, property or options by way of a dividend, spin off, reclassification, corporate rearrangement, scheme of arrangement or other similar transaction) (a "Distribution"), at any time after the issuance of this Warrant, then, in each such case, the Holder shall be entitled to participate in such Distribution to the same extent that the Holder would have participated therein if the Holder had held the number of shares of Common Stock acquirable upon complete exercise of this Warrant (without regard to any limitations on exercise hereof, including without limitation, the Beneficial Ownership Limitation) immediately before the date of which a record is taken for such Distribution, or, if no such record is taken, the date as of which the record holders of shares of Common Stock are to be determined for the participation in such Distribution (provided, however, that, to the extent that the Holder's right to participate in any such Distribution would result in the Holder exceeding the Beneficial Ownership Limitation, then the Holder shall not be entitled to participate in such Distribution to such extent (or in the beneficial ownership of any shares of Common Stock as a result of such Distribution to such extent) and the portion of such Distribution shall be held in abeyance for the benefit of the Holder until such time, if ever, as its right thereto would not result in the Holder exceeding the Beneficial Ownership Limitation).

e) Fundamental Transaction. If, at any time while this Warrant is outstanding, (i) the Company, directly or indirectly, in one or more related transactions effects any merger or consolidation of the Company with or into another Person, (ii) the Company or any Subsidiary, directly or indirectly, effects any sale, lease, license, assignment, transfer, conveyance or other disposition of all or substantially all of its assets in one or a series of related transactions, (iii) any, direct or indirect, purchase offer, tender offer or exchange offer (whether by the Company or another Person) is completed pursuant to which holders of Common Stock are permitted to sell, tender or exchange their shares for other securities, cash or property and has been accepted by the holders of 50% or more of the outstanding Common Stock or 50% or more of the voting power of the common equity of the Company, (iv) the Company, directly or indirectly, in one or more related transactions effects any reclassification, reorganization or recapitalization of the Common Stock or any compulsory share exchange pursuant to which the Common Stock is effectively converted into or exchanged for other securities, cash or property, or (v) the Company, directly or indirectly, in one or more related transactions consummates a stock or share purchase agreement or other business combination (including, without limitation, a reorganization, recapitalization, spin-off, merger or scheme of arrangement) with another Person or group of Persons whereby such other Person or group acquires 50% or more of the outstanding shares of Common Stock or 50% or more of the voting power of the common equity of the Company (each a “Fundamental Transaction”), then, upon any subsequent exercise of this Warrant, the Holder shall have the right to receive, for each Warrant Share that would have been issuable upon such exercise immediately prior to the occurrence of such Fundamental Transaction, at the option of the Holder (without regard to any limitation in Section 2(e) on the exercise of this Warrant), the number of shares of Common Stock of the successor or acquiring corporation or of the Company, if it is the surviving corporation, and any additional consideration (the “Alternate Consideration”) receivable as a result of such Fundamental Transaction by a holder of the number of shares of Common Stock for which this Warrant is exercisable immediately prior to such Fundamental Transaction (without regard to any limitation in Section 2(e) on the exercise of this Warrant). For purposes of any such exercise, the determination of the Exercise Price shall be appropriately adjusted to apply to such Alternate Consideration based on the amount of Alternate Consideration issuable in respect of one share of Common Stock in such Fundamental Transaction, and the Company shall apportion the Exercise Price among the Alternate Consideration in a reasonable manner reflecting the relative value of any different components of the Alternate Consideration. If holders of Common Stock are given any 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 Alternate Consideration it receives upon any exercise of this Warrant following such Fundamental Transaction. Notwithstanding anything to the contrary, in the event of a Fundamental Transaction, the Company or any Successor Entity (as defined below) shall, at the Holder’s option, exercisable at any time concurrently with, or within 30 days after, the consummation of the Fundamental Transaction (or, if later, the date of the public announcement of the applicable Fundamental Transaction), purchase this Warrant from the Holder by paying to the Holder an amount of cash equal to the Black Scholes Value (as defined below) of the remaining unexercised portion of this Warrant on the date of the consummation of such Fundamental Transaction; provided, however, that, if the Fundamental Transaction is not within the Company’s control, including not approved by the Company’s Board of Directors, Holder shall only be entitled to receive from the Company or any Successor Entity the same type or form of consideration (and in the same proportion), at the Black Scholes Value of the unexercised portion of this Warrant, that is being offered and paid to the holders of Common Stock of the Company in connection with the Fundamental Transaction, whether that consideration be in the form of cash, stock or any combination thereof, or whether the holders of Common Stock are given the choice to receive from among alternative forms of consideration in connection with the Fundamental Transaction; provided, further, that if holders of Common Stock of the Company are not offered or paid any consideration in such Fundamental Transaction, such holders of Common Stock will be deemed to have received common stock of the Successor Entity (which Entity may be the Company following such Fundamental Transaction) in such Fundamental Transaction. “Black Scholes Value” means the value of this Warrant based on the Black-Scholes Option Pricing Model obtained from the “OV” function on Bloomberg, L.P. (“Bloomberg”) determined as of the day of consummation of the applicable contemplated Fundamental Transaction for pricing purposes and reflecting (A) a risk-free interest rate corresponding to the U.S. Treasury rate for a period equal to the time between the date of the public announcement of the applicable Fundamental Transaction and the Termination Date, (B) an expected volatility equal to the greater of 100% and the 100 day volatility obtained from the HVT function on Bloomberg (determined utilizing a 365 day annualization factor) as of the Trading Day immediately following the public announcement of the applicable contemplated Fundamental Transaction, (C) the underlying price per share used in such calculation shall be the greater of (i) the sum of the price per share being offered in cash, if any, plus the value of any non-cash consideration, if any, being offered in such Fundamental Transaction and (ii) the highest VWAP during the period beginning on the Trading Day immediately preceding the public announcement of the applicable contemplated Fundamental Transaction (or the consummation of the applicable Fundamental Transaction, if earlier) and ending on the Trading Day of the Holder’s request pursuant to this Section 3(e) and (D) a remaining option time equal to the time between the date of the public announcement of the applicable contemplated Fundamental Transaction and the Termination Date [and (E) a zero cost of borrow. The payment of the Black Scholes Value will be made by wire transfer of immediately available funds (or such other consideration) within five Business Days of the Holder’s election (or, if later, on the date of consummation of the Fundamental Transaction). The Company shall cause any successor entity in a Fundamental Transaction in which the Company is not the survivor (the “Successor Entity”) to assume in writing all of the obligations of the Company under this Warrant in accordance with the provisions of this Section 3(e) pursuant to written agreements in form and substance reasonably satisfactory to the Holder and approved by the Holder (without unreasonable delay) prior to such Fundamental Transaction and shall, at the option of the Holder, deliver to the Holder in exchange for this Warrant a security of the Successor Entity evidenced by a written instrument substantially similar in form and substance to this Warrant which is exercisable for a corresponding number of shares of capital stock of such Successor Entity (or its parent entity) equivalent to the shares of Common Stock acquirable and receivable upon exercise of this Warrant (without regard to any limitations on the exercise of this Warrant) prior to such Fundamental Transaction, and with an exercise price which applies the exercise price hereunder to such shares of capital stock (but taking into account the relative value of the shares of Common Stock pursuant to such Fundamental Transaction and the value of such shares of capital stock, such number of shares of capital stock and such exercise price being for the purpose of protecting the economic value of this Warrant immediately prior to the consummation of such Fundamental Transaction), and which is reasonably satisfactory in form and substance to the Holder. Upon the occurrence of any such Fundamental Transaction, the Successor Entity shall be added to the term “Company” under this Warrant (so that from and after the occurrence or consummation of such Fundamental Transaction, each and every provision of this Warrant and the other Transaction Documents referring to the “Company” shall refer instead to each of the Company and the Successor Entity or Successor Entities, jointly and severally), and the Successor Entity or Successor Entities, jointly and severally with the Company, may exercise every right and power of the Company prior thereto and the Successor Entity or Successor Entities shall assume all of the obligations of the Company prior thereto under this Warrant and the other Transaction Documents with the same effect as if the Company and such

Successor Entity or Successor Entities, jointly and severally, had been named as the Company herein. For the avoidance of doubt, the Holder shall be entitled to the benefits of the provisions of this Section 3(e) regardless of (i) whether the Company has sufficient authorized shares of Common Stock for the issuance of Warrant Shares and/or (ii) whether a Fundamental Transaction occurs prior to the Initial Exercise Date.

f) Calculations. All calculations under this Section 3 shall be made to the nearest cent or the nearest 1/100th of a share, as the case may be. For purposes of this Section 3, the number of shares of Common Stock deemed to be issued and outstanding as of a given date shall be the sum of the number of shares of Common Stock (excluding treasury shares, if any) issued and outstanding.

g) Notice to Holder.

i. Adjustment to Exercise Price. Whenever the Exercise Price is adjusted pursuant to any provision of this Section 3, the Company shall promptly deliver to the Holder by email a notice setting forth the Exercise Price after such adjustment and any resulting adjustment to the number of Warrant Shares and setting forth a brief statement of the facts requiring such adjustment.

ii. Notice to Allow Exercise by Holder. If (A) the Company shall declare a dividend (or any other distribution in whatever form) on the Common Stock, (B) the Company shall declare a special nonrecurring cash dividend on or a redemption of the Common Stock, (C) the Company shall authorize the granting to all holders of the Common Stock rights or warrants to subscribe for or purchase any shares of capital stock of any class or of any rights, (D) the approval of any stockholders of the Company shall be required in connection with any reclassification of the Common Stock, any consolidation or merger to which the Company (or any of its Subsidiaries) is a party, any sale or transfer of all or substantially all of its assets, or any compulsory share exchange whereby the Common Stock is converted into other securities, cash or property, or (E) the Company shall authorize the voluntary or involuntary dissolution, liquidation or winding up of the affairs of the Company, then, in each case, the Company shall cause to be delivered by email to the Holder at its last email address as it shall appear upon the Warrant Register of the Company, at least 20 calendar days prior to the applicable record or effective date hereinafter specified, a notice stating (x) the date on which a record is to be taken for the purpose of such dividend, distribution, redemption, rights or warrants, or if a record is not to be taken, the date as of which the holders of the Common Stock of record to be entitled to such dividend, distributions, redemption, rights or warrants are to be determined or (y) the date on which such reclassification, consolidation, merger, sale, transfer or share exchange is expected to become effective or close, and the date as of which it is expected that holders of the Common Stock of record shall be entitled to exchange their shares of the Common Stock for securities, cash or other property deliverable upon such reclassification, consolidation, merger, sale, transfer or share exchange; provided that the failure to deliver such notice or any defect therein or in the delivery thereof shall not affect the validity of the corporate action required to be specified in such notice. To the extent that any notice provided in this Warrant constitutes, or contains, material, non-public information regarding the Company or any of the Subsidiaries, the Company shall simultaneously file such notice with the Commission pursuant to a Current Report on Form 8-K. The Holder shall remain entitled to exercise this Warrant during the period commencing on the date of such notice to the effective date of the event triggering such notice except as may otherwise be expressly set forth herein.

h) Voluntary Adjustment By Company. Subject to the rules and regulations of the Trading Market, the Company may at any time during the term of this Warrant, subject to the prior written consent of the Holder, reduce the then current Exercise Price to any amount and for any period of time deemed appropriate by the board of directors of the Company.

Section 4. Transfer of Warrant.

a) Transferability. This Warrant and all rights hereunder (including, without limitation, any registration rights) are transferable, in whole or in part, upon surrender of this Warrant at the principal office of the Company or its designated agent, together with a written assignment of this Warrant substantially in the form attached hereto duly executed by the Holder or its agent or attorney and funds sufficient to pay any transfer taxes payable upon the making of such transfer. Upon such surrender and, if required, such payment, the Company shall execute and deliver a new Warrant or Warrants in the name of the assignee or assignees, as applicable, and in the denomination or denominations specified in such instrument of assignment, and shall issue to the assignor a new Warrant evidencing the portion of this Warrant not so assigned, and this Warrant shall promptly be cancelled. Notwithstanding anything herein to the contrary, the Holder shall not be required to physically surrender this Warrant to the Company unless the Holder has assigned this Warrant in full, in which case, the Holder shall surrender this Warrant to the Company within three (3) Trading Days of the date on which the Holder delivers an assignment form to the Company assigning this Warrant in full. The Warrant, if properly assigned in accordance herewith, may be exercised by a new holder for the purchase of Warrant Shares without having a new Warrant issued.

b) New Warrants. If this Warrant is not held in global form through DTC (or any successor depository), this Warrant may be divided or combined with other Warrants upon presentation hereof at the aforesaid office of the Company, together with a written notice specifying the names and denominations in which new Warrants are to be issued, signed by the Holder or its agent or attorney. Subject to compliance with Section 4(a), as to any transfer which may be involved in such division or combination, the Company shall execute and deliver a new Warrant or Warrants in exchange for the Warrant or Warrants to be divided or combined in accordance with such notice. All Warrants issued on transfers or exchanges shall be dated the initial issuance date of this Warrant and shall be identical with this Warrant except as to the number of Warrant Shares issuable pursuant thereto.

c) Warrant Register. The Warrant Agent shall register this Warrant, upon records to be maintained by the Warrant Agent for that purpose (the “Warrant Register”), in the name of the record Holder hereof from time to time. The Company and the Warrant Agent may deem and treat the registered Holder of this Warrant as the absolute owner hereof for the purpose of any exercise hereof or any distribution to the Holder, and for all other purposes, absent actual notice to the contrary.

Section 5. Miscellaneous.

a) No Rights as Stockholder Until Exercise; No Settlement in Cash. This Warrant does not entitle the Holder to any voting rights, dividends or other rights as a stockholder of the Company prior to the exercise hereof as set forth in Section 2(d) (i), except as expressly set forth in Section 3. Without limiting any rights of a Holder to receive Warrant Shares on a “cashless exercise” pursuant to Section 2(c) or to receive cash payments pursuant to Section 2(d)(i) and Section 2(d)(iv) herein, in no event shall the Company be required to net cash settle an exercise of this Warrant.

b) Loss, Theft, Destruction or Mutilation of Warrant. The Company covenants that upon receipt by the Company of evidence reasonably satisfactory to it of the loss, theft, destruction or mutilation of this Warrant or any stock certificate relating to the Warrant Shares, and in case of loss, theft or destruction, of indemnity or security reasonably satisfactory to it (which, in the case of the Warrant, shall not include the posting of any bond), and upon surrender and cancellation of such Warrant or stock certificate, if mutilated, the Company will make and deliver a new Warrant or stock certificate of like tenor and dated as of such cancellation, in lieu of such Warrant or stock certificate.

c) Saturdays, Sundays, Holidays, etc. If the last or appointed day for the taking of any action or the expiration of any right required or granted herein shall not be a Business Day, then such action may be taken or such right may be exercised on the next succeeding Business Day.

d) Authorized Shares.

