Filed Pursuant to Rule 424(b)(5)
Registration Nos. 333-278322 and 333-280805

PROSPECTUS SUPPLEMENT
(To Prospectus dated April 8, 2024)

Up to $60,000,000

Pulse Biosciences, Inc.

Common Stock

We have entered into an equity distribution agreement (the "Equity Distribution Agreement") with Canaccord Genuity LLC and Needham & Company, LLC (jointly and severally, the "Agents"), relating to the offer and sale of shares of our common stock, par value $0.001 per share. Under this prospectus supplement, we may offer and sell shares of our common stock having an aggregate offering price of up to $60,000,000, from time to time, through the Agents, acting as our agents in accordance with the terms of the Equity Distribution Agreement.

Sales of our common stock, if any, under this prospectus supplement may be deemed to be an "at the market offering" as defined in Rule 415(a)(4) promulgated under the Securities Act of 1933, as amended (the "Securities Act"). The Agents are not required to sell any specific number or dollar amount of securities, but each will act as our sales agent and use commercially reasonable efforts to sell on our behalf all of the shares of common stock requested to be sold by us, consistent with its normal trading and sales practices, on mutually agreed terms between us and the Agents. There is no arrangement for funds to be received in any escrow, trust or similar arrangement.

The Agents will be entitled to a commission of up to 3.0% of the gross sales price per share of common stock sold under the Equity Distribution Agreement. In connection with the sale of our common stock on our behalf, the Agents will be deemed to be "underwriters" within the meaning of the Securities Act and the compensation of the Agents will be deemed to be underwriting commissions or discounts. We have also agreed to provide indemnification and contribution to the Agents with respect to certain liabilities, including liabilities under the Securities Act or the Securities Exchange Act of 1934, as amended (the "Exchange Act"). See "Plan of Distribution" beginning on page S-21 for additional information regarding the compensation to be paid to the Agents.

You should read this prospectus supplement, the base prospectus, and any additional prospectus supplement or amendment carefully before you invest in our securities.

Our common stock is listed on The Nasdaq Capital Market ("Nasdaq") under the symbol "PLSE". On July 12, 2024, the last reported sale price of our common stock on Nasdaq was $18.58.

Investing in our securities involves a high degree of risk. See "Risk Factors" section beginning on page S-15 of this prospectus supplement and any other risk factors contained in any applicable prospectus supplement and in the documents incorporated by reference herein and therein.

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

Canaccord Genuity **Needham & Company**

The date of this prospectus supplement is July 15, 2024.

TABLE OF CONTENTS

Prospectus Supplement

Prospectus

ABOUT THIS PROSPECTUS SUPPLEMENT

This prospectus supplement is part of a Registration Statement on Form S-3 (the "Registration Statement") that we filed with the U.S. Securities and Exchange Commission ("SEC") on March 28, 2024, using the "shelf" registration process, and a related registration statement filed on July 15, 2024 pursuant to Rule 462(b) of the Securities Act. By using a shelf registration statement, we may offer and sell securities having an aggregate offering price of up to $60,000,000 from time to time under the Registration Statement at prices and on terms to be determined by market conditions at the time of offering.

This prospectus supplement provides you with a description of the offering. You should read this prospectus supplement together with the additional information to which we refer you in the section of this prospectus supplement entitled "Where You Can Find More Information," and together with the information incorporated by reference as described in the section of this prospectus supplement entitled "Information Incorporated By Reference."

We provide information to you about this offering in two separate documents that are bound together: (i) this prospectus supplement, which describes the specific details regarding this offering; and (ii) the accompanying base prospectus, which provides general information, some of which may not apply to this offering. Generally, when we refer to this "prospectus," we are referring to both documents combined. If information in this prospectus supplement is inconsistent with the accompanying base prospectus, you should rely on this prospectus supplement. To the extent there is a conflict between the information contained in this prospectus supplement and the information contained in any document incorporated by reference in this prospectus supplement, you should rely on the information in this prospectus supplement. If any statement in one of these documents is inconsistent with a statement in another document having a later date (for example, a document incorporated by reference in this prospectus supplement), the statement in the document having the later date modifies or supersedes the earlier statement.

You should rely only on the information incorporated by reference or set forth in this prospectus supplement. We have not, and the Agents have not, authorized anyone to provide you with any information or to make any representations other than those contained in this prospectus supplement. We and the Agents do not take responsibility for, and can provide no assurance as to the reliability of, any other information that others may give you. We will not, and the Agents will not, make an offer to sell these securities in any jurisdiction where the offer or sale is not permitted. You should assume that the information appearing in this prospectus supplement is accurate only as of the date on the front cover of this prospectus supplement. Our business, financial condition, results of operations, and prospects may have changed since that date.

For investors outside of the United States: We have not, and the Agents have not, done anything that would permit this offering or possession or distribution of this prospectus supplement in any jurisdiction where action for that purpose is required, other than the United States. Persons outside of the United States who come into possession of this prospectus supplement must inform themselves about, and observe any restrictions relating to, the offering of securities and the distribution of this prospectus supplement outside of the United States.

We urge you to read carefully this prospectus supplement, together with information incorporated by reference herein, before deciding whether to invest in the securities being offered.

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

We use various trademarks and trade names in our business, including without limitation our corporate name and logo. All other trademarks or trade names referred to in this prospectus supplement are the property of their respective owners. Solely for convenience, the trademarks and trade names in this prospectus supplement may be referred to without the ® and ™ symbols, but such references should not be construed as any indicator that their respective owners will not assert, to the fullest extent under applicable law, their rights thereto.

CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus supplement and the other documents we have filed with the SEC that are incorporated by reference herein contain forward-looking statements within the meaning of Section 21E of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), and Section 27A of the Securities Act. Certain statements in this prospectus supplement may constitute "forward-looking statements" for purposes of the federal securities laws. Our forward-looking statements include, but are not limited to, statements regarding our or our management team's expectations, hopes, beliefs, intentions or strategies regarding our future operations. In addition, any statements that refer to projections, forecasts or other characterizations of future events or circumstances, including any underlying assumptions, are forward-looking statements. The words "anticipate," "believe," "contemplate," "continue," "could," "estimate," "expect," "intends," "may," "might," "plan," "possible," "potential," "predict," "project," "should," "will," "would" and similar expressions may identify forward-looking statements, but the absence of these words does not mean that a statement is not forward-looking.

These forward-looking statements may include, but are not limited to, statements relating to the effectiveness of our CellFX nsPFA technology and CellFX System to non-thermally clear cells, statements concerning our expected product development efforts and future clinical studies and regulatory submissions, whether with the U.S. Food and Drug Administration (the "FDA") or otherwise, statements related to our expected business, new product introductions, and the timing of FDA or non-U.S. filings or approvals, including meetings with the FDA or non-U.S. regulatory bodies, future results of operations, future financial position, our ability to generate revenues, our financing plans and future capital requirements, anticipated costs of revenue, anticipated expenses, our ability to finance operations from cash flows or otherwise, and statements based on current expectations, estimates, forecasts, and projections about the economies and markets in which we operate and intend to operate and our beliefs and assumptions regarding these economies and markets.

Forward-looking statements are not guarantees of future performance and are subject to risks and uncertainties. We have based these forward-looking statements on assumptions and assessments made by our management in light of their experience and their perception of historical trends, current conditions, expected future developments, and other factors they believe to be appropriate.

Important factors that could cause actual results, developments and business decisions to differ materially from those anticipated in these forward-looking statements include, among others, those factors referred to in each of our Annual Report on Form 10-K for the fiscal year ended December 31, 2023 and our Quarterly Report on Form 10-Q for the fiscal quarter ended March 31, 2024, each of which is incorporated by reference herein.

These statements are only current predictions and are subject to known and unknown risks, uncertainties, and other factors that may cause our or our industry's actual results, levels of activity, performance, or achievements to be materially different from those anticipated by the forward-looking statements. We discuss many of these risks in the documents incorporated by reference herein. 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 future results, levels of activity, performance, or achievements. Except as required by law, we are under no duty to update or revise any of the forward-looking statements, whether as a result of new information, future events or otherwise, after the date of this prospectus supplement.

MARKET AND INDUSTRY DATA

We obtained the industry and market data used throughout this prospectus supplement from our own internal estimates and research, as well as from independent market research, industry and general publications and surveys, governmental agencies, publicly available information and research, surveys, and studies by third parties. Internal estimates are derived from publicly available information released by industry analysts and third-party sources, our internal research and our industry experience, and are based on assumptions made by us based on such data and our knowledge of our industry and market, which we believe to be reasonable. In some cases, we do not expressly refer to the sources from which this data is derived. In addition, while we believe the industry and market data included in this prospectus supplement is reliable and based on reasonable assumptions, such data involve material risks and other uncertainties and are subject to change based on various factors, including those discussed in "Risk Factors." These and other factors could cause results to differ materially from those expressed in the estimates made by the independent parties or by us.

PROSPECTUS SUPPLEMENT SUMMARY

This summary highlights selected information from this prospectus supplement and does not contain all of the information that is important to you in making an investment decision. This summary is qualified in its entirety by the more detailed information included elsewhere in this prospectus supplement. Before making your investment decision with respect to our securities, you should carefully read this entire prospectus supplement, the accompanying base prospectus and the information incorporated herein and therein by reference. Unless the context otherwise requires, references to "we," "us," "our," the "Company," "Pulse", "Pulse Biosciences" and similar designations are intended to mean the business and operations of Pulse Biosciences, Inc. and its consolidated subsidiaries.