The Company covenants that, during the period the Warrant is outstanding, it will reserve from its authorized and unissued Common Stock a sufficient number of shares to provide for the issuance of the Warrant Shares upon the exercise of any purchase rights under this Warrant. The Company further covenants that its issuance of this Warrant shall constitute full authority to its officers who are charged with the duty of issuing the necessary Warrant Shares upon the exercise of the purchase rights under this Warrant. The Company will take all such reasonable action as may be necessary to assure that such Warrant Shares may be issued as provided herein without violation of any applicable law or regulation, or of any requirements of the Trading Market upon which the Common Stock may be listed. The Company covenants that all Warrant Shares which may be issued upon the exercise of the purchase rights represented by this Warrant will, upon exercise of the purchase rights represented by this Warrant and payment for such Warrant Shares in accordance herewith, be duly authorized, validly issued, fully paid and nonassessable and free from all taxes, liens and charges created by the Company in respect of the issue thereof (other than taxes in respect of any transfer occurring contemporaneously with such issue).

Except and to the extent as waived or consented to by the Holder, the Company shall not by any action, including, without limitation, amending its certificate of incorporation or through any reorganization, transfer of assets, consolidation, merger, dissolution, issue or sale of securities or any other voluntary action, avoid or seek to avoid the observance or performance of any of the terms of this Warrant, but will at all times in good faith assist in the carrying out of all such terms and in the taking of all such actions as may be necessary or appropriate to protect the rights of Holder as set forth in this Warrant against impairment. Without limiting the generality of the foregoing, the Company will (i) not increase the par value of any Warrant Shares above the amount payable therefor upon such exercise immediately prior to such increase in par value, (ii) take all such action as may be necessary or appropriate in order that the Company may validly and legally issue fully paid and nonassessable Warrant Shares upon the exercise of this Warrant and (iii) use commercially reasonable efforts to obtain all such authorizations, exemptions or consents from any public regulatory body having jurisdiction thereof, as may be, necessary to enable the Company to perform its obligations under this Warrant.

Before taking any action which would result in an adjustment in the number of Warrant Shares for which this Warrant is exercisable or in the Exercise Price, the Company shall obtain all such authorizations or exemptions thereof, or consents thereto, as may be necessary from any public regulatory body or bodies having jurisdiction thereof.

e) Governing Law. All questions concerning the construction, validity, enforcement and interpretation of this Warrant shall be governed by and construed and enforced in accordance with the internal laws of the State of New York, without regard to the principles of conflicts of law thereof. Each party agrees that all legal proceedings concerning the interpretations, enforcement and defense of the transactions contemplated by this Warrant (whether brought against a party hereto or their respective affiliates, directors, officers, shareholders, partners, members, employees or agents) shall be commenced exclusively in the state and federal courts sitting in the City of New York. Each party hereby irrevocably submits to the exclusive jurisdiction of the state and federal courts sitting in the City of New York, Borough of Manhattan for the adjudication of any dispute hereunder or in connection herewith or with any transaction contemplated hereby or discussed herein, and hereby irrevocably waives, and agrees not to assert in any suit, action or proceeding, any claim that it is not personally subject to the jurisdiction of any such court, that such suit, action or proceeding is improper or is an inconvenient venue for such proceeding. Each party hereby irrevocably waives personal service of process and consents to process being served in any such suit, action or proceeding by mailing a copy thereof via registered or certified mail or overnight delivery (with evidence of delivery) to such party at the address in effect for notices to it under this Warrant and agrees that such service shall constitute good and sufficient service of process and notice thereof. Nothing contained herein shall be deemed to limit in any way any right to serve process in any other manner permitted by law. If either party shall commence an action, suit or proceeding to enforce any provisions of this Warrant, the prevailing party in such action, suit or proceeding shall be reimbursed by the other party for their reasonable attorneys' fees and other costs and expenses incurred with the investigation, preparation and prosecution of such action or proceeding. **Notwithstanding the foregoing, this exclusive forum provision shall not apply to suits brought to enforce a duty or liability created by the Exchange Act, any other claim for which the federal courts have exclusive jurisdiction or any complaint asserting a cause of action arising under the Securities Act against us or any of our directors, officers, other employees or agents. Section 27 of the Exchange Act creates exclusive federal jurisdiction over all suits brought to enforce any duty or liability created by the Exchange Act or the rules and regulations thereunder.**

f) Restrictions. The Holder acknowledges that the Warrant Shares acquired upon the exercise of this Warrant, if not registered, and the Holder does not utilize cashless exercise, will have restrictions upon resale imposed by state and federal securities laws.

g) Nonwaiver and Expenses. No course of dealing or any delay or failure to exercise any right hereunder on the part of Holder shall operate as a waiver of such right or otherwise prejudice the Holder's rights, powers or remedies. Without limiting any other provision of this Warrant, if the Company willfully and knowingly fails to comply with any provision of this Warrant, which results in any material damages to the Holder, the Company shall pay to the Holder such amounts as shall be sufficient to cover any costs and expenses including, but not limited to, reasonable attorneys' fees, including those of appellate proceedings, incurred by the Holder in collecting any amounts due pursuant hereto or in otherwise enforcing any of its rights, powers or remedies hereunder.

h) Notices. Any and all notices or other communications or deliveries to be provided by the Holders hereunder including, without limitation, any Notice of Exercise, shall be in writing and delivered personally, by e-mail, or sent by a nationally recognized overnight courier service, addressed to the Company, at 2 Burlington Woods Drive, Suite 100, Burlington, MA 01803 Attention: Mr. Jeffrey Frelick, Chief Executive Officer, email address: ###, or such other email address or address as the Company may specify for such purposes by notice to the Holders. Any and all notices or other communications or deliveries to be provided by the Company hereunder shall be in writing and delivered personally, by e-mail, or sent by a nationally recognized overnight courier service addressed to each Holder at the e-mail address or address of such Holder appearing on the books of the Company. Any notice or other communication or deliveries hereunder shall be deemed given and effective on the earliest of (i) the time of transmission, if such notice or communication is delivered via e-mail at the e-mail address set forth in this Section prior to 5:30 p.m. (New York City time) on any date, (ii) the next Trading Day after the time of transmission, if such notice or communication is delivered via e-mail at the e-mail address set forth in this Section on a day that is not a Trading Day or later than 5:30 p.m. (New York City time) on any Trading Day, (iii) the second Trading Day following the date of mailing, if sent by U.S. nationally recognized overnight courier service, or (iv) upon actual receipt by the party to whom such notice is required to be given. To the extent that any notice provided hereunder constitutes, or contains, material, non-public information regarding the Company or any Subsidiaries, the Company shall simultaneously file such notice with the Commission pursuant to a Current Report on Form 8-K.

i) Limitation of Liability. No provision hereof, in the absence of any affirmative action by the Holder to exercise this Warrant to purchase Warrant Shares, and no enumeration herein of the rights or privileges of the Holder, shall give rise to any liability of the Holder for the purchase price of any Common Stock or as a stockholder of the Company, whether such liability is asserted by the Company or by creditors of the Company.

j) Remedies. The Holder, in addition to being entitled to exercise all rights granted by law, including recovery of damages, will be entitled to specific performance of its rights under this Warrant. The Company agrees that monetary damages would not be adequate compensation for any loss incurred by reason of a breach by it of the provisions of this Warrant and hereby agrees to waive and not to assert the defense in any action for specific performance that a remedy at law would be adequate.

k) Successors and Assigns. Subject to applicable securities laws, this Warrant and the rights and obligations evidenced hereby shall inure to the benefit of and be binding upon the successors and permitted assigns of the Company and the successors and permitted assigns of Holder. The provisions of this Warrant are intended to be for the benefit of any Holder from time to time of this Warrant and shall be enforceable by the Holder or holder of Warrant Shares.

l) Amendment. This Warrant may be modified or amended or the provisions hereof waived with the written consent of the Company, on the one hand, and the Holder of the beneficial owner of this Warrant, on the other hand.

m) Severability. Wherever possible, each provision of this Warrant shall be interpreted in such manner as to be effective and valid under applicable law, but if any provision of this Warrant shall be prohibited by or invalid under applicable law, such provision shall be ineffective to the extent of such prohibition or invalidity, without invalidating the remainder of such provisions or the remaining provisions of this Warrant.

n) Headings. The headings used in this Warrant are for the convenience of reference only and shall not, for any purpose, be deemed a part of this Warrant.

o) Warrant Agency Agreement. If this Warrant is held in global form through DTC (or any successor depositary), this Warrant is issued subject to the Warrant Agency Agreement. To the extent any provision of this Warrant conflicts with the express provisions of the Warrant Agency Agreement, the provisions of this Warrant shall govern and be controlling.

(Signature Page Follows)

IN WITNESS WHEREOF, the Company has caused this Warrant to be executed by its officer thereunto duly authorized as of the date first above indicated.

BONE BIOLOGICS CORPORATION

By: _____
Name: Jeffrey Frelick
Title: Chief Executive Officer

NOTICE OF EXERCISE

TO: BONE BIOLOGICS CORPORATION

- (1) The undersigned hereby elects to purchase _____ Warrant Shares of the Company pursuant to the terms of the attached Warrant (only if exercised in full), and tenders herewith payment of the exercise price in full, together with all applicable transfer taxes, if any.
- (2) Payment shall take the form of (check applicable box):

☐ in lawful money of the United States; or

☐ if permitted the cancellation of such number of Warrant Shares as is necessary, in accordance with the formula set forth in subsection 2(c), to exercise this Warrant with respect to the maximum number of Warrant Shares purchasable pursuant to the cashless exercise procedure set forth in subsection 2(c).
- (3) Please register and issue said Warrant Shares in the name of the undersigned or in such other name as is specified below:

The Warrant Shares shall be delivered to the following DWAC Account Number or by physical delivery of a certificate to:

[SIGNATURE OF HOLDER]

Name of Investing Entity:

Signature of Authorized Signatory of Investing Entity:

Name of Authorized Signatory:

Title of Authorized Signatory:

Date:

ASSIGNMENT FORM

(To assign the foregoing Warrant, execute this form and supply required information. Do not use this form to exercise the Warrant.)

FOR VALUE RECEIVED, [] all of or [] shares of the foregoing Warrant and all rights evidenced thereby are hereby assigned to

Name: (Please Print)

Address: (Please Print)

Phone Number:

Email Address:

Dated: _____, _____

Holder’s Signature: _____

Holder’s Address: _____

NOTE: The signature to this Assignment Form must correspond with the name as it appears on the face of the Warrant, without alteration or enlargement or any change whatsoever. Officers of corporations and those acting in a fiduciary or other representative capacity should file proper evidence of authority to assign the foregoing Warrant.

[FORM OF SERIES C COMMON STOCK PURCHASE WARRANT]**BONE BIOLOGICS CORPORATION
SERIES C COMMON STOCK PURCHASE WARRANT**

Warrant Shares: _____

Initial Exercise Date: October 12, 2022

THIS SERIES C COMMON STOCK PURCHASE WARRANT (the “Warrant”) certifies that, for value received, [_____] or its assigns (the “Holder”) is entitled, upon the terms and subject to the limitations on exercise and the conditions hereinafter set forth, at any time on or after the date hereof (the “Initial Exercise Date”) and on or prior to 5:00 p.m. (New York City time) on October 12, 2027 (the “Termination Date”) but not thereafter, to subscribe for and purchase from Bone Biologics Corporation, a Delaware corporation (the “Company”), up to [_____] shares (as subject to adjustment hereunder, the “Warrant Shares”) of Common Stock. The purchase price of one share of Common Stock under this Warrant shall be equal to the Exercise Price, as defined in Section 2(b). This Warrant shall initially be issued and maintained in the form of a security held in book-entry form and the Depository Trust Company or its nominee (“DTC”) shall initially be the sole registered holder of this Warrant, subject to a Holder’s right to elect to receive a Warrant in certificated form pursuant to the terms of the Warrant Agency Agreement, in which case this sentence shall not apply.

Section 1. Definitions. In addition to the terms defined elsewhere in this Warrant, the following terms have the meanings indicated in this Section 1:

“Affiliate” means any Person that, directly or indirectly through one or more intermediaries, controls or is controlled by or is under common control with a Person, as such terms are used in and construed under Rule 405 under the Securities Act.

“Bid Price” means, for any date, the price determined by the first of the following clauses that applies: (a) if the Common Stock is then listed or quoted on a Trading Market, the bid price of the Common Stock for the time in question (or the nearest preceding date) on the Trading Market on which the Common Stock is then listed or quoted as reported by Bloomberg L.P. (based on a Trading Day from 9:30 a.m. (New York City time) to 4:02 p.m. (New York City time)), (b) if OTCQB or OTCQX is not a Trading Market, the volume weighted average price of the Common Stock for such date (or the nearest preceding date) on OTCQB or OTCQX as applicable, (c) if the Common Stock is not then listed or quoted for trading on OTCQB or OTCQX and if prices for the Common Stock are then reported on the Pink Open Market (or a similar organization or agency succeeding to its functions of reporting prices), the most recent bid price per share of the Common Stock so reported, or (d) in all other cases, the fair market value of a share of Common Stock as determined by an independent appraiser selected in good faith by the Holders of a majority in interest of the Warrants then outstanding and reasonably acceptable to the Company, the fees and expenses of which shall be paid by the Company.

“Business Day” means any day other than Saturday, Sunday or other day on which commercial banks in The City of New York are authorized or required by law to remain closed; provided, however, for clarification, commercial banks shall not be deemed to be authorized or required by law to remain closed due to “stay at home”, “shelter-in-place”, “non-essential employee” or any other similar orders or restrictions or the closure of any physical branch locations at the direction of any governmental authority so long as the electronic funds transfer systems (including for wire transfers) of commercial banks in The City of New York generally are open for use by customers on such day.

“Commission” means the United States Securities and Exchange Commission.

“Common Stock” means the common stock of the Company, par value \$0.001 per share, and any other class of securities into which such securities may hereafter be reclassified or changed.

“Exchange Act” means the Securities Exchange Act of 1934, as amended, and the rules and regulations promulgated thereunder.

“Person” means an individual or corporation, partnership, trust, incorporated or unincorporated association, joint venture, limited liability company, joint stock company, government (or an agency or subdivision thereof) or other entity of any kind.

“Registration Statement” means the Company’s registration statement on Form S-1 (File No. 333-267588).

“Securities Act” means the Securities Act of 1933, as amended, and the rules and regulations promulgated thereunder.

“Subsidiary” means any subsidiary of the Company and shall, where applicable, also include any direct or indirect subsidiary of the Company formed or acquired after the date hereof.

“Trading Day” means a day on which the Common Stock is traded on a Trading Market.

“Trading Market” means any of the following markets or exchanges on which the Common Stock is listed or quoted for trading on the date in question: the NYSE American, the Nasdaq Capital Market, the Nasdaq Global Market, the Nasdaq Global Select Market, the New York Stock Exchange, OTCQB or OTCQX (or any successors to any of the foregoing).

“Transfer Agent” means Equiniti Trust Company, the current transfer agent of the Company, with a mailing address of 1110 Centre Pointe Curve, Mendota Heights, MN 55120, and any successor transfer agent of the Company.

“Underwriting Agreement” means the underwriting agreement, dated as of October 7, 2022, among the Company and WallachBeth Capital, LLC as representative of the underwriters named therein, as amended, modified or supplemented from time to time in accordance with its terms.

“VWAP” means, for any date, the price determined by the first of the following clauses that applies: (a) if the Common Stock is then listed or quoted on a Trading Market, the daily volume weighted average price of the Common Stock for such date (or the nearest preceding date) on the Trading Market on which the Common Stock is then listed or quoted as reported by Bloomberg L.P. (based on a Trading Day from 9:30 a.m. (New York City time) to 4:02 p.m. (New York City time)), (b) if OTCQB or OTCQX is not a Trading Market, the volume weighted average price of the Common Stock for such date (or the nearest preceding date) on OTCQB or OTCQX as applicable, (c) if the Common Stock is not then listed or quoted for trading on OTCQB or OTCQX and if prices for the Common Stock are then reported on the Pink Open Market (or a similar organization or agency succeeding to its functions of reporting prices), the most recent bid price per share of the Common Stock so reported, or (d) in all other cases, the fair market value of a share of Common Stock as determined by an independent appraiser selected in good faith by the holders of a majority in interest of the Common Stock Purchase Warrants then outstanding and reasonably acceptable to the Company, the fees and expenses of which shall be paid by the Company.

“Warrant Agency Agreement” means that certain warrant agent agreement, dated on or about the Initial Exercise Date, between the Company and the Warrant Agent.

“Warrant Agent” means the Transfer Agent and any successor warrant agent of the Company.

“Warrants” means this Warrant and other Common Stock purchase warrants issued by the Company pursuant to the Registration Statement.

Section 2. Exercise.

a) Exercise of Warrant. Exercise of the purchase rights represented by this Warrant may be made, in whole or in part, at any time or times on or after the Initial Exercise Date and on or before the Termination Date by delivery to the Company of a duly executed PDF copy submitted by e-mail (or e-mail attachment) of the Notice of Exercise in the form annexed hereto (the “Notice of Exercise”). Within the earlier of (i) two (2) Trading Days and (ii) the number of Trading Days comprising the Standard Settlement Period (as defined in Section 2(d)(i) herein) following the date of exercise as aforesaid, the Holder shall deliver the aggregate Exercise Price for the shares specified in the applicable Notice of Exercise by wire transfer or cashier’s check drawn on a United States bank unless the cashless exercise procedure specified in Section 2(c) below is specified in the applicable Notice of Exercise. No ink-original Notice of Exercise shall be required, nor shall any medallion guarantee (or other type of guarantee or notarization) of any Notice of Exercise be required. Notwithstanding anything herein to the contrary, the Holder shall not be required to physically surrender this Warrant to the Company until the Holder has purchased all of the Warrant Shares available hereunder and the Warrant has been exercised in full, in which case, the Holder shall surrender this Warrant to the Company for cancellation within three (3) Trading Days of the date on which the final Notice of Exercise is delivered to the Company. Partial exercises of this Warrant resulting in purchases of a portion of the total number of Warrant Shares available hereunder shall have the effect of lowering the outstanding number of Warrant Shares purchasable hereunder in an amount equal to the applicable number of Warrant Shares purchased. The Holder and the Company shall maintain records showing the number of Warrant Shares purchased and the date of such purchases. The Company shall deliver any objection to any Notice of Exercise within one (1) Business Day of receipt of such notice. **The Holder and any assignee, by acceptance of this Warrant, acknowledge and agree that, by reason of the provisions of this paragraph, following the purchase of a portion of the Warrant Shares hereunder, the number of Warrant Shares available for purchase hereunder at any given time may be less than the amount stated on the face hereof.**

Notwithstanding the foregoing in this Section 2(a), a holder whose interest in this Warrant is a beneficial interest in certificate(s) representing this Warrant held in book-entry form through DTC (or another established clearing corporation performing similar functions), shall effect exercises made pursuant to this Section 2(a) by delivering to DTC (or such other clearing corporation, as applicable) the appropriate instruction form for exercise, complying with the procedures to effect exercise that are required by DTC (or such other clearing corporation, as applicable), subject to a Holder's right to elect to receive a Warrant in certificated form pursuant to the terms of the Warrant Agency Agreement, in which case this sentence shall not apply.

b) Exercise Price. The exercise price per share of Common Stock under this Warrant shall be \$2.16, subject to adjustment hereunder (the "Exercise Price").

c) Cashless Exercise. If at the time of exercise hereof there is no effective registration statement registering, or the prospectus contained therein is not available for the issuance of the Warrant Shares to the Holder, then this Warrant may also be exercised, in whole or in part, at such time by means of a "cashless exercise" in which the Holder shall be entitled to receive a number of Warrant Shares equal to the quotient obtained by dividing [(A-B) (X)] by (A), where:

(A) = as applicable: (i) the VWAP on the Trading Day immediately preceding the date of the applicable Notice of Exercise if such Notice of Exercise is (1) both executed and delivered pursuant to Section 2(a) hereof on a day that is not a Trading Day or (2) both executed and delivered pursuant to Section 2(a) hereof on a Trading Day prior to the opening of "regular trading hours" (as defined in Rule 600(b) of Regulation NMS promulgated under the federal securities laws) on such Trading Day, (ii) at the option of the Holder, either (y) the VWAP on the Trading Day immediately preceding the date of the applicable Notice of Exercise or (z) the Bid Price of the Common Stock on the principal Trading Market as reported by Bloomberg L.P. as of the time of the Holder's execution of the applicable Notice of Exercise if such Notice of Exercise is executed during "regular trading hours" on a Trading Day and is delivered within two (2) hours thereafter (including until two (2) hours after the close of "regular trading hours" on a Trading Day) pursuant to Section 2(a) hereof or (iii) the VWAP on the date of the applicable Notice of Exercise if the date of such Notice of Exercise is a Trading Day and such Notice of Exercise is both executed and delivered pursuant to Section 2(a) hereof after the close of "regular trading hours" on such Trading Day;

(B) = the Exercise Price of this Warrant, as adjusted hereunder; and

(X) = the number of Warrant Shares that would be issuable upon exercise of this Warrant in accordance with the terms of this Warrant if such exercise were by means of a cash exercise rather than a cashless exercise.

Notwithstanding anything to the contrary herein, a “cashless exercise” may occur after the earlier of (i) 1 Trading Day from the Initial Exercise Date of this Warrant or (ii) the time when \$10.0 million of volume is traded in the Common Shares, if the VWAP of the Common Shares on any Trading Day on or after the closing date fails to exceed the Exercise Price in effect as of the Initial Exercise Date (subject to adjustment for any stock splits, stock dividends, stock combinations, recapitalizations and similar events). In such event, the aggregate number of Warrant Shares issuable in such cashless exercise pursuant to any given Notice of Exercise electing to effect a cashless exercise shall equal the product of (x) the aggregate number of Warrant Shares that would be issuable upon exercise of this Warrant in accordance with the terms of this Warrant if such exercise were by means of a cash exercise rather than a cashless exercise and (y) 1.00.

If Warrant Shares are issued in such a cashless exercise, the parties acknowledge and agree that in accordance with Section 3(a)(9) of the Securities Act, the Warrant Shares shall take on the registered characteristics of the Warrants being exercised. The Company agrees not to take any position contrary to this Section 2(c).

d) Mechanics of Exercise.

i. Delivery of Warrant Shares Upon Exercise. The Company shall cause the Warrant Shares purchased hereunder to be transmitted by the Transfer Agent to the Holder by crediting the account of the Holder's or its designee's balance account with The Depository Trust Company through its Deposit or Withdrawal at Custodian system ("DWAC") if the Company is then a participant in such system and either (A) there is an effective registration statement permitting the issuance of the Warrant Shares to or resale of the Warrant Shares by Holder or (B) this Warrant is being exercised via cashless exercise, and otherwise by physical delivery of a certificate, registered in the Company's share register in the name of the Holder or its designee, for the number of Warrant Shares to which the Holder is entitled pursuant to such exercise to the address specified by the Holder in the Notice of Exercise by the date that is the earliest of (i) two (2) Trading Days after the delivery to the Company of the Notice of Exercise, (ii) one (1) Trading Day after delivery of the aggregate Exercise Price to the Company and (iii) the number of Trading Days comprising the Standard Settlement Period after the delivery to the Company of the Notice of Exercise (such date, the "Warrant Share Delivery Date"). Upon delivery of the Notice of Exercise, the Holder shall be deemed for all corporate purposes to have become the holder of record of the Warrant Shares with respect to which this Warrant has been exercised, irrespective of the date of delivery of the Warrant Shares, provided that payment of the aggregate Exercise Price (other than in the case of a cashless exercise) is received within the earlier of (i) two (2) Trading Days and (ii) the number of Trading Days comprising the Standard Settlement Period following delivery of the Notice of Exercise. If the Company fails for any reason to deliver to the Holder the Warrant Shares subject to a Notice of Exercise by the Warrant Share Delivery Date, the Company shall pay to the Holder, in cash, as liquidated damages and not as a penalty, for each \$1,000 of Warrant Shares subject to such exercise (based on the VWAP of the Common Stock on the date of the applicable Notice of Exercise), \$10 per Trading Day (increasing to \$20 per Trading Day on the fifth Trading Day after such liquidated damages begin to accrue) for each Trading Day after such Warrant Share Delivery Date until such Warrant Shares are delivered or Holder rescinds such exercise. The Company agrees to maintain a transfer agent that is a participant in the FAST program so long as this Warrant remains outstanding and exercisable. As used herein, "Standard Settlement Period" means the standard settlement period, expressed in a number of Trading Days, on the Company's primary Trading Market with respect to the Common Stock as in effect on the date of delivery of the Notice of Exercise. Notwithstanding the foregoing, with respect to any Notice(s) of Exercise delivered on or prior to 12:00 p.m. (New York City time) on the Initial Exercise Date, which may be delivered at any time after the time of execution of the Underwriting Agreement, the Company agrees to deliver the Warrant Shares subject to such notice(s) by 4:00 p.m. (New York City time) on the Initial Exercise Date and the Initial Exercise Date shall be the Warrant Share Delivery Date for purposes hereunder, provided that payment of the aggregate Exercise Price (other than in the case of a cashless exercise) is received by such Warrant Share Delivery Date.

ii. Delivery of New Warrants Upon Exercise. If this Warrant shall have been exercised in part, the Company shall, at the request of a Holder and upon surrender of this Warrant certificate, at the time of delivery of the Warrant Shares, deliver to the Holder a new Warrant evidencing the rights of the Holder to purchase the unpurchased Warrant Shares called for by this Warrant, which new Warrant shall in all other respects be identical with this Warrant.

iii. Rescission Rights. If the Company fails to cause the Transfer Agent to transmit to the Holder the Warrant Shares pursuant to Section 2(d)(i) by the Warrant Share Delivery Date, then the Holder will have the right to rescind such exercise.

iv. Compensation for Buy-In on Failure to Timely Deliver Warrant Shares Upon Exercise. In addition to any other rights available to the Holder, if the Company fails to cause the Transfer Agent to transmit to the Holder the Warrant Shares in accordance with the provisions of Section 2(d)(i) above pursuant to an exercise on or before the Warrant Share Delivery Date, and if after such date the Holder is required by its broker to purchase (in an open market transaction or otherwise) or the Holder's brokerage firm otherwise purchases, shares of Common Stock to deliver in satisfaction of a sale by the Holder of the Warrant Shares which the Holder anticipated receiving upon such exercise (a "Buy-In"), then the Company shall (A) pay in cash to the Holder the amount, if any, by which (x) the Holder's total purchase price (including brokerage commissions, if any) for the shares of Common Stock so purchased exceeds (y) the amount obtained by multiplying (1) the number of Warrant Shares that the Company was required to deliver to the Holder in connection with the exercise at issue times (2) the price at which the sell order giving rise to such purchase obligation was executed, and (B) at the option of the Holder, either reinstate the portion of the Warrant and equivalent number of Warrant Shares for which such exercise was not honored (in which case such exercise shall be deemed rescinded) or deliver to the Holder the number of shares of Common Stock that would have been issued had the Company timely complied with its exercise and delivery obligations hereunder. For example, if the Holder purchases Common Stock having a total purchase price of \$11,000 to cover a Buy-In with respect to an attempted exercise of shares of Common Stock with an aggregate sale price giving rise to such purchase obligation of \$10,000, under clause (A) of the immediately preceding sentence the Company shall be required to pay the Holder \$1,000. The Holder shall provide the Company written notice indicating the amounts payable to the Holder in respect of the Buy-In and, upon request of the Company, evidence of the amount of such loss. Nothing herein shall limit a Holder's right to pursue any other remedies available to it hereunder, at law or in equity including, without limitation, a decree of specific performance and/or injunctive relief with respect to the Company's failure to timely deliver shares of Common Stock upon exercise of the Warrant as required pursuant to the terms hereof.