Overview

We are a novel bioelectric medicine company committed to health innovation using our patented Nano-pulse Stimulation ("NPS") technology, a revolutionary energy modality that delivers nanosecond-duration pulses of electrical energy, each less than a millionth of a second long, to non-thermally clear targeted cells. NPS technology, also referred to as Nanosecond Pulsed-Field Ablation ("nsPFA") technology when used to ablate cellular tissue, can be used to treat a variety of medical conditions for which an optimal solution remains unfulfilled. We developed our proprietary CellFX System, a novel nsPFA delivery platform, and commercialized the initial application of its nsPFA technology to treat benign lesions of the skin. In parallel, we have designed a variety of applicators, or end-effectors, to explore the potential use of the CellFX platform to treat disorders in other medical specialties, such as cardiology, gastroenterology, gynecology, and ear, nose and throat. These applicators include devices for open surgical procedures, endoscopic or minimally invasive procedures, and endoluminal catheters, and each has been used in preclinical studies. Based on our preclinical experience and the potential to significantly improve outcomes for patients in a large and growing market, we decided in 2022 to focus our primary efforts on the use of nsPFA energy and the CellFX platform in the treatment of atrial fibrillation and in a select few other markets where it could have a profound positive impact on healthcare for both patients and providers, such as soft tissue ablation.

CellFX nsPFA Percutaneous Electrode System

Our first commercial-ready product for soft tissue ablation in a surgical setting, the CellFX nsPFA Percutaneous Electrode System, consists of a percutaneous needle electrode for use with our proprietary CellFX nsPFA Console. The novel electrode is designed to harness and deliver the key advantages of nsPFA energy, enabling precise nonthermal removal of cellular tissue without inducing thermal necrosis.

Since early 2023, we have made progress in our percutaneous electrode program. After years of preclinical development and testing, in June 2023, we initiated a first-in-human study using our novel and proprietary nsPFA-enabled surgical end-effector, our percutaneous electrode. This study, which is still ongoing, is being conducted by Professor Stefano Spiezia at the Ospedale del Mare in Naples, Italy, to help us better understand and confirm the mechanism of action and tissue response of nsPFA energy in internal organs such as the thyroid. To date, we have treated over twenty study subjects. All of the initial patients in the study tolerated the procedure well with no reported serious side effects. Ultrasound images post-procedure have shown that the treated portions of the thyroid nodules have mostly been resorbed with no sign of scarring or fibrosis, which can be a side effect of other ablation modalities. Based on these positive initial results, in November 2023, we amended the thyroid study protocol in Italy to expand enrollment to gather additional clinical experience and further optimize treatment parameters. We expect to complete this study in 2025.

In parallel, in November 2023, we filed a premarket notification 510(k) with the FDA for clearance to commercialize our novel CellFX nsPFA Percutaneous Electrode System in the United States. In March 2024, we

received FDA 510(k) clearance for our CellFX nsPFA Percutaneous Electrode System for use in the ablation of soft tissue in percutaneous and intraoperative surgical procedures.

Having secured 510(k) clearance to market and sell the CellFX nsPFA Percutaneous Electrode System in the United States, we have engaged with experts in the field of soft tissue ablation to gather information that will help shape our future commercial endeavors. To date, we have placed our CellFX System with five sites in the United States and these sites have been performing initial patient treatments and evaluating the CellFX System under 90-day evaluation agreements. We believe our future commercial success will be positively impacted by our ability to offer a variety of sizes of percutaneous electrodes capable of soft tissue ablation, including percutaneous electrodes smaller than the one cleared by the FDA earlier this year. We expect to pursue more evidenced-based milestones throughout 2024 and into 2025 in connection with evaluating the early pilot commercialization of our percutaneous electrodes.

Our Cardiac Surgical Program

Atrial fibrillation ("AF") is a type of heart arrythmia, or irregular heartbeat, caused by faulty electrical signals in the heart. AF is a highly prevalent condition and is growing significantly with an ageing population. It is estimated that 43 million people worldwide are affected by AF. Treatment requires the precise and safe ablation of heart tissue to block or otherwise prevent these faulty electrical signals from causing the irregular heartbeat, and we believe nsPFA technology is uniquely suited to perform an integral role for this application and that it will prove to be highly differentiated from standard thermal energy modalities in use today.

We have developed a cardiac ablation clamp for use in cardiac surgery and a cardiac endocardial ablation catheter for use in electrophysiology. Based on preclinical testing, we obtained Breakthrough Device Designation on July 5, 2024 for our cardiac clamp. We have also taken steps to initiate a clinical study of our CellFX nsPFA cardiac clamp in the Netherlands and, in January 2024, we filed a premarket notification 510(k) with the FDA for clearance to commercialize our novel CellFX nsPFA Cardiac Clamp in the United States with a broad indication for ablation of cardiac tissue. After interactions with the FDA, and in light of securing the Breakthrough Device Designation, we now plan to pursue a pre-market approval ("PMA") application for FDA approval to market the cardiac clamp, which will require pivotal clinical data to support the application. We expect to begin our pivotal clinical trial of the cardiac clamp as a potential treatment for AF in 2025. In our other cardiac program, in December 2023, we initiated a clinical study in Prague, Czech Republic, to test our CellFX nsPFA 360° Cardiac Catheter in patients with AF and early acute data and remapping (follow-up) data from this study have been promising. The results of preclinical testing of both cardiac products, our surgical ablation clamp and our endocardial ablation catheter, have exceeded our expectations and much of the data have been published or presented at physician or industry conferences. While these devices serve different physicians, the application of the energy to safely and effectively ablate cardiac tissue and the treatment of AF are the same, and we believe there will be important synergies realized through their contemporaneous development. The Company's cardiac surgical ablation clamp and cardiac endocardial ablation catheter both use the CellFX System to generate our proprietary pulses of electrical energy.

CellFX nsPFA Cardiac Clamp

Our surgical cardiac ablation clamp is designed for use by cardiac surgeons during the surgical treatment of AF. The standard of care surgical procedure for the treatment of AF is performed by cardiac surgeons and called the Cox-Maze procedure. The Cox-Maze procedure typically uses thermal ablation technologies, such as heat with radiofrequency ablation or cold with cryoablation, to create specific ablation lines in the heart muscle. The ablation lines block the conduction of electrical impulses and can cure the patient of their AF.

We believe our CellFX nsPFA technology can provide important advantages over today's thermal modalities in creating these ablation lines. For example, surgeons using the CellFX System should be able to

deliver faster ablations through thicker tissue than thermal modalities because of the nonthermal mechanism of action that nsPFA employs, which is not affected by heatsinks such as the blood in the heart. In preclinical studies, our CellFX nsPFA Cardiac Clamp has consistently achieved transmural ablations in less than two seconds, independent of tissue type or thickness. Moreover, thermal modalities may cause char formation on electrode surfaces which can cause gaps in the ablation lines that might lead to treatment failure. This should not be an issue with CellFX nsPFA ablation given its nonthermal nature. We believe these advantages will be important to cardiac surgeons, so we are working with leaders in the field to develop this technology quickly. In May 2023, we appointed Dr. Gan Dunnington as our Chief Medical Officer, Cardiac Surgery. Dr. Dunnington is a cardiothoracic surgeon and the Director of Cardiothoracic Surgery at St. Helena Hospital (Napa Valley). He specializes in minimally invasive complex cardiothoracic procedures for the treatment of AF. And, in October 2023, we appointed Dr. Niv Ad as our Chief Science Officer, Cardiac Surgery. Dr. Ad specializes in the surgical treatment of AF, minimally invasive heart surgery and other advanced heart surgery techniques and transcatheter therapies.

Over the last several years, we have been developing the cardiac ablation clamp from proof-of-concept to prototype, and we now have what we believe is our initial clinical design. Since 2023, we have been meeting with the FDA to discuss the regulatory requirements for a potential 510(k) clearance or other approval to market our cardiac clamp in the United States. In 2023, with guidance from the FDA, we completed a preclinical study, known as a Good Laboratory Practices or "GLP" study and, in January 2024, we filed a premarket notification 510(k) with the FDA for our novel CellFX nsPFA Cardiac Clamp. After interactions with the FDA, however, we now plan to pursue a PMA application for FDA approval to market the cardiac clamp, which will require pivotal clinical data to support the application. With PMA approval, we expect that we would commercialize the nsPFA Cardiac Surgical System in the United States specifically as a treatment for AF. If granted by the FDA, a specific treatment indication would permit direct marketing of the treatment benefits provided by the device. We expect to begin our pivotal clinical trial for AF in 2025. In parallel, we have submitted an ethics committee application including a clinical protocol to treat up to 30 patients in the Netherlands. This study would provide information on first-in-human effectiveness and safety with our cardiac surgical ablation clamp.