v. No Fractional Shares or Scrip. No fractional shares or scrip representing fractional shares shall be issued upon the exercise of this Warrant. As to any fraction of a share which the Holder would otherwise be entitled to purchase upon such exercise, the Company shall, at its election, either pay a cash adjustment in respect of such final fraction in an amount equal to such fraction multiplied by the Exercise Price or round up to the next whole share.

vi. Charges, Taxes and Expenses. Issuance of Warrant Shares shall be made without charge to the Holder for any issue or transfer tax or other incidental expense in respect of the issuance of such Warrant Shares, all of which taxes and expenses shall be paid by the Company, and such Warrant Shares shall be issued in the name of the Holder or in such name or names as may be directed by the Holder; provided, however, that, in the event that Warrant Shares are to be issued in a name other than the name of the Holder, this Warrant when surrendered for exercise shall be accompanied by the Assignment Form attached hereto duly executed by the Holder and the Company may require, as a condition thereto, the payment of a sum sufficient to reimburse it for any transfer tax incidental thereto. The Company shall pay all Transfer Agent fees required for same-day processing of any Notice of Exercise and all fees to the Depository Trust Company (or another established clearing corporation performing similar functions) required for same-day electronic delivery of the Warrant Shares.

vii. Closing of Books. The Company will not close its stockholder books or records in any manner which prevents the timely exercise of this Warrant, pursuant to the terms hereof.

e) Holder's Exercise Limitations. The Company shall not effect any exercise of this Warrant, and a Holder shall not have the right to exercise any portion of this Warrant, pursuant to Section 2 or otherwise, to the extent that after giving effect to such issuance after exercise as set forth on the applicable Notice of Exercise, the Holder (together with the Holder's Affiliates, and any other Persons acting as a group together with the Holder or any of the Holder's Affiliates (such Persons, "Attribution Parties")), would beneficially own in excess of the Beneficial Ownership Limitation (as defined below). For purposes of the foregoing sentence, the number of shares of Common Stock beneficially owned by the Holder and its Affiliates and Attribution Parties shall include the number of shares of Common Stock issuable upon exercise of this Warrant with respect to which such determination is being made, but shall exclude the number of shares of Common Stock which would be issuable upon (i) exercise of the remaining, nonexercised portion of this Warrant beneficially owned by the Holder or any of its Affiliates or Attribution Parties and (ii) exercise or conversion of the unexercised or nonconverted portion of any other securities of the Company (including, without limitation, any other Common Stock Equivalents) subject to a limitation on conversion or exercise analogous to the limitation contained herein beneficially owned by the Holder or any of its Affiliates or Attribution Parties. Except as set forth in the preceding sentence, for purposes of this Section 2(e), beneficial ownership shall be calculated in accordance with Section 13(d) of the Exchange Act and the rules and regulations promulgated thereunder, it being acknowledged by the Holder that the Company is not representing to the Holder that such calculation is in compliance with Section 13(d) of the Exchange Act and the Holder is solely responsible for any schedules required to be filed in accordance therewith. To the extent that the limitation contained in this Section 2(e) applies, the determination of whether this Warrant is exercisable (in relation to other securities owned by the Holder together with any Affiliates and Attribution Parties) and of which portion of this Warrant is exercisable shall be in the sole discretion of the Holder, and the submission of a Notice of Exercise shall be deemed to be the Holder's determination of whether this Warrant is exercisable (in relation to other securities owned by the Holder together with any Affiliates and Attribution Parties) and of which portion of this Warrant is exercisable, in each case subject to the Beneficial Ownership Limitation, and the Company shall have no obligation to verify or confirm the accuracy of such determination. In addition, a determination as to any group status as contemplated above shall be determined in accordance with Section 13(d) of the Exchange Act and the rules and regulations promulgated thereunder. For purposes of this Section 2(e), in determining the number of outstanding shares of Common Stock, a Holder may rely on the number of outstanding shares of Common Stock as reflected in (A) the Company's most recent periodic or annual report filed with the Commission, as the case may be, (B) a more recent public announcement by the Company or (C) a more recent written notice by the Company or the Transfer Agent setting forth the number of shares of Common Stock outstanding. Upon the written or oral request of a Holder, the Company shall within one Trading Day confirm orally and in writing to the Holder the number of shares of Common Stock then outstanding. In any case, the number of outstanding shares of Common Stock shall be determined after giving effect to the conversion or exercise of securities of the Company, including this Warrant, by the Holder or its Affiliates or Attribution Parties since the date as of which such number of outstanding shares of Common Stock was reported. The "Beneficial Ownership Limitation" shall be 4.99% (or, upon election by a Holder prior to the issuance of any Warrants, 9.99%) of the number of shares of the Common Stock outstanding immediately after giving effect to the issuance of shares of Common Stock issuable upon exercise of this Warrant. The Holder, upon notice to the Company, may increase or decrease the Beneficial Ownership Limitation provisions of this Section 2(e), provided that the Beneficial Ownership Limitation in no event exceeds 9.99% of the number of shares of the Common Stock outstanding immediately after giving effect to the issuance of shares of Common Stock upon exercise of this Warrant held by the Holder and the provisions of this Section 2(e) shall continue to apply. Any increase in the Beneficial Ownership Limitation will not be effective until the 61st day after such notice is delivered to the Company. The provisions of this paragraph shall be construed and implemented in a manner otherwise than in strict conformity with the terms of this Section 2(e) to correct this paragraph (or any portion hereof) which may be defective or inconsistent with the intended Beneficial Ownership Limitation herein contained or to make changes or supplements necessary or desirable to properly give effect to such limitation. The limitations contained in this paragraph shall apply to a successor holder of this Warrant.

Section 3. Certain Adjustments.

a) Stock Dividends and Splits. If the Company, at any time while this Warrant is outstanding: (i) pays a stock dividend or otherwise makes a distribution or distributions on shares of its Common Stock or any other equity or equity equivalent securities payable in shares of Common Stock (which, for avoidance of doubt, shall not include any shares of Common Stock issued by the Company upon exercise of this Warrant), (ii) subdivides outstanding shares of Common Stock into a larger number of shares, (iii) combines (including by way of reverse stock split) outstanding shares of Common Stock into a smaller number of shares, or (iv) issues by reclassification of shares of the Common Stock any shares of capital stock of the Company, then in each case the Exercise Price shall be multiplied by a fraction of which the numerator shall be the number of shares of Common Stock (excluding treasury shares, if any) outstanding immediately before such event and of which the denominator shall be the number of shares of Common Stock outstanding immediately after such event, and the number of shares issuable upon exercise of this Warrant shall be proportionately adjusted such that the aggregate Exercise Price of this Warrant shall remain unchanged. Any adjustment made pursuant to this Section 3(a) shall become effective immediately after the record date for the determination of stockholders entitled to receive such dividend or distribution and shall become effective immediately after the effective date in the case of a subdivision, combination or re-classification.

b) Reserved.

c) Subsequent Rights Offerings. In addition to any adjustments pursuant to Section 3(a) above, if at any time the Company grants, issues or sells any Common Stock Equivalents or rights to purchase stock, warrants, securities or other property pro rata to the record holders of any class of shares of Common Stock (the "Purchase Rights"), then the Holder will be entitled to acquire, upon the terms applicable to such Purchase Rights, the aggregate Purchase Rights which the Holder could have acquired if the Holder had held the number of shares of Common Stock acquirable upon complete exercise of this Warrant (without regard to any limitations on exercise hereof, including without limitation, the Beneficial Ownership Limitation) immediately before the date on which a record is taken for the grant, issuance or sale of such Purchase Rights, or, if no such record is taken, the date as of which the record holders of shares of Common Stock are to be determined for the grant, issue or sale of such Purchase Rights (provided, however, that, to the extent that the Holder's right to participate in any such Purchase Right would result in the Holder exceeding the Beneficial Ownership Limitation, then the Holder shall not be entitled to participate in such Purchase Right to such extent (or beneficial ownership of such shares of Common Stock as a result of such Purchase Right to such extent) and such Purchase Right to such extent shall be held in abeyance for the Holder until such time, if ever, as its right thereto would not result in the Holder exceeding the Beneficial Ownership Limitation).

d) Pro Rata Distributions. During such time as this Warrant is outstanding, if the Company shall declare or make any dividend or other distribution of its assets (or rights to acquire its assets) to holders of shares of Common Stock, by way of return of capital or otherwise (including, without limitation, any distribution of cash, stock or other securities, property or options by way of a dividend, spin off, reclassification, corporate rearrangement, scheme of arrangement or other similar transaction) (a "Distribution"), at any time after the issuance of this Warrant, then, in each such case, the Holder shall be entitled to participate in such Distribution to the same extent that the Holder would have participated therein if the Holder had held the number of shares of Common Stock acquirable upon complete exercise of this Warrant (without regard to any limitations on exercise hereof, including without limitation, the Beneficial Ownership Limitation) immediately before the date of which a record is taken for such Distribution, or, if no such record is taken, the date as of which the record holders of shares of Common Stock are to be determined for the participation in such Distribution (provided, however, that, to the extent that the Holder's right to participate in any such Distribution would result in the Holder exceeding the Beneficial Ownership Limitation, then the Holder shall not be entitled to participate in such Distribution to such extent (or in the beneficial ownership of any shares of Common Stock as a result of such Distribution to such extent) and the portion of such Distribution shall be held in abeyance for the benefit of the Holder until such time, if ever, as its right thereto would not result in the Holder exceeding the Beneficial Ownership Limitation).

e) Fundamental Transaction. If, at any time while this Warrant is outstanding, (i) the Company, directly or indirectly, in one or more related transactions effects any merger or consolidation of the Company with or into another Person, (ii) the Company or any Subsidiary, directly or indirectly, effects any sale, lease, license, assignment, transfer, conveyance or other disposition of all or substantially all of its assets in one or a series of related transactions, (iii) any, direct or indirect, purchase offer, tender offer or exchange offer (whether by the Company or another Person) is completed pursuant to which holders of Common Stock are permitted to sell, tender or exchange their shares for other securities, cash or property and has been accepted by the holders of 50% or more of the outstanding Common Stock or 50% or more of the voting power of the common equity of the Company, (iv) the Company, directly or indirectly, in one or more related transactions effects any reclassification, reorganization or recapitalization of the Common Stock or any compulsory share exchange pursuant to which the Common Stock is effectively converted into or exchanged for other securities, cash or property, or (v) the Company, directly or indirectly, in one or more related transactions consummates a stock or share purchase agreement or other business combination (including, without limitation, a reorganization, recapitalization, spin-off, merger or scheme of arrangement) with another Person or group of Persons whereby such other Person or group acquires 50% or more of the outstanding shares of Common Stock or 50% or more of the voting power of the common equity of the Company (each a "Fundamental Transaction"), then, upon any subsequent exercise of this Warrant, the Holder shall have the right to receive, for each Warrant Share that would have been issuable upon such exercise immediately prior to the occurrence of such Fundamental Transaction, at the option of the Holder (without regard to any limitation in Section 2(e) on the exercise of this Warrant), the number of shares of Common Stock of the successor or acquiring corporation or of the Company, if it is the surviving corporation, and any additional consideration (the "Alternate Consideration") receivable as a result of such Fundamental Transaction by a holder of the number of shares of Common Stock for which this Warrant is exercisable immediately prior to such Fundamental Transaction (without regard to any limitation in Section 2(e) on the exercise of this Warrant). For purposes of any such exercise, the determination of the Exercise Price shall be appropriately adjusted to apply to such Alternate Consideration based on the amount of Alternate Consideration issuable in respect of one share of Common Stock in such Fundamental Transaction, and the Company shall apportion the Exercise Price among the Alternate Consideration in a reasonable manner reflecting the relative value of any different components of the Alternate Consideration. If holders of Common Stock are given any 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 Alternate Consideration it receives upon any exercise of this Warrant following such Fundamental Transaction. Notwithstanding anything to the contrary, in the event of a Fundamental Transaction, the Company or any Successor Entity (as defined below) shall, at the Holder's option, exercisable at any time concurrently with, or within 30 days after, the consummation of the Fundamental Transaction (or, if later, the date of the public announcement of the applicable Fundamental Transaction), purchase this Warrant from the Holder by paying to the Holder an amount of cash equal to the Black Scholes Value (as defined below) of the remaining unexercised portion of this Warrant on the date of the consummation of such Fundamental Transaction; provided, however, that, if the Fundamental Transaction is not within the Company's control, including not approved by the Company's Board of Directors, Holder shall only be entitled to receive from the Company or any Successor Entity the same type or form of consideration (and in the same proportion), at the Black Scholes Value of the unexercised portion of this Warrant, that is being offered and paid to the holders of Common Stock of the Company in connection with the Fundamental Transaction, whether that consideration be in the form of cash, stock or any combination thereof, or whether the holders of Common Stock are given the choice to receive from among alternative forms of consideration in connection with the Fundamental Transaction; provided, further, that if holders of Common Stock of the Company are not offered or paid any consideration in such Fundamental Transaction, such holders of Common Stock will be deemed to have received common stock of the Successor Entity (which Entity may be the Company following such Fundamental Transaction) in such Fundamental Transaction. "Black Scholes Value" means the value of this Warrant based on the Black-Scholes Option Pricing Model obtained from the "OV" function on Bloomberg, L.P. ("Bloomberg") determined as of the day of consummation of the applicable contemplated Fundamental Transaction for pricing purposes and reflecting (A) a risk-free interest rate corresponding to the U.S. Treasury rate for a period equal to the time between the date of the public announcement of the applicable Fundamental Transaction and the Termination Date, (B) an expected volatility equal to the greater of 100% and the 100 day volatility obtained from the HVT function on Bloomberg (determined utilizing a 365 day annualization factor) as of the Trading Day immediately following the public announcement of the applicable contemplated Fundamental Transaction, (C) the underlying price per share used in such calculation shall be the greater of (i) the sum of the price per share being offered in cash, if any, plus the value of any non-cash consideration, if any, being offered in such Fundamental Transaction and (ii) the highest VWAP during the period beginning on the Trading Day immediately preceding the public announcement of the applicable contemplated Fundamental Transaction (or the consummation of the applicable Fundamental Transaction, if earlier) and ending on the Trading Day of the Holder's request pursuant to this Section 3(e) and (D) a remaining option time equal to the time between the date of the public announcement of the applicable contemplated Fundamental Transaction and the Termination Date [and (E) a zero cost of borrow. The payment of the Black Scholes Value will be made by wire transfer of immediately available funds (or such other consideration) within five Business Days of the Holder's election (or, if later, on the date of consummation of the Fundamental Transaction). The Company shall cause any successor entity in a Fundamental Transaction in which the Company is not the survivor (the "Successor Entity") to assume in writing all of the obligations of the Company under this Warrant in accordance with the provisions of this Section 3(e) pursuant to written agreements in form and substance reasonably satisfactory to the Holder and approved by the Holder (without unreasonable delay) prior to such Fundamental Transaction and shall, at the option of the Holder, deliver to the Holder in exchange for this Warrant a security of the Successor Entity evidenced by a written instrument substantially similar in form and substance to this Warrant which is exercisable for a corresponding number of shares of capital stock of such Successor Entity (or its parent entity) equivalent to the shares of Common Stock acquirable and receivable upon exercise of this Warrant (without regard to any limitations on the exercise of this Warrant) prior to such Fundamental Transaction, and with an exercise price which applies the exercise price hereunder to such shares of capital stock (but taking into account the relative value of the shares of Common Stock pursuant to such Fundamental Transaction and the value of such shares of capital stock, such number of shares of capital stock and such exercise price being for the purpose of protecting the economic value of this Warrant immediately prior to the consummation of such Fundamental Transaction), and which is reasonably satisfactory in form and substance to the Holder. Upon the occurrence of any such Fundamental Transaction, the Successor Entity shall be added to the term "Company" under this Warrant (so that from and after the occurrence or consummation of such Fundamental Transaction, each and every provision of this Warrant and the other Transaction Documents referring to the "Company" shall refer instead to each of the Company and the Successor Entity or Successor Entities, jointly and severally), and the Successor Entity or Successor Entities, jointly and severally with the Company, may exercise every right and power of the Company prior thereto and the Successor Entity or Successor Entities shall assume all of the obligations of the Company prior thereto under this Warrant and the other Transaction Documents with the same effect as if the Company and such