In July 2024, we received Breakthrough Device Designation from the FDA for our CellFX nsPFA Cardiac Surgery System for the treatment of AF. The FDA's Breakthrough Devices Program is a voluntary program for certain medical devices that potentially provide for more effective treatment or diagnosis of a life-threatening or irreversibly debilitating disease or condition. The program is designed to expedite the development and review of these medical devices and it is intended to provide patients and health care providers with timely access to medical devices by speeding up development, assessment, and review for premarket approval, 510(k) clearance, or De Novo marketing authorization. Breakthrough Devices must still meet the FDA's rigorous standards for device safety and effectiveness in order to be authorized for marketing.

CellFX nsPFA 360° Cardiac Catheter

We believe our cardiac endocardial catheter ablation device will have many of the same advantages that the cardiac surgical ablation clamp appears to have with respect to both performance and safety compared to standard thermal modalities. Our catheter is uniquely designed to provide a circumferential, or circular, ablation in a single treatment cycle. We believe this will enable faster treatment times compared to what is currently performed with thermal modalities, especially when ablating around the pulmonary veins, a common treatment approach for AF.

In recent years, Pulsed Field Ablation ("PFA") has gained attention in electrophysiology for the treatment of AF because of its safety profile and speed. Current clinical products employing PFA in AF treatment differ from CellFX nsPFA technology in that the pulse widths are longer, typically in the 10's to 100's of microseconds. We believe CellFX nsPFA can offer similar safety advantages as PFA and may provide improved efficacy advantages based on the circumferential design of our catheter and because it appears CellFX nsPFA technology can create deeper ablations.

Similar to the cardiac ablation clamp, our proprietary catheter has been in development for several years and we have been working with leaders in the electrophysiology field to test the catheter in preclinical studies. After seeing encouraging preclinical results, in December 2023, we initiated a clinical study in Prague, Czech Republic, to test our CellFX nsPFA 360° Cardiac Catheter in patients with AF and early acute data and remapping data from this study have been promising. We believe the catheter will need to go through the PMA process for FDA approval to market and sell our cardiac endocardial catheter in the United States.

The CellFX Console

The CellFX Console is a tunable, software-enabled, console-based platform, designed to accommodate the clinical workflow preferred by physicians. The CellFX System is configured to accept a variety of end-effectors or electrodes across a range of clinical applications. In February 2021, we received 510(k) clearance from the FDA for the CellFX System for dermatologic procedures requiring ablation and resurfacing of the skin. In January 2021, we received Conformité Européene ("CE") marking approval for the CellFX System, which allows for marketing of the system in the European Union ("EU"). Shortly after these regulatory clearances, we began commercializing the CellFX System in dermatology for the treatment of benign skin lesions. However, in September 2022, we announced a shift in our focus from dermatology to cardiology and the treatment of AF. We have ceased all commercial sales and marketing operations in dermatology. At the present time, we continue to support our remaining commercial users and remain open to a potential commercial partnership. The CellFX System is being used for our current efforts in the treatment of AF and as part of the CellFX nsPFA Percutaneous Electrode System.

We continue to believe nsPFA ablation, as well as NPS technology more broadly, has the potential to provide superior outcomes across a variety of medical disciplines and we may seek partnership opportunities to develop additional applications.

Financing Our Business

Over the past few years, Robert Duggan, our majority stockholder and Executive Director, has made significant investments in our Company to fund its operations. In June 2022, we completed a common stock rights offering to our existing stockholders, which raised $15 million in aggregate. Mr. Duggan purchased approximately 56% of the shares offered through this offering. Then, in September 2022, we entered into a loan agreement with Mr. Duggan pursuant to which he lent us $65 million to fund our product development operations. In April 2023, this loan agreement was terminated upon Mr. Duggan and us entering into a Securities Purchase Agreement whereby the shares were paid for through the cancellation of both the principal sum of $65.0 million and all accrued and unpaid interest owed at the time under the 2022 loan agreement, which totaled approximately $0.2 million. In June 2024, we completed a rights offering of units (each unit comprising a share of our common stock and two warrants, each to purchase a one-half share of our common stock) to our existing stockholders, which raised $60 million in aggregate. Mr. Duggan purchased approximately 88% of the shares offered through this offering. Mr. Duggan may or may not elect to participate in any number of future fundraisings by the Company, whether similar to those described above or otherwise, and he may choose to invest more than his current pro rata share in any of these fundraisings, or alternatively he may offer to provide additional debt financing as may be needed in order to maintain the Company as a going concern.

The source, timing and availability of any future financing will depend largely upon market conditions and perceived progress in the Company's on-going product development initiatives, as well as future clinical and regulatory developments concerning the CellFX System and our other NPS-based technologies. Funding may not be available when needed, at all or on terms acceptable to us. Lack of necessary funds may require us to, among other things, delay, scale back or eliminate some or all of our commercial activities, reduce headcount, trim research and product development programs, discontinue clinical trials, stop all or some of our manufacturing

operations, defer capital expenditures, deregister from being a publicly traded company and delist from Nasdaq, or license our potential products or technologies to third parties, possibly on terms that cannot sustain our current business. In addition, economic instability caused by the armed conflicts in Ukraine and Israel and high interest rates, together with other market factors, could have an adverse impact on potential sources of future financing.

We have incurred substantial operating losses and have used cash in our operating activities since inception. To fund our business, we may utilize some combination of public or private equity offerings, debt financings, or potential new collaborations in the future. There can be no assurance, however, that any additional financing or any revenue-generating collaboration will be available when needed or that we will be able to obtain financing or enter into a collaboration on terms acceptable to us.

Intellectual Property

We maintain a portfolio of intellectual property surrounding our CellFX System and our NPS technology platform. As a medical technology company, our current patents and ongoing intellectual property development are, and will continue to be, a priority for our business. We believe our intellectual property is an important competitive advantage for us. We also rely on trade secrets, know-how, continuing technological innovations, and licensing opportunities to further develop, maintain, and strengthen our competitive position. We actively protect our intellectual property through a combination of patent registrations, trademarks, and copyright protections; confidentiality agreements with our employees, consultants, and other parties; and access control to sensitive information.

Today, we either own or exclusively license, on a royalty free basis, more than 250 issued patents and pending patent applications worldwide. The vast majority of our granted patents have an expiration date between 2035 and 2042. As in the past, we plan to continue to file new patent applications to protect our systems, algorithms, applicators, methods, and designs of our technologies and products as they evolve. Medical technologies such as ours may be utilized in many different applications and incorporate several patentable features, and our strategy will be to always strive to protect our products and technologies with multiple patents directed to the variety of features and applications, in order to establish a strong and useful patent portfolio against competitors, such that an expiration of a single patent should not lessen our overall comprehensive coverage and competitive advantage. We believe our NPS platform and CellFX System are protected by several issued patents, as well as pending applications.

Employees and Human Capital

As of December 31, 2023, we had 56 employees, of which substantially all were located at our research and development facility in Hayward, California. Of these employees, half were engaged in research and development activities and half were engaged in operations, marketing, business development, and general and administrative activities.

Talent Acquisition and Development. We are committed to providing a respectful work environment to our diverse workforce. We provide equal employment opportunities to all persons regardless of race, age, color, gender, sexual orientation, national origin, physical or mental disability, religion, or any other characteristic protected by federal, state, or local law.

We believe our employees are essential to our success and our ability to attract, develop, and retain key talent is a vital part of that. Our philosophy is to both develop talent from within and to strategically recruit key external talent. Our overall talent acquisition and retention strategy is designed to attract and retain diverse and qualified candidates to enable the success of the Company and achievement of our performance goals. The skills, experience and industry knowledge of key employees significantly benefit our operations and performance.

Compensation and Benefits Program. Our compensation program is designed to attract, motivate, and retain talented individuals who possess the skills necessary to support our business and contribute to our strategic goals, creating long-term value for our stockholders. We provide employees with competitive compensation packages that include base salary, annual incentive bonuses, 401(k), and equity awards tied to the value of our stock price. Our comprehensive benefits package also includes medical, dental, vision, life and disability plans, and an employee assistance program.

Wellness and Safety. The health and safety of our employees is of utmost importance to us. We currently operate under a hybrid model of onsite and remote work with our technical teams being mostly back onsite on a full-time basis. We have policies and guidelines which are designed to protect the safety of our employees.

Recent Developments

2024 Rights Offering

On July 3, 2024, we closed our previously announced rights offering of up to $60,000,000 units (the "2024 Rights Offering"). In the 2024 Rights Offering, eligible stockholders subscribed to purchase 6,000,000 units, at a price of $10.00 per unit, with each unit consisting of one share of our common stock and two warrants each to purchase one half share of our common stock at an exercise price of $11.00 per whole share. Upon the closing of the 2024 Rights Offering, we issued an aggregate of 5,999,998 shares of common stock and warrants to purchase an aggregate of approximately 6,000,000 shares of common stock at an exercise price of $11.00 per whole share. We received aggregate proceeds of $60,000,000 from the 2024 Rights Offering.

Preliminary Financial Results for the Three Months Ended June 30, 2024 (unaudited)

Set forth below are certain estimated preliminary unaudited financial results and other information for the three months ended June 30, 2024. We have provided estimated ranges of these preliminary financial results below because our closing procedures for our fiscal quarter ended June 30, 2024 are not yet complete. Our final results remain subject to the completion of management's final review and our other closing procedures or subsequent events. Accordingly, you should not place undue reliance on our preliminary results set forth below, which may differ from actual results. These preliminary estimates are forward-looking statements. Our unaudited financial results as of the three months ended June 30, 2024 will not be finalized until after the date of this prospectus supplement. During the course of the preparation of our unaudited financial statements and the notes thereto by management, additional items that require adjustments to the preliminary results presented below may be identified.

The estimated preliminary financial results included in this prospectus supplement have been prepared by and are the responsibility of our management. Our independent registered public accounting firm, Deloitte & Touche LLP, has not audited, reviewed, compiled or performed any procedures with respect to this preliminary financial information and, accordingly, Deloitte & Touche LLP does not express an opinion or any other form of assurance with respect thereto. These estimates should not be viewed as a substitute for our full interim unaudited financial statements prepared in accordance with U.S. generally accepted accounting principles ("GAAP").

The following table reflects certain estimated preliminary financial results as of and for the three months ended June 30, 2024:

	Three Months ended June 30, 2024	
	Low (Estimated)	High (Estimated)
	(in millions)	
Cash and cash equivalents(1)	$ 26.0	$ 26.5
GAAP costs and expenses	11.0	13.0
GAAP net loss	(10.7)	(12.7)
Non-GAAP costs and expenses(2)	9.0	10.0
Non-GAAP net loss(2)	(8.7)	(9.7)

(1) Excludes $60.0 million in cash proceeds received by the Company in connection with the closing of the 2024 Rights Offering in July 2024.

(2) Non-GAAP costs and expenses and non-GAAP net loss are not calculated in accordance with GAAP. See "*Reconciliation of GAAP to Non-GAAP Measures*" below for a reconciliation of GAAP costs and expenses to non-GAAP costs and expenses and GAAP net loss to non-GAAP net loss, the most directly comparable financial measures calculated in accordance with GAAP.

Reconciliation of GAAP to Non-GAAP Financial Measures

To supplement our preliminary financial information presented on a GAAP basis, management has disclosed non-GAAP costs and expenses and non-GAAP net loss. We believe that an evaluation of our ongoing operations (and comparisons of our current operations with historical and future operations) would be difficult if the disclosure of our financial information were limited to financial measures prepared in accordance with GAAP. As a result, we are disclosing these non-GAAP financial measures in order to supplement investors' and other readers' understanding and assessment of our financial performance. Our management uses these measurements as aids in monitoring our ongoing financial performance from quarter to quarter, and year to year, on a regular basis and for financial and operational decision-making. Non-GAAP adjustments include stock-based compensation and depreciation and amortization. From time to time in the future, there may be other items that we may exclude if we believe that doing so is consistent with the goal of providing useful information to management and investors. We have provided a reconciliation of each non-GAAP financial measure used in this prospectus supplement to the most directly comparable GAAP financial measure. Investors are cautioned that there are a number of limitations associated with the use of non-GAAP financial measures as analytical tools. Investors are encouraged to review these reconciliations and not to rely on any single financial measure to evaluate our business. Non-GAAP financial measures used by us may be calculated differently from, and therefore may not be comparable to, similarly titled measures used by other companies, which could reduce the usefulness of our non-GAAP financial measures as tools for comparison. Investors and other readers are encouraged to review the related GAAP financial measures and the reconciliation of non-GAAP measures to their most directly comparable GAAP measures set forth below and should consider non-GAAP measures only as a supplement to, not as a substitute for or as a superior measure to, measures of financial performance prepared in accordance with GAAP. Non-GAAP financial measures in this prospectus supplement exclude the following:

- ***Non-cash expenses for stock-based compensation.*** We have excluded the effect of stock-based compensation expenses in calculating our non-GAAP costs and expenses and net loss measures. Although stock-based compensation is a key incentive offered to employees, we continue to evaluate our business performance excluding stock-based compensation expenses. We record stock-based compensation expense related to grants of time-based and performance-based options, such as options

that vest as a result of our market capitalization. Depending upon the size, timing and terms of the grants, as well as the probability of achievement of performance-based awards, this expense may vary significantly but will recur in future periods. We believe that excluding stock-based compensation better allows for comparisons from period to period.

- ***Depreciation and amortization***. We have excluded depreciation and amortization expense in calculating our non-GAAP costs and expenses and net loss measures. Depreciation and amortization are non-cash charges to current operations.

The following table reconciles preliminary GAAP costs and expenses to preliminary non-GAAP costs and expenses for the three months ended June 30, 2024:

	Three Months ended June 30, 2024	
	Low (Estimated)	High (Estimated)
	(in millions)	
GAAP costs and expenses	$ 11.0	$ 13.0
Depreciation and amortization	(0.3)	(0.3)
Stock-based compensation	(1.7)	(2.7)
Non-GAAP costs and expenses	$ 9.0	10.0

The following table reconciles preliminary GAAP net loss to preliminary non-GAAP net loss for the three months ended June 30, 2024:

	Three Months ended June 30, 2024	
	Low (Estimated)	High (Estimated)
	(in millions)	
GAAP net loss	$ (10.7)	$ (12.7)
Depreciation and amortization	0.3	0.3
Stock-based compensation	1.7	2.7
Non-GAAP net loss	$ (8.7)	$ (9.7)

Corporate Information

Pulse Biosciences, Inc., formerly Electroblate, Inc., was incorporated in the State of Nevada on May 19, 2014, and was reincorporated in the State of Delaware on June 18, 2018. Our corporate offices are located at 601 Brickell Key Drive, Suite 1000, Miami, FL 33131 and 3957 Point Eden Way, Hayward, CA 94545, and our telephone number is (510) 906-4600. We maintain a website at www.pulsebiosciences.com where general information about us is available. Our website, and the information contained therein, or that can be accessed through, our website, is not a part of this prospectus, and the inclusion of our website address is an inactive textual reference only.

THE OFFERING

Shares of common stock offered by us	Shares of our common stock having an aggregate offering price of up to $60,000,000.
Shares of common stock to be outstanding immediately after this offering	Up to 64,454,609 shares, assuming the sale of 3,229,278 shares of our common stock in this offering at an offering price of $18.58 per share, which was the last reported sale price of our common stock on Nasdaq on July 12, 2024. The actual number of shares issued will vary depending on the sales price under this offering.
Plan of distribution	"At the market offering" that may be made from time to time through or to one or both of our sales agents, the Agents. See "Plan of Distribution" for additional information.
Use of proceeds	We currently intend to use the net proceeds from this offering, if any, together with our existing cash, for general corporate purposes, including our further clinical evaluations and commercial launch of our proprietary CellFX nsPFA Percutaneous Electrode System, our ongoing investment in current and future clinical studies evaluating the safety and efficacy of our products under development, obtaining regulatory approvals for these CellFX Systems, and new product development activities. Net proceeds may be temporarily invested prior to use. See "Use of Proceeds" for additional information.
Risk factors	Any investment in the common stock offered hereby is speculative and involves a high degree of risk. You should read carefully the information set forth in "Risk Factors" in this prospectus supplement and the accompanying base prospectus, together with other information included elsewhere in this prospectus supplement, or incorporated by reference into this prospectus supplement, for a discussion of factors that you should consider before deciding to invest in our common stock.
Nasdaq Capital Market symbol	"PLSE"

The number of shares of our common stock outstanding immediately after this offering is based on 61,225,331 shares of common stock outstanding as of March 31, 2024 (which includes 5,999,998 shares of common stock issued on July 3, 2024 in connection with the closing of the 2024 Rights Offering), and excludes the following:

- 10,096,411 shares of common stock issuable upon exercise of stock options outstanding as of March 31, 2024 with a weighted-average exercise price of $9.01 per share;
- 759,258 shares of common stock reserved as of March 31, 2024, for future grants under our 2017 Equity Incentive Plan;

- 3,300,626 shares of common stock reserved as of March 31, 2024, for future grants under our 2017 Inducement Equity Incentive Plan;
- 485,359 shares of common stock reserved as of March 31, 2024, for future grants under our 2017 Employee Stock Purchase Plan; and
- approximately 6,000,000 shares of common stock issuable upon exercise of warrants issued on July 3, 2024 in connection with the closing of the Rights Offering, each with an exercise price of $11.00 per share.

Except as otherwise indicated, all information in this prospectus supplement gives effect to the issuance of 5,999,998 shares of common stock in connection with the closing of the 2024 Rights Offering and assumes no exercise of the outstanding options or warrants referred to above.

RISK FACTORS

Investing in our securities involves a high degree of risk. Before deciding whether to invest in our securities, you should carefully consider the risks and uncertainties described below and under "Risk Factors" in our most recent Annual Report on Form 10-K and any subsequent Quarterly Reports on Form 10-Q, which are incorporated herein by reference, together with the information contained in this prospectus supplement, the accompanying base prospectus and any other information that has been or will be incorporated herein or therein by reference. The occurrence of one or more of the events or circumstances described in these risk factors, alone or in combination with other events or circumstances, may have a material adverse effect on our business, reputation, revenue, financial condition, results of operations and future prospects, in which event the market price of our common stock could decline, and you could lose part or all of your investment. The risk factors are not intended to be exhaustive and are not the only ones we face. Additional risks and uncertainties not presently known to us or that we currently deem immaterial may also impair our business operations. This prospectus supplement also contains forward-looking statements that involve risks and uncertainties. Our actual results could differ materially and adversely from those anticipated in the forward-looking statements as a result of a number of factors. See "Cautionary Note Regarding Forward-Looking Statements."