Successor Entity or Successor Entities, jointly and severally, had been named as the Company herein. For the avoidance of doubt, the Holder shall be entitled to the benefits of the provisions of this Section 3(e) regardless of (i) whether the Company has sufficient authorized shares of Common Stock for the issuance of Warrant Shares and/or (ii) whether a Fundamental Transaction occurs prior to the Initial Exercise Date.

f) Calculations. All calculations under this Section 3 shall be made to the nearest cent or the nearest 1/100th of a share, as the case may be. For purposes of this Section 3, the number of shares of Common Stock deemed to be issued and outstanding as of a given date shall be the sum of the number of shares of Common Stock (excluding treasury shares, if any) issued and outstanding.

g) Notice to Holder.

i. Adjustment to Exercise Price. Whenever the Exercise Price is adjusted pursuant to any provision of this Section 3, the Company shall promptly deliver to the Holder by email a notice setting forth the Exercise Price after such adjustment and any resulting adjustment to the number of Warrant Shares and setting forth a brief statement of the facts requiring such adjustment.

ii. Notice to Allow Exercise by Holder. If (A) the Company shall declare a dividend (or any other distribution in whatever form) on the Common Stock, (B) the Company shall declare a special nonrecurring cash dividend on or a redemption of the Common Stock, (C) the Company shall authorize the granting to all holders of the Common Stock rights or warrants to subscribe for or purchase any shares of capital stock of any class or of any rights, (D) the approval of any stockholders of the Company shall be required in connection with any reclassification of the Common Stock, any consolidation or merger to which the Company (or any of its Subsidiaries) is a party, any sale or transfer of all or substantially all of its assets, or any compulsory share exchange whereby the Common Stock is converted into other securities, cash or property, or (E) the Company shall authorize the voluntary or involuntary dissolution, liquidation or winding up of the affairs of the Company, then, in each case, the Company shall cause to be delivered by email to the Holder at its last email address as it shall appear upon the Warrant Register of the Company, at least 20 calendar days prior to the applicable record or effective date hereinafter specified, a notice stating (x) the date on which a record is to be taken for the purpose of such dividend, distribution, redemption, rights or warrants, or if a record is not to be taken, the date as of which the holders of the Common Stock of record to be entitled to such dividend, distributions, redemption, rights or warrants are to be determined or (y) the date on which such reclassification, consolidation, merger, sale, transfer or share exchange is expected to become effective or close, and the date as of which it is expected that holders of the Common Stock of record shall be entitled to exchange their shares of the Common Stock for securities, cash or other property deliverable upon such reclassification, consolidation, merger, sale, transfer or share exchange; provided that the failure to deliver such notice or any defect therein or in the delivery thereof shall not affect the validity of the corporate action required to be specified in such notice. To the extent that any notice provided in this Warrant constitutes, or contains, material, non-public information regarding the Company or any of the Subsidiaries, the Company shall simultaneously file such notice with the Commission pursuant to a Current Report on Form 8-K. The Holder shall remain entitled to exercise this Warrant during the period commencing on the date of such notice to the effective date of the event triggering such notice except as may otherwise be expressly set forth herein.

h) Voluntary Adjustment By Company. Subject to the rules and regulations of the Trading Market, the Company may at any time during the term of this Warrant, subject to the prior written consent of the Holder, reduce the then current Exercise Price to any amount and for any period of time deemed appropriate by the board of directors of the Company.

Section 4. Transfer of Warrant.

a) Transferability. This Warrant and all rights hereunder (including, without limitation, any registration rights) are transferable, in whole or in part, upon surrender of this Warrant at the principal office of the Company or its designated agent, together with a written assignment of this Warrant substantially in the form attached hereto duly executed by the Holder or its agent or attorney and funds sufficient to pay any transfer taxes payable upon the making of such transfer. Upon such surrender and, if required, such payment, the Company shall execute and deliver a new Warrant or Warrants in the name of the assignee or assignees, as applicable, and in the denomination or denominations specified in such instrument of assignment, and shall issue to the assignor a new Warrant evidencing the portion of this Warrant not so assigned, and this Warrant shall promptly be cancelled. Notwithstanding anything herein to the contrary, the Holder shall not be required to physically surrender this Warrant to the Company unless the Holder has assigned this Warrant in full, in which case, the Holder shall surrender this Warrant to the Company within three (3) Trading Days of the date on which the Holder delivers an assignment form to the Company assigning this Warrant in full. The Warrant, if properly assigned in accordance herewith, may be exercised by a new holder for the purchase of Warrant Shares without having a new Warrant issued.

b) New Warrants. If this Warrant is not held in global form through DTC (or any successor depository), this Warrant may be divided or combined with other Warrants upon presentation hereof at the aforesaid office of the Company, together with a written notice specifying the names and denominations in which new Warrants are to be issued, signed by the Holder or its agent or attorney. Subject to compliance with Section 4(a), as to any transfer which may be involved in such division or combination, the Company shall execute and deliver a new Warrant or Warrants in exchange for the Warrant or Warrants to be divided or combined in accordance with such notice. All Warrants issued on transfers or exchanges shall be dated the initial issuance date of this Warrant and shall be identical with this Warrant except as to the number of Warrant Shares issuable pursuant thereto.

c) Warrant Register. The Warrant Agent shall register this Warrant, upon records to be maintained by the Warrant Agent for that purpose (the “Warrant Register”), in the name of the record Holder hereof from time to time. The Company and the Warrant Agent may deem and treat the registered Holder of this Warrant as the absolute owner hereof for the purpose of any exercise hereof or any distribution to the Holder, and for all other purposes, absent actual notice to the contrary.

Section 5. Miscellaneous.

a) No Rights as Stockholder Until Exercise; No Settlement in Cash. This Warrant does not entitle the Holder to any voting rights, dividends or other rights as a stockholder of the Company prior to the exercise hereof as set forth in Section 2(d)(i), except as expressly set forth in Section 3. Without limiting any rights of a Holder to receive Warrant Shares on a “cashless exercise” pursuant to Section 2(c) or to receive cash payments pursuant to Section 2(d)(i) and Section 2(d)(iv) herein, in no event shall the Company be required to net cash settle an exercise of this Warrant.

b) Loss, Theft, Destruction or Mutilation of Warrant. The Company covenants that upon receipt by the Company of evidence reasonably satisfactory to it of the loss, theft, destruction or mutilation of this Warrant or any stock certificate relating to the Warrant Shares, and in case of loss, theft or destruction, of indemnity or security reasonably satisfactory to it (which, in the case of the Warrant, shall not include the posting of any bond), and upon surrender and cancellation of such Warrant or stock certificate, if mutilated, the Company will make and deliver a new Warrant or stock certificate of like tenor and dated as of such cancellation, in lieu of such Warrant or stock certificate.

c) Saturdays, Sundays, Holidays, etc. If the last or appointed day for the taking of any action or the expiration of any right required or granted herein shall not be a Business Day, then such action may be taken or such right may be exercised on the next succeeding Business Day.

d) Authorized Shares.

The Company covenants that, during the period the Warrant is outstanding, it will reserve from its authorized and unissued Common Stock a sufficient number of shares to provide for the issuance of the Warrant Shares upon the exercise of any purchase rights under this Warrant. The Company further covenants that its issuance of this Warrant shall constitute full authority to its officers who are charged with the duty of issuing the necessary Warrant Shares upon the exercise of the purchase rights under this Warrant. The Company will take all such reasonable action as may be necessary to assure that such Warrant Shares may be issued as provided herein without violation of any applicable law or regulation, or of any requirements of the Trading Market upon which the Common Stock may be listed. The Company covenants that all Warrant Shares which may be issued upon the exercise of the purchase rights represented by this Warrant will, upon exercise of the purchase rights represented by this Warrant and payment for such Warrant Shares in accordance herewith, be duly authorized, validly issued, fully paid and nonassessable and free from all taxes, liens and charges created by the Company in respect of the issue thereof (other than taxes in respect of any transfer occurring contemporaneously with such issue).

Except and to the extent as waived or consented to by the Holder, the Company shall not by any action, including, without limitation, amending its certificate of incorporation or through any reorganization, transfer of assets, consolidation, merger, dissolution, issue or sale of securities or any other voluntary action, avoid or seek to avoid the observance or performance of any of the terms of this Warrant, but will at all times in good faith assist in the carrying out of all such terms and in the taking of all such actions as may be necessary or appropriate to protect the rights of Holder as set forth in this Warrant against impairment. Without limiting the generality of the foregoing, the Company will (i) not increase the par value of any Warrant Shares above the amount payable therefor upon such exercise immediately prior to such increase in par value, (ii) take all such action as may be necessary or appropriate in order that the Company may validly and legally issue fully paid and nonassessable Warrant Shares upon the exercise of this Warrant and (iii) use commercially reasonable efforts to obtain all such authorizations, exemptions or consents from any public regulatory body having jurisdiction thereof, as may be, necessary to enable the Company to perform its obligations under this Warrant.

Before taking any action which would result in an adjustment in the number of Warrant Shares for which this Warrant is exercisable or in the Exercise Price, the Company shall obtain all such authorizations or exemptions thereof, or consents thereto, as may be necessary from any public regulatory body or bodies having jurisdiction thereof.

e) Governing Law. All questions concerning the construction, validity, enforcement and interpretation of this Warrant shall be governed by and construed and enforced in accordance with the internal laws of the State of New York, without regard to the principles of conflicts of law thereof. Each party agrees that all legal proceedings concerning the interpretations, enforcement and defense of the transactions contemplated by this Warrant (whether brought against a party hereto or their respective affiliates, directors, officers, shareholders, partners, members, employees or agents) shall be commenced exclusively in the state and federal courts sitting in the City of New York. Each party hereby irrevocably submits to the exclusive jurisdiction of the state and federal courts sitting in the City of New York, Borough of Manhattan for the adjudication of any dispute hereunder or in connection herewith or with any transaction contemplated hereby or discussed herein, and hereby irrevocably waives, and agrees not to assert in any suit, action or proceeding, any claim that it is not personally subject to the jurisdiction of any such court, that such suit, action or proceeding is improper or is an inconvenient venue for such proceeding. Each party hereby irrevocably waives personal service of process and consents to process being served in any such suit, action or proceeding by mailing a copy thereof via registered or certified mail or overnight delivery (with evidence of delivery) to such party at the address in effect for notices to it under this Warrant and agrees that such service shall constitute good and sufficient service of process and notice thereof. Nothing contained herein shall be deemed to limit in any way any right to serve process in any other manner permitted by law. If either party shall commence an action, suit or proceeding to enforce any provisions of this Warrant, the prevailing party in such action, suit or proceeding shall be reimbursed by the other party for their reasonable attorneys' fees and other costs and expenses incurred with the investigation, preparation and prosecution of such action or proceeding. **Notwithstanding the foregoing, this exclusive forum provision shall not apply to suits brought to enforce a duty or liability created by the Exchange Act, any other claim for which the federal courts have exclusive jurisdiction or any complaint asserting a cause of action arising under the Securities Act against us or any of our directors, officers, other employees or agents. Section 27 of the Exchange Act creates exclusive federal jurisdiction over all suits brought to enforce any duty or liability created by the Exchange Act or the rules and regulations thereunder.**

f) Restrictions. The Holder acknowledges that the Warrant Shares acquired upon the exercise of this Warrant, if not registered, and the Holder does not utilize cashless exercise, will have restrictions upon resale imposed by state and federal securities laws.

g) Nonwaiver and Expenses. No course of dealing or any delay or failure to exercise any right hereunder on the part of Holder shall operate as a waiver of such right or otherwise prejudice the Holder's rights, powers or remedies. Without limiting any other provision of this Warrant, if the Company willfully and knowingly fails to comply with any provision of this Warrant, which results in any material damages to the Holder, the Company shall pay to the Holder such amounts as shall be sufficient to cover any costs and expenses including, but not limited to, reasonable attorneys' fees, including those of appellate proceedings, incurred by the Holder in collecting any amounts due pursuant hereto or in otherwise enforcing any of its rights, powers or remedies hereunder.