Risks Related to Our Common Stock and this Offering

Our management will have broad discretion over the use of the net proceeds, if any, we receive in this offering and may not apply the proceeds in ways that increase the value of your investment, which could cause the market price of our common stock to decline.

Our management will have broad discretion to use the net proceeds, if any, payable to us from this offering and you will be relying on the judgment of our management regarding the application of these net proceeds. Our management might not apply any such net proceeds in ways that increase the value of your investment. Until we use the net proceeds, if any, payable to us from this offering, we plan to invest them, and these investments may not yield a favorable rate of return. If we do not invest or apply any net proceeds from this offering in ways that enhance stockholder value, we may fail to achieve expected financial results, which could cause the market price of our common stock to decline.

It is not possible to predict the aggregate proceeds resulting from sales made under the Equity Distribution Agreement.

Subject to certain limitations in the Equity Distribution Agreement and compliance with applicable law, we have the discretion to deliver a placement notice to an Agent at any time throughout the term of the Equity Distribution Agreement. The number of shares that are sold through the Agents after delivering a placement notice will fluctuate based on a number of factors, including the market price of our common stock during the sales period, any limits we may set with the Agents in any applicable placement notice and the demand for our common stock. Because this offering can be terminated at any time and the price per share of each share sold pursuant to the Equity Distribution Agreement will fluctuate over time, it is not currently possible to predict the aggregate proceeds to be raised in connection with sales under the Equity Distribution Agreement.

Sales of common stock offered hereby will be in "at the market offerings," and investors who buy shares at different times will likely pay different prices.

Investors who purchase shares in this offering at different times will likely pay different prices, and accordingly may experience different levels of dilution and different outcomes in their investment results. We will have discretion, subject to market demand, to vary the timing, prices and number of shares sold in this offering. In addition, subject to the final determination by our board of directors, and any restrictions we may place in any applicable placement notice delivered to the Agents, there is no minimum or maximum sales price for shares to be sold in this offering. Investors may experience a decline in the value of the shares they purchase in this offering as a result of sales made at prices lower than the prices they paid.

Future sales or issuances of our common stock in the public markets, or the perception of such sales, could depress the trading price of our common stock.

The sale of a substantial number of shares of our common stock or other equity-related securities in the public markets, or the perception that such sales could occur, could depress the market price of our common stock and impair our ability to raise capital through the sale of additional equity securities. We may sell large quantities of our common stock at any time pursuant to this prospectus supplement and/or in one or more separate offerings. We cannot predict the effect that future sales of common stock or other equity-related securities would have on the market price of our common stock.

If you purchase our common stock in this offering, you may incur immediate and substantial dilution in the book value of your shares.

The offering price per share of common stock in this offering may exceed the net tangible book value per share of our common stock outstanding prior to this offering. Therefore, if you purchase common stock in this offering, you may pay a price per share that exceeds our pro forma as adjusted net tangible book value per share of common stock. Assuming that an aggregate of 3,229,278 shares of our common stock are sold at an assumed offering price of $18.58 per share, the last reported sale price of our common stock on Nasdaq on July 12, 2024, and after deducting commissions and estimated offering expenses payable by us, you would experience immediate dilution of $16.37 per share, representing the difference between our pro forma as adjusted net tangible book value per share as of March 31, 2024, after giving effect to this offering, and the assumed offering price. To the extent outstanding options or warrants are exercised, you will experience further dilution. See the section titled “Dilution” below for a more detailed illustration of the dilution you would incur if you participate in this offering. Because the sales of the shares offered hereby will be made directly into the market, the prices at which we sell these shares will vary and these variations may be significant. Purchasers of the shares we sell, as well as our existing stockholders, will experience significant dilution if we sell shares at prices significantly below the price at which they invested.

You may experience future dilution as a result of future equity offerings.

In order to raise additional capital, we may in the future offer additional shares of our common stock or other securities convertible into or exchangeable for our common stock at prices that may not be the same as the price per share in this offering. The price per share at which we sell additional shares of our common stock, or securities convertible or exchangeable into common stock, in future transactions may be lower than the price per share paid by investors in this offering.

USE OF PROCEEDS

We may issue and sell shares of our common stock having aggregate sales proceeds of up to $60,000,000 from time to time. Because there is no minimum offering amount required as a condition to close this offering, the actual total public offering amount, commissions and proceeds to us, if any, are not determinable at this time. There can be no assurance that we will be able to sell any shares under, or fully utilize, the Equity Distribution Agreement with the Agents as a source of financing.

The principal purposes of this offering are to increase our financial flexibility and to obtain additional capital to support our operations. We currently intend to use the net proceeds from this offering, if any, together with our existing cash, for general corporate purposes, including our commercial launch of our proprietary CellFX nsPFA Percutaneous Electrode System, our ongoing investment in current and future clinical studies evaluating the safety and efficacy of our products under development, obtaining regulatory clearances for these CellFX Systems, and new product development activities. As of the date of this prospectus, we cannot specify with certainty all of the particular uses for the net proceeds to us from this offering. As a result, our management will have broad discretion regarding the timing and application of the net proceeds from this offering Pending the uses described above, we intend to invest the net proceeds in interest-bearing, investment-grade securities.

The expected use of net proceeds represents our intentions, based upon our present plans and business conditions. We cannot specify with certainty all of the particular uses for the net proceeds. Due to uncertainties inherent in the medical device development process, it is difficult to estimate the exact amounts of the net proceeds that will be used for any particular purpose. We may use our existing cash and the future payments, if any, generated from any future collaboration agreements to fund our operations, either of which may alter the amount of net proceeds used for a particular purpose. In addition, the amount, allocation and timing of our actual expenditures will depend upon numerous factors, including the results of our research and development efforts, the timing and success of our clinical trials, and the timing of our regulatory submissions. Accordingly, we will have broad discretion in using these net proceeds.

DIVIDEND POLICY

We have not declared or paid any cash dividends on our capital stock. We currently intend to retain any future earnings for use in the operation of our business and do not anticipate paying any dividends on our common stock in the foreseeable future. Any future determination to declare dividends will be made at the discretion of our board of directors and will depend on our financial condition, operating results, capital requirements, general business conditions, and other factors that our board of directors may deem relevant.

DILUTION

If you invest in our common stock in this offering, you will experience immediate and substantial dilution to the extent of the difference between the public offering price per share of our common stock, and the adjusted net tangible book value per share of our common stock immediately upon the consummation of this offering. Net tangible book value per share represents the book value of our tangible assets less the book value of our total liabilities divided by the number of shares of common stock then issued and outstanding.

Our historical net tangible book value as of March 31, 2024 was $24.4 million, or $0.44 per share of our common stock. Our historical net tangible book value is the amount of our total tangible assets less our total liabilities. Historical net tangible book value per share represents historical net tangible book value divided by 55,225,333 shares of our common stock outstanding as of March 31, 2024.

Our pro forma net tangible book value as of March 31, 2024 was $84.4 million, or $1.38 per share of our common stock, based upon 61,225,331 shares outstanding after giving effect to the issuance and sale of 5,999,998 shares of our common stock ton July 3, 2024 pursuant to the 2024 Rights Offering resulting in gross proceeds to us of $60.0 million.

After giving effect to our issuance and sale of 3,229,278 shares of our common stock in this offering at an assumed public offering price of $18.58 per share, which was the last reported sale price of our common stock on Nasdaq on July 12, 2024, and after deducting commissions and estimated offering expenses payable by us, and giving effect to the issuances of our Common Stock in the 2024 Rights Offering, our pro forma as adjusted net tangible book value as of March 31, 2024 would have been $142.4 million, or $2.21 per share. This represents an immediate increase in pro forma as adjusted net tangible book value per share of $0.83 to existing stockholders and an immediate dilution of $16.37 in pro forma as adjusted net tangible book value per share to investors purchasing common stock in this offering. Dilution per share to investors purchasing common stock in this offering is determined by subtracting pro forma as adjusted net tangible book value per share after this offering from the assumed public offering price per share paid by investors.

The following table illustrates this dilution on a per share basis:

Assumed public offering price per share		$18.58
Historical net tangible book value per share as of March 31, 2024	$0.44	
Pro forma increase in net tangible book value per share as of March 31, 2024	$0.94	
Pro forma net tangible book value per share before this offering	$1.38	
Increase in pro forma net tangible book value per share attributable to this offering	$0.83	
Pro forma as adjusted net tangible book value per share after this offering		$ 2.21
Dilution per share to investors participating in this offering		$16.37

The dilution information discussed above is illustrative only and will change based on the actual public offering price or prices if and when we sell shares of our common stock and other terms of this offering determined at pricing. A $1.00 increase in the assumed public offering price of $18.58 per share shown in the table above, assuming all of our common stock in the aggregate amount of $60,000,000 during the term of the Equity Distribution Agreement is sold as that price, would result in a pro forma as adjusted net tangible book

value per share after this offering of approximately $2.21 and dilution per share to investors participating in this offering of approximately $17.37, after deducting commissions and estimated offering expenses payable by us. A $1.00 decrease in the assumed public offering price of $18.58 per share shown in the table above, assuming all of our common stock in the aggregate amount of $60,000,000 during the term of the Equity Distribution Agreement is sold at that price, would result in a pro forma as adjusted net tangible book value per share after this offering of approximately $2.20 and dilution per share to investors participating in this offering of approximately $15.38, after deducting underwriting discounts and commissions and estimated offering expenses payable by us.

The foregoing tables and calculations (other than the historical net tangible book value calculations) are based on 61,225,331 shares of common stock outstanding as of March 31, 2024 (which includes 5,999,998 shares of common stock issued on July 3, 2024 in connection with the closing of the 2024 Rights Offering), and excludes the following:

- 10,096,411 shares of common stock issuable upon exercise of stock options outstanding as of March 31, 2024 with a weighted-average exercise price of $9.01 per share;
- 759,258 shares of common stock reserved as of March 31, 2024, for future grants under our 2017 Equity Incentive Plan;
- 3,300,626 shares of common stock reserved as of March 31, 2024, for future grants under our 2017 Inducement Equity Incentive Plan;
- 485,359 shares of common stock reserved as of March 31, 2024, for future grants under our 2017 Employee Stock Purchase Plan; and
- approximately 6,000,000 shares of common stock issuable upon exercise of warrants issued on July 3, 2024, each with an exercise price of $11.00 per share.

To the extent that any outstanding stock options and warrants described above are exercised, vested, or converted to shares of common stock at prices below the prices paid by investors participating in this offering, investors in this offering may experience further dilution. 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.

PLAN OF DISTRIBUTION

We have entered into the Equity Distribution Agreement with the Agents under which we may offer and sell our shares of common stock from time to time through the Agents acting as agents. Pursuant to this prospectus supplement, we may offer and sell up to $60,000,000 of our shares of common stock. Sales of our common stock, if any, under this prospectus supplement and the accompanying base prospectus will be made by any method that is deemed to be an "at the market offering" as defined in Rule 415(a)(4) under the Securities Act.

Each time we wish to issue and sell shares of common stock under the Equity Distribution Agreement, we will notify the Agents of the number of shares to be issued, the dates on which such sales are anticipated to be made, any limitation on the number of shares to be sold in any one day and any minimum price below which sales may not be made. Once we have so instructed the Agents, unless the Agents decline to accept the terms of such notice, the Agents have agreed to use their commercially reasonable efforts consistent with their normal trading and sales practices to sell such shares up to the amount specified on such terms. The obligations of the Agents under the Equity Distribution Agreement to sell our shares of common stock are subject to a number of conditions that we must meet.

The settlement of sales of shares between us and the applicable Agent is generally anticipated to occur on the first trading day following the date on which the sale was made. Sales of our shares of common stock as contemplated in this prospectus supplement will be settled through the facilities of The Depository Trust Company or by such other means as we and the Agents may agree upon. There is no arrangement for funds to be received in an escrow, trust or similar arrangement.

We will pay the Agents a commission of up to 3.0% of the aggregate gross proceeds we receive from each sale of our shares of common stock. Because there is no minimum offering amount required as a condition to close this offering, the actual total public offering amount, commissions and proceeds to us, if any, are not determinable at this time. In addition, we have agreed to reimburse the Agents for certain disbursements of their legal counsel in an aggregate amount not to exceed $85,000, unless we and the Agents otherwise agree. We estimate that the total expenses for the offering, excluding any commissions or ongoing expense reimbursement payable to the Agents under the terms of the Equity Distribution Agreement, will be approximately $200,000. The remaining sale proceeds, after deducting any other transaction fees, will equal our net proceeds from the sale of such shares.

The Agents will provide written confirmation to us before the open on Nasdaq on the day following each day on which our shares of common stock are sold under the Equity Distribution Agreement. Each confirmation will include the number of shares sold on that day, the aggregate gross proceeds of such sales and the proceeds to us.

In connection with the sale of our shares of common stock on our behalf, the Agents will be deemed to be "underwriters" within the meaning of the Securities Act, and the compensation of the Agents will be deemed to be underwriting commissions or discounts. We have agreed to indemnify the Agents against certain civil liabilities, including liabilities under the Securities Act. We have also agreed to contribute to payments the Agents may be required to make in respect of such liabilities.

The offering of our shares of common stock pursuant to the Equity Distribution Agreement will terminate as permitted therein.

This summary of the material provisions of the Equity Distribution Agreement does not purport to be a complete statement of its terms and conditions. A copy of the Equity Distribution Agreement will be filed as an exhibit on Form 8-K and incorporated by reference to the registration statement of which this prospectus supplement forms a part.

The Agents and their affiliates may in the future provide, various investment banking, commercial banking, financial advisory and other financial services for us and our affiliates, for which services they may in the future receive customary fees. In the course of their business, the Agents may actively trade our securities for their own accounts or for the accounts of customers, and, accordingly, the Agents may at any time hold long or short positions in such securities.

A prospectus supplement and the accompanying base prospectus in electronic format may be made available on a website maintained by the Agents, and the Agents may distribute the prospectus supplement and the accompanying base prospectus electronically.

Broadridge Corporate Issuer Solutions, LLC is the transfer agent and registrar for our common stock. Our common stock is listed on Nasdaq under the symbol “PLSE.”

LEGAL MATTERS

The validity of the securities offered pursuant to this prospectus supplement will be passed upon by Baker & Hostetler LLP. Certain legal matters in connection with this offering will be passed upon for the Agents by Goodwin Procter LLP.

EXPERTS

The consolidated financial statements of Pulse Biosciences, Inc. as of December 31, 2023 and 2022, and for each of the two years in the period ended December 31, 2023, incorporated by reference in this prospectus by reference to Pulse Bioscience, Inc.'s annual report on Form 10-K for the year ended December 31, 2023, have been audited by Deloitte & Touche LLP, an independent registered public accounting firm, as stated in their report. Such consolidated financial statements are incorporated by reference in reliance upon the report of such firm given their authority as experts in accounting and auditing.

WHERE YOU CAN FIND MORE INFORMATION

We have filed with the SEC a registration statement on Form S-3, including exhibits, under the Securities Act, with respect to the securities offered pursuant to this prospectus supplement. This prospectus supplement is part of the registration statement, but does not contain all of the information included in the registration statement or the exhibits. For further information with respect to us and the securities offered by this prospectus supplement, we refer you to the registration statement and its exhibits. Statements contained in this prospectus supplement as to the contents of any contract or any other document referred to are not necessarily complete, and in each instance, we refer you to the copy of the contract or other document filed as an exhibit to the registration statement. Each of these statements is qualified in all respects by this reference.

In addition, we file annual, quarterly and current reports, proxy statements and other information with the SEC. The SEC maintains an internet site that contains reports, proxy and information statements, and other information regarding issuers that file electronically with the SEC, including our SEC filings, located at *https://www.sec.gov*. We also maintain a website at *https://www.pulsebiosciences.com*. The information contained in or accessible from our website is not incorporated into this prospectus supplement, and you should not consider it part of this prospectus supplement. We have included our website address in this prospectus supplement solely as an inactive textual reference. You may access, free of charge, 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 as soon as reasonably practicable after such material is electronically filed with, or furnished to, the SEC.

INFORMATION INCORPORATED BY REFERENCE

The SEC allows us to "incorporate by reference" information into this prospectus supplement, which means that we can disclose important information to you by referring you to another document filed separately with the SEC. The information incorporated by reference is deemed to be part of this prospectus supplement, and subsequent information that we file with the SEC will automatically update and supersede that information. Any statement contained in this prospectus supplement or a previously filed document incorporated by reference will be deemed to be modified or superseded for purposes of this prospectus supplement to the extent that a statement contained in this prospectus supplement or a subsequently filed document incorporated by reference modifies or replaces that statement.

This prospectus supplement incorporates by reference the documents set forth below that have previously been filed with the SEC:

- our Annual Report on Form 10-K for the year ended December 31, 2023, filed with the SEC on March 28, 2023;
- our Quarterly Report on Form 10-Q for the quarter ended March 31, 2024, filed with the SEC on May 7, 2024;
- our Current Reports on Form 8-K filed with the SEC on March 28, 2024, May 2, 2024, May 9, 2024, May 15, 2024, May 20, 2024, June 7, 2024, June 28, 2024, July 3, 2024, and July 8, 2024; and
- The description of our common stock contained in the Registration Statement on Form 8-A relating thereto, filed on April 15, 2016, including any amendment or report filed for the purpose of updating such description.

All reports and other documents we subsequently file pursuant to Section 13(a), 13(c), 14 or 15(d) of the Exchange Act prior to the termination of this offering, but excluding any information furnished to, rather than filed with, the SEC, will also be incorporated by reference into this prospectus supplement and deemed to be part of this prospectus supplement from the date of the filing of such reports and other documents.

We will provide to each person, including any beneficial owner, to whom a prospectus supplement is delivered, a copy of any or all of the information that has been incorporated by reference in the prospectus but not delivered with the prospectus. You may request a copy of any documents incorporated by reference in this prospectus supplement and the accompanying base prospectus, at no cost, by writing or telephoning us at:

Pulse Biosciences, Inc.
601 Brickell Key Drive, Suite 1000
Miami, FL 33131
Attention: Investor Relations
Telephone: 510-906-4600

Exhibits to the filings will not be sent, however, unless those exhibits have been specifically incorporated by reference in this prospectus supplement.