h) Notices. Any and all notices or other communications or deliveries to be provided by the Holders hereunder including, without limitation, any Notice of Exercise, shall be in writing and delivered personally, by e-mail, or sent by a nationally recognized overnight courier service, addressed to the Company, at 2 Burlington Woods Drive, Suite 100, Burlington, MA 01803 Attention: Mr. Jeffrey Frelick, Chief Executive Officer, email address: ###, or such other email address or address as the Company may specify for such purposes by notice to the Holders. Any and all notices or other communications or deliveries to be provided by the Company hereunder shall be in writing and delivered personally, by e-mail, or sent by a nationally recognized overnight courier service addressed to each Holder at the e-mail address or address of such Holder appearing on the books of the Company. Any notice or other communication or deliveries hereunder shall be deemed given and effective on the earliest of (i) the time of transmission, if such notice or communication is delivered via e-mail at the e-mail address set forth in this Section prior to 5:30 p.m. (New York City time) on any date, (ii) the next Trading Day after the time of transmission, if such notice or communication is delivered via e-mail at the e-mail address set forth in this Section on a day that is not a Trading Day or later than 5:30 p.m. (New York City time) on any Trading Day, (iii) the second Trading Day following the date of mailing, if sent by U.S. nationally recognized overnight courier service, or (iv) upon actual receipt by the party to whom such notice is required to be given. To the extent that any notice provided hereunder constitutes, or contains, material, non-public information regarding the Company or any Subsidiaries, the Company shall simultaneously file such notice with the Commission pursuant to a Current Report on Form 8-K.

i) Limitation of Liability. No provision hereof, in the absence of any affirmative action by the Holder to exercise this Warrant to purchase Warrant Shares, and no enumeration herein of the rights or privileges of the Holder, shall give rise to any liability of the Holder for the purchase price of any Common Stock or as a stockholder of the Company, whether such liability is asserted by the Company or by creditors of the Company.

j) Remedies. The Holder, in addition to being entitled to exercise all rights granted by law, including recovery of damages, will be entitled to specific performance of its rights under this Warrant. The Company agrees that monetary damages would not be adequate compensation for any loss incurred by reason of a breach by it of the provisions of this Warrant and hereby agrees to waive and not to assert the defense in any action for specific performance that a remedy at law would be adequate.

k) Successors and Assigns. Subject to applicable securities laws, this Warrant and the rights and obligations evidenced hereby shall inure to the benefit of and be binding upon the successors and permitted assigns of the Company and the successors and permitted assigns of Holder. The provisions of this Warrant are intended to be for the benefit of any Holder from time to time of this Warrant and shall be enforceable by the Holder or holder of Warrant Shares.

l) Amendment. This Warrant may be modified or amended or the provisions hereof waived with the written consent of the Company, on the one hand, and the Holder of the beneficial owner of this Warrant, on the other hand.

m) Severability. Wherever possible, each provision of this Warrant shall be interpreted in such manner as to be effective and valid under applicable law, but if any provision of this Warrant shall be prohibited by or invalid under applicable law, such provision shall be ineffective to the extent of such prohibition or invalidity, without invalidating the remainder of such provisions or the remaining provisions of this Warrant.

n) Headings. The headings used in this Warrant are for the convenience of reference only and shall not, for any purpose, be deemed a part of this Warrant.

o) Warrant Agency Agreement. If this Warrant is held in global form through DTC (or any successor depositary), this Warrant is issued subject to the Warrant Agency Agreement. To the extent any provision of this Warrant conflicts with the express provisions of the Warrant Agency Agreement, the provisions of this Warrant shall govern and be controlling.

(Signature Page Follows)

IN WITNESS WHEREOF, the Company has caused this Warrant to be executed by its officer thereunto duly authorized as of the date first above indicated.

BONE BIOLOGICS CORPORATION

By: _____
Name: Jeffrey Frelick
Title: Chief Executive Officer

NOTICE OF EXERCISE

TO: BONE BIOLOGICS CORPORATION

(1) The undersigned hereby elects to purchase _____ Warrant Shares of the Company pursuant to the terms of the attached Warrant (only if exercised in full), and tenders herewith payment of the exercise price in full, together with all applicable transfer taxes, if any.

(2) Payment shall take the form of (check applicable box):

- ☐ in lawful money of the United States; or
- ☐ if permitted the cancellation of such number of Warrant Shares as is necessary, in accordance with the formula set forth in subsection 2(c), to exercise this Warrant with respect to the maximum number of Warrant Shares purchasable pursuant to the cashless exercise procedure set forth in subsection 2(c).

(3) Please register and issue said Warrant Shares in the name of the undersigned or in such other name as is specified below:

The Warrant Shares shall be delivered to the following DWAC Account Number or by physical delivery of a certificate to:

[SIGNATURE OF HOLDER]

Name of Investing Entity:

Signature of Authorized Signatory of Investing Entity:

Name of Authorized Signatory:

Title of Authorized Signatory:

Date:

ASSIGNMENT FORM

(To assign the foregoing Warrant, execute this form and supply required information. Do not use this form to exercise the Warrant.)

FOR VALUE RECEIVED, [] all of or [] shares of the foregoing Warrant and all rights evidenced thereby are hereby assigned to

Name: (Please Print)

Address: (Please Print)

Phone Number:

Email Address:

Dated: _____, _____

Holder’s Signature: _____

Holder’s Address: _____

NOTE: The signature to this Assignment Form must correspond with the name as it appears on the face of the Warrant, without alteration or enlargement or any change whatsoever. Officers of corporations and those acting in a fiduciary or other representative capacity should file proper evidence of authority to assign the foregoing Warrant.

FORM OF INDEMNIFICATION AGREEMENT

This Indemnification Agreement, dated _____, is made between Bone Biologics, Corporation, a Delaware corporation (the “Company”), and _____ (the “Indemnitee”).

RECITALS

A. The Company desires to attract and retain the services of talented and experienced individuals, such as Indemnitee, to serve as directors and officers of the Company and its subsidiaries and wishes to indemnify its directors and officers to the maximum extent permitted by law;

B. The Company and Indemnitee recognize that corporate litigation in general has subjected directors and officers to expensive litigation risks;

C. Section 145 of the General Corporation Law of Delaware, under which the Company is organized (“Section 145”), empowers the Company to indemnify its directors and officers by agreement and to indemnify persons who serve, at the request of the Company, as the directors and officers of other corporations or enterprises, and expressly provides that the indemnification provided by Section 145 is not exclusive;

D. The Company’s Amended and Restated Articles of Incorporation, as amended, expressly provide that the indemnification provisions set forth therein, which include mandatory advancement, are not exclusive and may be supplemented by contracts such as this Indemnification Agreement;

E. The Company’s Bylaws expressly provide that the indemnification provisions set forth therein, which include mandatory advancement, are not exclusive and may be supplemented by contracts such as this Indemnification Agreement;

F. Section 145(g) allows for the purchase of management liability (“D&O”) insurance by the Company, which in theory can cover asserted liabilities without regard to whether they are indemnifiable or not;

G. Individuals considering service with or presently serving the Company expect to be extended market terms of indemnification commensurate with their position, and that entities such as Company will endeavor to maintain appropriate D&O insurance; and

H. In order to induce Indemnitee to serve or continue to serve as a director or officer of the Company and/or one or more subsidiaries of the Company, the Company and Indemnitee enter into this Agreement, which is a material consideration for Indemnitee’s service.

AGREEMENT

NOW, THEREFORE, Indemnitee and the Company hereby agree as follows:

1. Definitions. As used in this Agreement:

(a) “Agent” means any person who is or was a director, officer, employee or other agent of the Company or a subsidiary of the Company; or is or was serving at the request of, for the convenience of, or to represent the interests of the Company or a subsidiary of the Company as a director, officer, employee or agent of another foreign or domestic corporation, limited liability company, employee benefit plan, nonprofit entity, partnership, joint venture, trust or other enterprise; or was a director, officer, employee or agent of a foreign or domestic corporation which was a predecessor corporation of the Company or a subsidiary of the Company, or was a director, officer, employee or agent of another enterprise at the request of, for the convenience of, or to represent the interests of such predecessor corporation.

(b) “Board” means the Board of Directors of the Company.

(c) A “Change in Control” shall be deemed to have occurred if (i) any “person,” as such term is used in Sections 13(d) and 14(d) of the Securities Exchange Act of 1934, as amended (the “Exchange Act”), other than a trustee or other fiduciary holding securities under an employee benefit plan of the Company or a corporation owned directly or indirectly by the stockholders of the Company in substantially the same proportions as their ownership of stock of the Company, is or becomes the “beneficial owner” (as defined in Rule 13d-3 under the Exchange Act), directly or indirectly, of securities of the Company representing a majority of the total voting power represented by the Company’s then outstanding voting securities, (ii) during any period of two consecutive years, individuals who at the beginning of such period constituted the Board, together with any new directors whose election by the Board or nomination for election by the Company’s stockholders was approved by a vote of at least two-thirds of the directors then still in office who either were directors at the beginning of the period or whose election or nomination was previously so approved, cease for any reason to constitute a majority of the Board, (iii) the stockholders of the Company approve a merger or consolidation or a sale of all or substantially all of the Company’s assets with or to another entity, other than a merger, consolidation or asset sale that would result in the holders of the Company’s outstanding voting securities immediately prior thereto continuing to represent (either by remaining outstanding or by being converted into voting securities of the surviving entity) at least a majority of the total voting power represented by the voting securities of the Company or such surviving or successor entity outstanding immediately thereafter, or (iv) the stockholders of the Company approve a plan of complete liquidation of the Company.

(d) “Expenses” shall include all reasonable out-of-pocket costs of any type or nature whatsoever (including, without limitation, all attorneys’ fees and related disbursements), actually and reasonably incurred by Indemnatee in connection with either the investigation, defense or appeal of a Proceeding or establishing or enforcing a right to indemnification under this Agreement, or Section 145 or otherwise; provided, however, that “Expenses” shall not include any judgments, fines, ERISA excise taxes or penalties, or amounts paid in settlement of a Proceeding.

(e) “Independent Counsel” means a law firm, or a partner (or, if applicable, member) of such a law firm, that is experienced in relevant matters of corporation law and neither currently is, nor in the past five years has been, retained to represent: (i) the Company or Indemnatee in any matter material to either such party or (ii) any other party to or witness in the proceeding giving rise to a claim for indemnification hereunder. Notwithstanding the foregoing, the term “Independent Counsel” shall not include any person who, under the applicable standards of professional conduct then prevailing, would have a conflict of interest in representing either the Company or Indemnatee in an action to determine Indemnatee’s rights under this Agreement. Where required by this Agreement, Independent Counsel shall be retained at the Company’s sole expense.

(f) “Proceeding” means any threatened, pending, or completed action, claim, suit, arbitration, alternate dispute resolution mechanism, investigation, administrative hearing or any other proceeding whether formal or informal, civil, criminal, administrative, or investigative, including any such investigation or proceeding instituted by or on behalf of the Corporation or its Board of Directors, in which Indemnatee is or reasonably may be involved as a party or target, that is by reason of Indemnatee’s being an Agent of the Corporation.

(g) “Subsidiary” means any corporation of which more than 50% of the outstanding voting securities is owned directly or indirectly by the Company, by the Company and one or more other subsidiaries, or by one or more other subsidiaries.

2. Agreement to Serve. Indemnatee agrees to serve and/or continue to serve as an Agent of the Company, at its will (or under separate agreement, if such agreement exists), in the capacity Indemnatee currently serves as an Agent of the Company, so long as Indemnatee is duly appointed or elected and qualified in accordance with the applicable provisions of the Bylaws or charter of the Company or any subsidiary of the Company or until such time as Indemnatee tenders his or her resignation in writing; provided, however, that nothing contained in this Agreement is intended to create any right to continued employment or other service by Indemnatee.

3. Liability Insurance.

(a) Maintenance of D&O Insurance. The Company hereby covenants and agrees that, so long as Indemnatee shall continue to serve as an Agent of the Company and thereafter so long as Indemnatee shall be subject to any possible Proceeding by reason of the fact that Indemnatee was an Agent of the Company, the Company, subject to Section 3(c), shall promptly obtain and maintain in full force and effect directors’ and officers’ liability insurance (“D&O Insurance”) in reasonable amounts from established and reputable insurers of a minimum A.M. Best rating of A- VII, and as more fully described below. In the event of a Change in Control, the Company shall, as set forth in Section (c) below, either: i) maintain such D&O Insurance for six years; or ii) purchase a six year tail for such D&O Insurance. Should a tail policy be purchased, reasonable efforts shall be made to try to negotiate that such policy is purchased by the Company’s D&O insurance broker at that time, and under the same or better terms and limits for individuals that is in place at that time.

(b) Rights and Benefits. In all policies of D&O Insurance, Indemnatee shall qualify as an insured in such a manner as to provide Indemnatee the same rights and benefits as are accorded to the most favorably insured of the Company’s independent directors (as defined by the insurer) if Indemnatee is such an independent director; of the Company’s non-independent directors if Indemnatee is not an independent director; of the Company’s officers if Indemnatee is an officer of the Company; or of the Company’s key employees, if Indemnatee is not a director or officer but is a key employee.

(c) Limitation on Required Maintenance of D&O Insurance. Notwithstanding the foregoing, the Company shall have no obligation to obtain or maintain D&O Insurance at all, or of any type, terms, or amount, if the Company determines in good faith and after using commercially reasonable efforts that: such insurance is not reasonably available; the premium costs for such insurance are disproportionate to the amount of coverage provided; the coverage provided by such insurance is limited so as to provide an insufficient or unreasonable benefit; Indemnatee is covered by similar insurance maintained by a subsidiary of the Company; or the Company is to be acquired and a policy (tail or otherwise) of reasonable terms and duration can be purchased for pre-closing acts or omissions by Indemnatee.

4. Mandatory Indemnification. Subject to the terms of this Agreement:

(a) Third Party Actions. If Indemnatee was or is a party or is threatened to be made a party to any Proceeding (other than an action by or in the right of the Company) by reason of the fact that Indemnatee is or was an Agent of the Company, or by reason of anything done or not done by Indemnatee in any such capacity, the Company shall indemnify Indemnatee against all Expenses and liabilities of any type whatsoever (including, but not limited to, judgments, fines, ERISA excise taxes and penalties, and amounts paid in settlement) actually and reasonably incurred by Indemnatee in connection with the investigation, defense, settlement or appeal of such Proceeding, provided Indemnatee acted in good faith and in a manner Indemnatee reasonably believed to be in or not opposed to the best interests of the Company, and, with respect to any criminal action or Proceeding, had no reasonable cause to believe his or her conduct was unlawful.