Table of Contents

PROSPECTUS

Pulse Biosciences, Inc.

$50,000,000
Common Stock
Preferred Stock
Debt Securities
Depositary Shares
Warrants
Subscription Rights
Purchase Contracts
Units

This prospectus provides a general description of the common stock, preferred stock, debt securities, depositary shares, warrants, subscription rights, purchase contracts, and units that we may offer from time to time.

Each time we offer and sell securities, we will file a supplement to this prospectus that contains specific information about the offering and the amounts, prices, and terms of the securities. Each supplement may also add, update, or change information contained in this prospectus with respect to that offering. You should carefully read this prospectus and the applicable prospectus supplement before you invest in any of our securities.

We may offer and sell these securities to or through one or more agents, underwriters, dealers, or other third parties, "at the market," to or through a market maker, into an existing trading market, or otherwise directly to one or more purchasers on a continuous or delayed basis or through a combination of methods of sale. If agents, underwriters, or dealers are used to sell our securities, we will name them and describe their compensation in a prospectus supplement. The price to the public of our securities and the net proceeds from the sale of such securities will also be set forth in a prospectus supplement. You should carefully read this prospectus and any accompanying prospectus supplement, together with the documents we incorporate by reference, before you invest in our securities. The aggregate offering price of the securities we sell pursuant to this prospectus will not exceed $50,000,000.

Our common stock is listed on the Nasdaq Capital Market under the symbol "PLSE." On March 27, 2024, the last reported sales price of our common stock was $8.40.

Investing in our securities involves a high degree of risk. See "Risk Factors" beginning on page 14 of this prospectus and page 11 of our Annual Report on Form 10-K for the year ended December 31, 2023, incorporated by this reference herein, as well as the other information contained in this prospectus and the documents incorporated by reference in this prospectus, or in any accompanying prospectus supplement for a discussion of the factors you should carefully consider before making a decision to invest in our securities.

You should rely only on the information contained in this prospectus or any prospectus supplement or amendment hereto. We have not authorized anyone to provide you with different information.

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

The date of this prospectus is April 8, 2024.

TABLE OF CONTENTS

ABOUT THIS PROSPECTUS

This prospectus is part of a registration statement on Form S-3 that we filed with the SEC using the "shelf" registration process. Under this shelf registration process, we may, from time to time, sell any combination of the securities described in this prospectus in one or more offerings.

The types of securities that we may offer and sell from time to time by this prospectus are:

- common stock;
- preferred stock;
- debt securities, which may be senior or subordinated and secured or unsecured;
- depositary shares;
- warrants entitling the holders to purchase common stock, preferred stock or debt securities;
- subscription rights entitling the holders to purchase common stock, preferred stock, warrants, or debt securities;
- purchase contracts; and
- units.

We may sell these securities either separately or in units. The preferred stock may be convertible into shares of our common stock or another series of preferred stock. This prospectus provides a general description of the securities that may be offered. Each time we sell securities, we will provide a supplement to this prospectus that contains specific information about the offering and the specific terms of the securities being offered.

You should rely only on the information provided in this prospectus, as well as the information incorporated by reference into this prospectus and any applicable prospectus supplement. We have not authorized anyone to provide you with different or additional information or to make any representations other than those contained in this prospectus or any applicable prospectus supplement. We do not take responsibility for, and can provide no assurance as to the reliability of, any other information that others may give you. You should not assume that the information in this prospectus or any applicable prospectus supplement is accurate as of any date other than the date of the applicable document. Since the date of this prospectus and the documents incorporated by reference into this prospectus, our business, financial condition, results of operations, and prospects may have changed. We will not make an offer to sell these securities in any jurisdiction where the offer or sale is not permitted.

We may also provide a prospectus supplement or post-effective amendment to the registration statement to add information to, or update or change information contained in, this prospectus. You should read both this prospectus and any applicable prospectus supplement or post-effective amendment to the registration statement together with the information incorporated by reference herein or therein. For general information about the distribution of securities offered, please see "*Plan of Distribution*," below. You should read both this prospectus and any prospectus supplement, together with the additional information described in "*Information Incorporated by Reference*" and "*Where You Can Find More Information*," before you make any investment decisions regarding the securities. You may obtain the information incorporated by reference into this prospectus without charge by following the instructions under "*Information Incorporated by Reference*" and "*Where You Can Find More Information*," below.

This prospectus summarizes certain documents and other information, and we refer you to them for a more complete understanding of what we discuss in this prospectus. All of the summaries are qualified in their entirety by the actual documents. In making an investment decision, you must rely on your own examination of our Company and the terms of the offering and the securities, including the merits and risks involved.

We are not making any representation to any purchasers of our securities regarding the legality of an investment in our securities by such purchasers. You should not consider any information in this prospectus to be legal, business or tax advice. You should consult your own attorney, business advisor or tax advisor for legal, business and tax advice regarding an investment in our securities.

Unless the context indicates otherwise, references in this prospectus to the "Company," "Pulse," "Pulse Biosciences," "we," "us," "our," and similar terms refer to Pulse Biosciences, Inc., a Delaware corporation, and its consolidated subsidiaries.

CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS

Some of the statements made under "Prospectus Summary," "Use of Proceeds," and elsewhere in this prospectus, as well as the documents incorporated by reference herein, including in our Annual Report on Form 10-K for the fiscal year ended December 31, 2023, constitute forward-looking statements within the meaning of The Private Securities Litigation Reform Act of 1995. In some cases, you can identify forward-looking statements by terminology such as "may," "will," "should," "expects," "plans," "anticipates," "believes," "estimates," "predicts," "potential," "intends," or "continue," or the negative of these terms or other comparable terminology.

These forward-looking statements may include, but are not limited to, statements related to our expected business, new product introductions, results of clinical studies, expectations regarding regulatory clearance and the timing of FDA or non-US filings or approvals including meetings with FDA or non-U.S. regulatory bodies, procedures and procedure adoption, future results of operations, future financial position, our ability to generate revenues, our financing plans and future capital requirements, anticipated costs of revenue, anticipated expenses, the effect of recent accounting pronouncements, our anticipated cash flows, our ability to finance operations from cash flows or otherwise, and statements based on current expectations, estimates, forecasts, and projections about the economies and markets in which we operate and intend to operate and our beliefs and assumptions regarding these economies and markets.

Forward-looking statements are not guarantees of future performance and are subject to risks and uncertainties. We have based these forward-looking statements on assumptions and assessments made by our management in light of their experience and their perception of historical trends, current conditions, expected future developments, and other factors they believe to be appropriate.

Important factors that could cause actual results, developments and business decisions to differ materially from those anticipated in these forward-looking statements include, among others, those factors referred to in our Annual Report on Form 10-K for the fiscal year ended December 31, 2023, which is incorporated by reference herein.

These statements are only current predictions and are subject to known and unknown risks, uncertainties, and other factors that may cause our or our industry's actual results, levels of activity, performance, or achievements to be materially different from those anticipated by the forward-looking statements. We discuss many of these risks in the documents incorporated by reference herein. 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 future results, levels of activity, performance, or achievements. Except as required by law, we are under no duty to update or revise any of the forward-looking statements, whether as a result of new information, future events or otherwise, after the date of this prospectus.

PROSPECTUS SUMMARY

This summary highlights certain information about us and selected information contained in the prospectus. This summary is not complete and does not contain all of the information that may be important to you. For a more complete understanding of the Company, we encourage you to read and consider the more detailed information included or incorporated by reference in this prospectus and our most recent consolidated financial statements and related notes.

Overview

Pulse Biosciences, Inc. is a novel bioelectric medicine company committed to health innovation using its patented Nano-Pulse Stimulation ("NPS") technology, a revolutionary energy modality that delivers nanosecond-duration pulses of electrical energy, each less than a millionth of a second long, to non-thermally clear targeted cells while sparing adjacent noncellular tissue. NPS technology, also referred to as Nanosecond Pulsed-Field Ablation ("nsPFA") technology when used to ablate cellular tissue, can be used to treat a variety of medical conditions for which an optimal solution remains unfulfilled. The Company developed its proprietary CellFX System, a novel nsPFA delivery platform, and commercialized the initial application of its nsPFA technology to treat benign lesions of the skin. In parallel, the Company has designed a variety of applicators, or end-effectors, to explore the potential use of the CellFX platform to treat disorders in other medical specialties, such as cardiology, gastroenterology, gynecology, and ear, nose and throat. These applicators include devices for open surgical procedures, endoscopic or minimally invasive procedures, and endoluminal catheters, and each has been used in preclinical studies. Based on our preclinical experience and the potential to significantly improve outcomes for patients in a large and growing market, the Company decided in 2022 to focus its primary efforts on the use of nsPFA energy and the CellFX platform in the treatment of atrial fibrillation ("AF").