(b) Derivative Actions. If Indemnatee was or is a party or is threatened to be made a party to any Proceeding by or in the right of the Company by reason of the fact that Indemnatee is or was an Agent of the Company, or by reason of anything done or not done by Indemnatee in any such capacity, the Company shall indemnify Indemnatee against all Expenses actually and reasonably incurred by Indemnatee in connection with the investigation, defense, settlement or appeal of such Proceeding, provided Indemnatee acted in good faith and in a manner Indemnatee reasonably believed to be in or not opposed to the best interests of the Company; except that no indemnification under this Section 4(b) shall be made in respect to any claim, issue or matter as to which Indemnatee shall have been finally adjudged to be liable to the Company by a court of competent jurisdiction unless and only to the extent that the Delaware Court of Chancery or the court in which such Proceeding was brought shall determine upon application that, despite the adjudication of liability but in view of all the circumstances of the case, Indemnatee is fairly and reasonably entitled to indemnity for such amounts which the Delaware Court of Chancery or such other court shall deem proper.

(c) Actions where Indemnatee is Deceased. If Indemnatee is a person who was or is a party or is threatened to be made a party to any Proceeding by reason of the fact that Indemnatee is or was an Agent of the Company, or by reason of anything done or not done by Indemnatee in any such capacity, and if, prior to, during the pendency of or after completion of such Proceeding Indemnatee is deceased, the Company shall indemnify Indemnatee's heirs, executors and administrators against all Expenses and liabilities of any type whatsoever to the extent Indemnatee would have been entitled to indemnification pursuant to this Agreement were Indemnatee still alive.

(d) Certain Terminations. The termination of any Proceeding or of any claim, issue, or matter therein by judgment, order, settlement, or conviction, or upon a plea of *nolo contendere* or its equivalent, shall not (except as otherwise expressly provided in this Agreement) of itself create a presumption that Indemnatee did not act in good faith and in a manner which Indemnatee reasonably believed to be in or not opposed to the best interests of the Company or, with respect to any criminal action or Proceeding, that Indemnatee had reasonable cause to believe that Indemnatee's conduct was unlawful.

(e) Limitations. Notwithstanding the foregoing provisions of Sections 4(a) through (d) hereof, but subject to the exception set forth in Section 14 which shall control, the Company shall not be obligated to indemnify the Indemnatee for Expenses or liabilities of any type whatsoever for which payment (and the Company's indemnification obligations under this Agreement shall be reduced by such payment) is actually made to or on behalf of Indemnatee, by the Company or otherwise, under a corporate insurance policy, or under a valid and enforceable indemnity clause, right, by-law, or agreement; and, in the event the Company has previously made a payment to Indemnatee for an Expense or liability of any type whatsoever for which payment is actually made to or on behalf of the Indemnatee under an insurance policy, or under a valid and enforceable indemnity clause, by-law or agreement, Indemnatee shall return to the Company the amounts subsequently received by the Indemnatee from such other source of indemnification.

(f) Witness. In the event that Indemnatee is not a party or threatened to be made a party to a Proceeding, but is subpoenaed (or given a written request to be interviewed by or provide documents or information to a government authority) in such a Proceeding by reason of the fact that the Indemnatee is or was an Agent of the Company, or by reason of anything witnessed or allegedly witnessed by the Indemnatee in that capacity, the Company shall indemnify the Indemnatee against all actually and reasonable out of pocket costs (including without limitation legal fees) reasonably incurred by the Indemnatee in responding to such subpoena or written request for an interview. As a condition to this right, Indemnatee must provide notice of such subpoena or request to the Company within 14 days, subject to the terms of Section 7(a).

5. Indemnification for Expenses in a Proceeding in Which Indemnatee is Wholly or Partly Successful.

(a) Successful Defense. Notwithstanding any other provisions of this Agreement, to the extent Indemnatee has been successful, on the merits or otherwise, in defense of any Proceeding (including, without limitation, an action by or in the right of the Company) in which Indemnatee was a party by reason of the fact that Indemnatee is or was an Agent of the Company at any time, the Company shall indemnify Indemnatee against all Expenses actually and reasonably incurred by or on behalf of Indemnatee in connection with the investigation, defense or appeal of such Proceeding.

(b) Partially Successful Defense. Notwithstanding any other provisions of this Agreement, to the extent that Indemnatee is a party to any Proceeding (including, without limitation, an action by or in the right of the Company) in which Indemnatee was a party by reason of the fact that Indemnatee is or was an Agent of the Company at any time and is successful, on the merits or otherwise, as to one or more but less than all claims, issues or matters in such Proceeding, the Company shall indemnify Indemnatee against all Expenses actually and reasonably incurred by or on behalf of Indemnatee in connection with each successfully resolved claim, issue or matter.

(c) Dismissal. For purposes of this section and without limitation, the termination of any claim, issue or matter in such a Proceeding by dismissal, with or without prejudice, shall be deemed to be a successful result as to such claim, issue or matter.

(d) Contribution. If the indemnification provided in this Agreement is unavailable and may not be paid to Indemnatee, then to the extent allowed by law, in respect of any threatened, pending or completed action, suit or proceeding in which the Company is jointly liable with Indemnatee (or would be if joined in such action, suit or proceeding), the Company shall contribute to the amount of Expenses (including attorneys' fees), judgments, fines and amounts paid in settlement actually and reasonably incurred and paid or payable by Indemnatee in such proportion as is appropriate to reflect (i) the relative benefits received by the Company on the one hand and Indemnatee on the other hand from the transaction from which such action, suit or proceeding arose, and (ii) the relative fault of Company on the one hand and of Indemnatee on the other in connection with the events which resulted in such Expenses, judgments, fines or settlement amounts, as well as any other relevant equitable considerations. The relative fault of the Company on the one hand and of Indemnatee on the other shall be determined by reference to, among other things, the parties' relative intent, knowledge, access to information, active or passive conduct, and opportunity to correct or prevent the circumstances resulting in such Expenses, judgments, fines or settlement amounts. The Company agrees that it would not be just and equitable if contribution pursuant to this section were determined by pro rata allocation or any other method of allocation which does not take account of the foregoing equitable considerations.

6. Mandatory Advancement of Expenses.

(a) Subject to the terms of this Agreement and following notice pursuant to Section 7(a) below, the Company shall advance, interest free, all Expenses reasonably incurred by Indemnatee in connection with the investigation, defense, settlement or appeal of any Proceeding to which Indemnatee is a party or is threatened to be made a party by reason of the fact that Indemnatee is or was an Agent of the Company (unless there has been a final determination that Indemnatee is not entitled to indemnification for such Expenses) upon receipt satisfactory documentation supporting such Expenses. Such advances are intended to be an obligation of the Company to Indemnatee hereunder and shall in no event be deemed to be a personal loan. Such advancement of Expenses shall otherwise be unsecured and without regard to Indemnatee's ability to repay. The advances to be made hereunder shall be paid by the Company to Indemnatee within 30 days following delivery of a written request therefore by Indemnatee to the Company, along with such documentation and information as is reasonably available to the claimant and is reasonably necessary to determine whether and to what extent the claimant is entitled to advancement (which shall include without limitation reasonably detailed invoices for legal services, but with disclosure of confidential work product not required). The Company shall discharge its advancement duty by, at its option, (a) paying such Expenses on behalf of Indemnatee, (b) advancing to Indemnatee funds in an amount sufficient to pay such Expenses, or (c) reimbursing Indemnatee for Expenses already paid by Indemnatee. In the event that the Company fails to pay Expenses as incurred by Indemnatee as required by this paragraph, Indemnatee may seek mandatory injunctive relief (including without limitation specific performance) from any court having jurisdiction to require the Company to pay Expenses as set forth in this paragraph. If Indemnatee seeks mandatory injunctive relief pursuant to this paragraph, it shall not be a defense to enforcement of the Company's obligations set forth in this paragraph that Indemnatee has an adequate remedy at law for damages.

(b) Undertakings. By execution of this Agreement, Indemnatee agrees to repay the amount advanced only in the event and to the extent that it shall be finally determined that Indemnatee is not entitled to indemnification by the Company to the extent set forth in this agreement and under Delaware law. Indemnatee shall qualify for advances upon the execution and delivery to the Company of this Agreement. No additional undertaking, or security, shall be required of Indemnatee.

7. Notice and Other Indemnification Procedures.

(a) Notice by Indemnatee. Promptly after receipt by Indemnatee of notice of the commencement of or the threat of commencement of any Proceeding, Indemnatee shall, if Indemnatee believes that indemnification with respect thereto may be sought from the Company under this Agreement, notify the Company in writing of the commencement or threat of commencement thereof *provided, however*, that a delay in giving such notice will not deprive Indemnatee of any right to be indemnified under this Agreement unless, and then only to the extent that, the Company did not otherwise learn of the Proceeding and such delay is materially prejudicial to the Company; and, *provided, further*, that notice will be deemed to have been given without any action on the part of Indemnatee in the event the Company is a party to the same Proceeding and has notice thereof. The omission to notify the Company will not relieve the Company from any liability for indemnification which it may have to Indemnatee otherwise than under this Agreement.

(b) Insurance. If the Company receives notice pursuant to Section 7(a) hereof of the commencement of a Proceeding that may be covered under D&O Insurance then in effect, the Company shall give prompt notice of the commencement of such Proceeding to the insurers in accordance with the procedures set forth in the respective policies.

(c) Defense. In the event the Company shall be obligated to pay the Expenses of any Proceeding against Indemnitee, the Company shall be entitled to assume the defense of such Proceeding, with counsel selected by the Company and approved by Indemnitee (which approval shall not be unreasonably withheld), upon the delivery to Indemnitee of written notice of the Company's election so to do. After delivery of such notice, and the retention of such counsel by the Company, the Company will not be liable to Indemnitee under this Agreement for any fees of counsel subsequently incurred by Indemnitee with respect to the same Proceeding, provided that (i) Indemnitee shall have the right to employ his or her own counsel in any such Proceeding at Indemnitee's expense; and (ii) Indemnitee shall have the right to employ his or her own counsel in any such Proceeding at the Company's expense if (A) the Company has authorized the employment of counsel by Indemnitee at the expense of the Company; (B) Indemnitee shall have reasonably concluded based on the written advice of Indemnitee's legal counsel that there may be a conflict of interest between the Company and Indemnitee in the conduct of any such defense; or (C) the Company shall not, in fact, have employed counsel to assume the defense of such Proceeding. In addition to all the requirements above, if the Company has D&O Insurance, or other insurance, with a panel counsel requirement that may cover the matter for which indemnity is claimed by Indemnitee, then Indemnitee shall use such panel counsel or other counsel approved by the insurers, unless there is an actual conflict of interest posed by representation by all such counsel, or unless and to the extent Company waives such requirement in writing. Indemnitee and his or her counsel shall provide reasonable cooperation with such insurer on request of the Company.

8. Right to Indemnification.

(a) Right to Indemnification. In the event that Section 5(a) is inapplicable, the Company shall indemnify Indemnitee pursuant to this Agreement unless, and except to the extent that, it shall have been determined by one of the methods listed in Section 8(b) that Indemnitee has not met the applicable standard of conduct required to entitle Indemnitee to such indemnification.

(b) Determination of Right to Indemnification. A determination of Indemnitee's right to indemnification under this Section 8 shall be made at the election of the Board by (i) a majority vote of directors who are not parties to the Proceeding for which indemnification is being sought, even though less than a quorum, or by a committee consisting of directors who are not parties to the Proceeding for which indemnification is being sought, who, even though less than a quorum, have been designated by a majority vote of the disinterested directors, or (ii) if there are no such disinterested directors or if the disinterested directors so direct, by Independent Counsel in a written opinion to the Board, a copy of which shall be delivered to Indemnitee. However, in the event there has been a Change in Control, then the determination shall, at Indemnitee's sole option, be made by Independent Counsel as in (b)(ii), above, with Indemnitee choosing the Independent Counsel subject to Company's consent, such consent not to be unreasonably withheld.

(c) Submission for Decision. As soon as practicable, and in no event later than 30 days after Indemnitee's written request for indemnification, the Board shall select the method for determining Indemnitee's right to indemnification. Indemnitee shall cooperate with the person or persons or entity making such determination with respect to Indemnitee's right to indemnification, including providing to such person, persons or entity, upon reasonable advance request, any documentation or information which is not privileged or otherwise protected from disclosure and which is reasonably available to Indemnitee and reasonably necessary to such determination. Any Independent Counsel or member of the Board shall act reasonably and in good faith in making a determination regarding Indemnitee's entitlement to indemnification under this Agreement.

(d) Application to Court. If (i) a claim for indemnification or advancement of Expenses is denied, in whole or in part, (ii) no disposition of such claim is made by the Company within 60 days after the request therefore, (iii) the advancement of Expenses is not timely made pursuant to Section 6 of this Agreement or (iv) payment of indemnification is not made pursuant to Section 5 of this Agreement, Indemnatee shall have the right at his option to apply to the Delaware Court of Chancery, the court in which the Proceeding is or was pending, or any other court of competent jurisdiction, for the purpose of enforcing Indemnatee's right to indemnification (including the advancement of Expenses) pursuant to this Agreement. Upon written request by Indemnatee, the Company shall consent to service of process.

(e) Expenses Related to the Enforcement or Interpretation of this Agreement. The Company shall indemnify Indemnatee against Expenses incurred by Indemnatee in connection with any hearing or proceeding under this Section 8 involving Indemnatee, and against Expenses incurred by Indemnatee in connection with any other proceeding between the Company and Indemnatee to the extent involving the interpretation or enforcement of the rights of Indemnatee under this Agreement, if and to the extent Indemnatee is successful.

(f) In no event shall Indemnatee's right to indemnification (apart from advancement of Expenses) be determined prior to a final adjudication in the Proceeding at issue if the Proceeding is both ongoing, and of the nature to have a final adjudication.

(g) In any proceeding to determine Indemnatee's right to indemnification or advancement, Indemnatee shall be presumed to be entitled to indemnification or advancement, with the burden of proof on the Company to prove, by a preponderance of the evidence (or higher standard if required by relevant law) that Indemnatee is not so entitled.

(h) Indemnatee shall be fully indemnified for those matters where, in the performance of his duties for the Company, he relied in good faith upon the records of the Company and upon such information, opinions, reports or statements presented to the Company by any of the Company's officers or employees, or committees of the board of directors, or by any other person as to matters Indemnatee reasonably believed were within such other person's professional or expert competence and who was selected with reasonable care by or on behalf of the Company.

9. Exceptions. Any other provision herein to the contrary notwithstanding, the Company shall not be obligated:

(a) Claims Initiated by Indemnatee. To indemnify or advance Expenses to Indemnatee with respect to Proceedings or claims initiated or brought voluntarily by Indemnatee (including cross actions), with a reasonable allocation where appropriate, unless (i) such indemnification is expressly required to be made by law, (ii) the Proceeding was authorized by the Board, (iii) such indemnification is provided by the Company, in its sole discretion, pursuant to the powers vested in the Company under the General Corporation Law of Delaware or (iv) the Proceeding is brought pursuant to Section 8 specifically to establish or enforce a right to indemnification under this Agreement or any other statute or law or otherwise as required under Section 145 in advance of a final determination, in which case section 8(e) fees-on-fees provision shall control;

(b) Fees on Fees. To indemnify Indemnitee for any Expenses incurred by Indemnitee with respect to any Proceeding instituted by Indemnitee to enforce or interpret this Agreement, to the extent Indemnitee is not successful in such a Proceeding;

(c) Unauthorized Settlements. To indemnify Indemnitee under this Agreement for any amounts paid in settlement of a Proceeding unless the Company consents to such settlement, which consent shall not be unreasonably withheld;

(d) Claims Under Section 16(b). To indemnify Indemnitee for Expenses associated with any Proceeding related to, or the payment of profits made from the purchase and sale (or sale and purchase) by Indemnitee of securities of the Company within the meaning of Section 16(b) of the Securities Exchange Act of 1934, as amended, or similar provisions of state statutory law or common law (provided, however, that the Company must advance Expenses for such matters as otherwise permissible under this Agreement); or

(e) Payments Contrary to Law. To indemnify or advance Expenses to Indemnitee for which payment is prohibited by applicable law.

10. Non-Exclusivity. The provisions for indemnification and advancement of Expenses set forth in this Agreement shall not be deemed exclusive of any other rights which Indemnitee may have under any provision of law, the Company's Amended and Restated Certificate of Incorporation, as amended, or Bylaws, the vote of the Company's stockholders or disinterested directors, other agreements, or otherwise, both as to action in Indemnitee's official capacity and as to action in another capacity while occupying Indemnitee's position as an Agent of the Company. Indemnitee's rights hereunder shall continue after Indemnitee has ceased acting as an Agent of the Company and shall inure to the benefit of the heirs, executors and administrators of Indemnitee.

11. Permitted Defenses. It shall be a defense to any action for which a claim for indemnification is made under this Agreement (other than an action brought to enforce a claim for Expenses pursuant to Section 6 hereof, provided that the required documents have been tendered to the Company) that Indemnitee is not entitled to indemnification because of the limitations set forth in Sections 4 and 9 hereof. Neither the failure of the Company (including its Board of Directors) or an Independent Counsel to have made a determination prior to the commencement of such enforcement action that indemnification of Indemnitee is proper in the circumstances, nor an actual determination by the Company (including its Board of Directors) or an Independent Counsel that such indemnification is improper, shall be a defense to the action or create a presumption that Indemnitee is not entitled to indemnification under this Agreement or otherwise. In making any determination concerning Indemnitee's right to indemnification, there shall be a presumption that Indemnitee has satisfied the applicable standard of conduct. Any determination by the Company concerning Indemnitee's right to indemnification that is adverse to Indemnitee may be challenged by the Indemnitee in the Court of Chancery of the State of Delaware.

12. Subrogation. In the event the Company is obligated to make a payment under this Agreement, the Company shall be subrogated to the extent of such payment to all of the rights of recovery under any corporate insurance policy or any other indemnity agreement covering Indemnitee, who shall execute all documents reasonably required and take all action that may be necessary to secure such rights and to enable the Company effectively to bring suit to enforce such rights (provided that the Company pays Indemnitee's costs and expenses of doing so), including without limitation by assigning all such rights to the Company or its designee to the extent of such indemnification or advancement of Expenses. The Company's obligation to indemnify or advance expenses under this Agreement shall be reduced by any amount Indemnitee has collected from such other source, and in the event that Company has fully paid such indemnity or expenses, Indemnitee shall return to the Company any amounts subsequently received from such other source of indemnification. With regard to third party indemnitors, however, Section 13 shall control over this section.

13. Primacy of Indemnification. The Company hereby acknowledges that Indemnatee may have certain rights to indemnification, advancement of expenses or liability insurance provided by one or more third-parties (the “Third Party Indemnitors”). The Company hereby agrees that (i) it is the indemnitor of first resort, *i.e.*, its obligations to Indemnatee under this Agreement and any indemnity provisions set forth in its Amended and Restated Certificate of Incorporation, as amended, Bylaws or elsewhere (collectively, “Indemnity Arrangements”) are primary, and any obligation of the Third Party Indemnitors to advance expenses or to provide indemnification for the same Expenses or liabilities incurred by Indemnatee is secondary and excess, (ii) it shall advance the full amount of Expenses incurred by Indemnatee and shall be liable for the full amount of all Expenses, judgments, penalties, fines and amounts paid in settlement by or on behalf of Indemnatee, to the extent legally permitted and as required by any Indemnity Arrangement, without regard to any rights Indemnatee may have against the Third Party Indemnitors, and (iii) it irrevocably waives, relinquishes and releases the Third Party Indemnitors from any claims against the Third Party Indemnitors for contribution, subrogation or any other recovery of any kind arising out of or relating to any Indemnity Arrangement. The Company further agrees that no advancement or indemnification payment by any Third Party Indemnitor on behalf of Indemnatee shall affect the foregoing, and the Third Party Indemnitors shall be subrogated to the extent of such advancement or payment to all of the rights of recovery of Indemnatee against the Company. The Company and Indemnatee agree that the Third Party Indemnitors are express third party beneficiaries of the terms of this Section 13. The Company, on its own behalf and on behalf of its insurers to the extent allowed by the policies, waives subrogation rights against Indemnatee.

14. Broadest Interpretation. The Company hereby agrees to indemnify Indemnatee to the fullest extent permitted by law, notwithstanding that such indemnification is not specifically authorized by the other provisions of this Agreement, the Company’s Amended and Restated Certificate of Incorporation, as amended, or Bylaws as now or hereafter in effect, or by statute. In the event of any change after the date of this Agreement in any applicable law, statute or rule which expands the right of a Delaware corporation to indemnify a member of its Board of Directors or an officer, employee, agent or fiduciary, it is the intent of the parties hereto that Indemnatee shall enjoy by this Agreement the greater benefits afforded by such change. In the event of any change in any applicable law, statute or rule which narrows the right of a Delaware corporation to indemnify a member of its Board of Directors or an officer, employee, agent or fiduciary, such change, to the extent not otherwise required by such law, statute or rule to be applied to this Agreement, shall have no effect on this Agreement or the parties’ rights and obligations hereunder.

15. No Imputation. The knowledge or actions, or failure to act, of any director, officer, employee, or agent of the Company, or the Company itself shall not be imputed to Indemnatee for the purpose of determining Indemnatee’s rights hereunder.

16. Survival of Rights.

(a) All agreements and obligations of the Company contained herein shall continue during the period Indemnatee is an Agent of the Company and shall continue thereafter so long as Indemnatee shall be subject to any possible claim or threatened, pending or completed Proceeding by reason of the fact that Indemnatee was serving in the capacity referred to herein.

(b) The Company shall require any successor to the Company (whether direct or indirect, by purchase, merger, consolidation or otherwise) to all or substantially all of the business or assets of the Company, expressly to assume and agree to perform this Agreement in the same manner and to the same extent that the Company would be required to perform if no such succession had taken place.

17. Interpretation of Agreement. It is understood that the parties hereto intend this Agreement to be interpreted and enforced so as to provide indemnification to Indemnitee to the fullest extent permitted by law, including those circumstances in which indemnification would otherwise be discretionary.

18. Severability. If any provision or provisions of this Agreement shall be held to be invalid, illegal or unenforceable for any reason whatsoever, (i) the validity, legality and enforceability of the remaining provisions of the Agreement (including, without limitation, all portions of any paragraphs of this Agreement containing any such provision held to be invalid, illegal or unenforceable, that are not themselves invalid, illegal or unenforceable) shall not in any way be affected or impaired thereby, and (ii) to the fullest extent possible, the provisions of this Agreement (including, without limitation, all portions of any paragraph of this Agreement containing any such provision held to be invalid, illegal or unenforceable, that are not themselves invalid, illegal or unenforceable) shall be construed so as to give effect to the intent manifested by the provision held invalid, illegal or unenforceable and to give effect to this Section.

19. Entire Agreement. This Agreement constitutes the entire agreement between the parties with respect to the matters addressed herein, and any other prior or contemporaneous oral or written understandings or agreements with respect to the matters addressed herein (including without limitation any prior indemnification agreement for Indemnitee) are expressly superseded by this Agreement.

20. Modification and Waiver. No supplement, modification or amendment of this Agreement shall be binding unless it is in a writing signed by both of the parties hereto. No waiver of any of the provisions of this Agreement shall be deemed or shall constitute a waiver of any other provisions hereof (whether or not similar) nor shall such waiver constitute a continuing waiver.

21. Notice. All notices, requests, demands and other communications under this Agreement shall be in writing and shall be deemed to have been duly given (a) upon delivery if delivered by hand to the party to whom such notice or other communication shall have been directed, (b) if mailed by certified or registered mail with postage prepaid, return receipt requested, on the third business day after the date on which it is so mailed, (c) one business day after the business day of deposit with a nationally recognized overnight delivery service, specifying next day delivery, with written verification of receipt, or (d) on the same day as delivered by confirmed facsimile transmission if delivered during business hours or on the next successive business day if delivered by confirmed facsimile transmission after business hours. Addresses for notice to either party shall be as shown on the signature page of this Agreement, or to such other address as may have been furnished by either party in the manner set forth above.

22. Governing Law. This Agreement shall be governed exclusively by and construed according to the laws of the State of Delaware as applied to contracts between Delaware residents entered into and to be performed entirely within Delaware. This Agreement is intended to be an agreement of the type contemplated by Section 145(f) of the General Corporation Law of Delaware.

23. Counterparts. This Agreement may be executed in one or more counterparts, each of which shall for all purposes be deemed to be an original but all of which together shall constitute one and the same Agreement. Only one such counterpart signed by the party against whom enforcement is sought needs to be produced to evidence the existence of this Agreement.

The parties hereto have entered into this Indemnification Agreement, including the undertaking contained herein, effective as of the date first above written.

Indemnitee:

Address: _____

The Company:

BONE BIOLOGICS, CORPORATION

By: _____
Name: Jeff Frelick
Title: President and Chief Executive Officer

Consent of Independent Registered Public Accounting Firm

We consent to the use in this Registration Statement on Form S-1 of our report dated March 30, 2023, (except for the effects of the reverse stock splits described in Notes 1 and 9, as to which the date is January 30, 2024) which includes an explanatory paragraph regarding the Company’s ability to continue as a going concern, relating to the consolidated financial statements of Bone Biologics Corporation included herein. We also consent to the reference to our firm under the caption “Experts” in such Registration Statement and related Prospectus.

/s/Weinberg & Company, P.A.
Los Angeles, California
January 30, 2024

Calculation of Filing Fee Tables

Form S-1
(Form Type)

Bone Biologics Corporation
(Exact Name of Registrant as Specified in its Charter)

Table 1: Newly Registered Securities

Security Type	Security Class Title ⁽¹⁾	Fee Calculation Rule	Amount Registered	Proposed Maximum Offering Price Per Unit	Maximum Aggregate Offering Price ⁽²⁾	Fee Rate	Amount of Registration Fee
Equity	Common Stock, par value \$0.001 per share	457(o)			\$ 5,000,000 ⁽³⁾	.00014760	\$ 738.00
Equity	Pre-Funded Warrants ⁽⁴⁾	Other					-
Equity	Common Warrants ⁽⁴⁾	Other					-
Equity	Placement Agent Warrants ^{(4) (5)}	Other					-
Equity	Common Stock issuable upon exercise of the Pre-Funded Warrants	457(o)					(3)
Equity	Common Stock issuable upon exercise of the Common Warrants	457(o)			\$ 5,000,000	.00014760	\$ 738.00
Equity	Common stock issuable upon exercise of the Placement Agent Warrants ⁽⁵⁾	457(o)			\$ 375,000	.00014760	\$ 55.35
Total Offering Amounts					\$ 10,375,000		\$ 1,531.35
Total Fees Previously Paid							\$ 0.00
Total Fee Offsets							\$ 0.00
Net Fee Due							\$ 1,531.35

- (1) Pursuant to Rule 416 of the Securities Act, the securities registered hereunder include such indeterminate number of additional shares of common stock as may be issued after the date hereof as a result of stock splits, stock dividends or similar transactions.
- (2) Estimated solely for the purpose of calculating the registration fee pursuant to Rule 457(o) under the Securities Act of 1933, as amended (the “Securities Act”).
- (3) The proposed maximum aggregate offering price of the common stock proposed to be sold in the offering will be reduced on a dollar-for-dollar basis based on the offering price of any pre-funded warrants sold in the offering, and, as such, the proposed maximum aggregate offering price of the common stock and pre-funded warrants (including the common stock issuable upon exercise of the pre-funded warrants), if any, is \$5,000,000.
- (4) Pursuant to Rule 457(g) of the Securities Act, no separate registration fee is required for the warrants because the warrants are being registered in the same registration statement as the common stock issuable upon exercise of the warrants.
- (5) The Placement Agent Warrants are exercisable for a number of shares of common stock equal to 6% of the shares of common stock sold in this offering (including the shares of common stock issuable upon the exercise of the pre-funded warrants), at an exercise price equal to 125% of the public offering price per share and accompanying warrant.