Our Cardiac Program

AF is a type of heart arrythmia, or irregular heartbeat, caused by faulty electrical signals in the heart. AF is a highly prevalent condition and is growing significantly with an ageing population. It is estimated that 43 million people worldwide are affected by AF. Treatment requires the precise and safe ablation of heart tissue to block or otherwise prevent these faulty electrical signals from causing the irregular heartbeat, and we believe nsPFA technology is uniquely suited to perform an integral role for this application and that it will prove to be highly differentiated from standard thermal energy modalities in use today. The Company has developed a cardiac ablation clamp for use in cardiac surgery and a cardiac ablation catheter for use in electrophysiology. In December 2023, we initiated a clinical study in Prague to test our CellFX nsPFA 360° Cardiac Catheter in patients with AF and early acute data and remapping data from this study have been promising. More recently, we have taken steps to initiate a clinical study of our CellFX nsPFA Cardiac Clamp in the Netherlands and, in January 2024, we filed a premarket notification 510(k) with the U.S. Food and Drug Administration (the "FDA") for clearance to commercialize our novel CellFX nsPFA Cardiac Clamp in the United States. In parallel, we have taken initial steps towards a CE mark approval in Europe for the cardiac clamp. The results of preclinical testing of both cardiac products have exceeded our expectations and much of the data have been published or presented at physician or industry conferences. While these devices serve different physicians, the application of the energy to safely and effectively ablate cardiac tissue and the treatment of AF are the same, and we believe there will be important synergies realized through their contemporaneous development. The Company's cardiac ablation clamp and cardiac ablation catheter both use the CellFX System to generate our proprietary pulses of electrical energy.

CellFX nsPFA Cardiac Clamp

Our surgical cardiac ablation clamp is designed for use by cardiac surgeons during the surgical treatment of AF. The standard of care surgical procedure for the treatment of AF is performed by cardiac surgeons and called

the Cox-Maze procedure. The Cox-Maze procedure typically uses thermal ablation technologies, such as heat with radiofrequency ablation or cold with cryoablation, to create specific ablation lines in the heart muscle. The ablation lines block the conduction of electrical impulses and can cure the patient of their atrial fibrillation.

We believe our CellFX nsPFA technology can provide important advantages over today's thermal modalities in creating these ablation lines. For example, surgeons using the CellFX System should be able to deliver faster ablations through thicker tissue than thermal modalities because of the nonthermal mechanism of action that nsPFA employs, which is not affected by heatsinks such as the blood in the heart. In preclinical studies, our CellFX nsPFA Cardiac Clamp has consistently achieved transmural ablations in 1.25 seconds, independent of tissue type or thickness. Moreover, thermal modalities are also known to have problems with char formation on electrode surfaces which can cause gaps in the ablation lines leading to treatment failure and require the char to be scraped off by the surgeon during the procedure. Again, this should not be an issue with CellFX nsPFA ablation given its nonthermal nature. Also, because nsPFA ablation does not impact acellular tissue, such as collagen or cartilage, our technology has the potential to offer significant safety advantages over thermal modalities by allowing surgeons to ablate near and into vessels and valves without concern of permanent damage. And finally, nsPFA ablation has been shown to spare nerves of any permanent damage, even when treated directly, which is another concern for thermal modalities. We believe these advantages will be important to cardiac surgeons, so we are working with leaders in the field to develop this technology quickly. In May 2023, we appointed Dr. Gan Dunnington as our Chief Medical Officer, Cardiac Surgery. Dr. Dunnington is a cardiothoracic surgeon and the Director of Cardiothoracic Surgery at St. Helena Hospital (Napa Valley). He specializes in minimally invasive complex cardiothoracic procedures for the treatment of AF. And, in October 2023, we appointed Dr. Niv Ad as our Chief Science Officer, Cardiac Surgery. Dr. Ad specializes in the surgical treatment of atrial fibrillation, minimally invasive heart surgery and other advanced heart surgery techniques and transcatheter therapies.

Over the last several years, we have been developing the cardiac ablation clamp from proof-of-concept to prototype, and we now have what we believe is our initial commercial design. The device was designed with the input of key physicians in cardiac surgery, and we believe it will offer a highly differentiated option relative to the standard of care thermal modalities. Since 2023, we have been meeting with the FDA to discuss the regulatory requirements for a potential 510(k) clearance or other approval to market our cardiac clamp in the United States. In 2023, with guidance from the FDA, we completed a preclinical study, known as a Good Laboratory Practices or "GLP" study and, in January 2024, we filed a premarket notification 510(k) with the FDA for our novel CellFX nsPFA Cardiac Clamp.

CellFX nsPFA 360° Cardiac Catheter

We believe our cardiac catheter ablation device will have many of the same advantages that the cardiac ablation clamp appears to have with respect to both performance and safety compared to standard thermal modalities. Our catheter is uniquely designed to provide a circumferential, or circular, ablation in a single treatment cycle. We believe this will enable faster treatment times compared to what is currently performed with thermal modalities, especially when ablating around the pulmonary veins, a common treatment approach for AF.

In recent years, Pulsed Field Ablation ("PFA") has gained attention in electrophysiology for the treatment of AF because of its safety profile and potential to improve efficacy. PFA differs from CellFX nsPFA technology in that the pulse widths are longer, typically in the 10's to 100's of microseconds. We believe CellFX nsPFA can offer similar safety advantages as PFA and may provide improved efficacy advantages based on the circumferential design of our catheter and because it appears CellFX nsPFA technology can create deeper ablations. Another potential advantage of nsPFA ablation is a much shorter pulse duration which appears to stimulate less muscle contraction than does millisecond or microsecond PFA.

Similar to the cardiac ablation clamp, our proprietary catheter has been in development for several years and we have been working with leaders in the electrophysiology field to test the catheter in preclinical studies. After seeing encouraging preclinical results, in December 2023, we initiated a clinical study in Prague to test our CellFX nsPFA 360° Cardiac Catheter in patients with AF and early acute data and remapping data from this study have been promising. In the United States, we believe the catheter will need to go through the FDA's Pre-Market Approval ("PMA") process for FDA approval to market and sell our cardiac catheter in the United States.

CellFX nsPFA Percutaneous Electrode System

Since early 2023, we have made tremendous progress in our percutaneous electrode program. After years of pre-clinical development and testing, as a supplemental point of validation of the Company's engineering capabilities, and to demonstrate our technology's unique mechanism of action on internal organs, in June 2023 we initiated a first-in-human study using our novel and proprietary nsPFA-enabled surgical end-effector, our percutaneous electrode. This study is being conducted by Professor Stefano Spiezia at the Ospedale del Mare in Naples, Italy, to help us better understand and confirm the mechanism of action and tissue response of nsPFA energy in internal organs as we advance into human cardiac tissue. Initially, ten subjects were treated and evaluated in the study. All of the initial patients in the study tolerated the procedure well with no reported pain or serious side effects. Ultrasound imaging 90 days post procedure showed that the treated portions of the nodules had been completely resorbed with no sign of scarring or fibrosis, which can be a side effect of other ablation modalities. Based on these positive initial results, in November 2023, we amended the thyroid study protocol to expand enrollment to focus on optimizing treatment parameters.

In parallel, in November 2023, we filed a premarket notification 510(k) with the FDA for clearance to commercialize our novel CellFX nsPFA Percutaneous Electrode System in the United States. In March 2024, the Company received FDA 510(k) clearance for its CellFX nsPFA Percutaneous Electrode System for use in the ablation of soft tissue in percutaneous and intraoperative surgical procedures.

Having secured regulatory approval to market and sell the CellFX nsPFA Percutaneous Electrode System in the United States, we have initiated a limited market release, targeting a handful of select accounts.

The CellFX Console

The CellFX Console is a tunable, software-enabled, console-based platform, designed to accommodate the clinical workflow preferred by physicians. The CellFX System is configured to accept a variety of end-effectors or electrodes across a range of clinical applications. In February 2021, the Company received 510(k) clearance from the FDA for the CellFX System for dermatologic procedures requiring ablation and resurfacing of the skin. In January 2021, the Company received Conformité Européene ("CE") marking approval for the CellFX System, which allows for marketing of the system in the European Union ("EU"). Shortly after these regulatory clearances the Company began commercializing the CellFX System in dermatology for the treatment of benign skin lesions. However, in September 2022, the Company announced a shift in its focus from dermatology to cardiology and the treatment of AF. The Company has ceased all commercial sales and marketing operations in dermatology. At the present time, we continue to support our remaining commercial users and remain open to a potential commercial partnership. The CellFX System is being used for our current efforts in the treatment of AF and as part of the CellFX nsPFA Percutaneous Electrode System.

We continue to believe nsPFA ablation, as well as NPS technology more broadly has the potential to provide superior outcomes across a variety of medical disciplines and we may seek partnership opportunities to develop additional applications.

Intellectual Property

We maintain a portfolio of intellectual property surrounding our CellFX System and our NPS technology platform. As a medical technology company, our current patents and ongoing intellectual property development are, and will continue to be, a priority for our business. We believe our intellectual property is an important competitive advantage for us. We also rely on trade secrets, know-how, continuing technological innovations, and licensing opportunities to further develop, maintain, and strengthen our competitive position. We actively protect our intellectual property through a combination of patent registrations, trademarks, and copyright protections; confidentiality agreements with our employees, consultants, and other parties; and access control to sensitive information.

Today, on a worldwide basis, we own 197 issued patents and pending patent applications, and we have an exclusive license to 69 additional issued patents and pending patent applications. The vast majority of our granted patents have an expiration date between 2035 and 2042. As in the past, we plan to continue to file new patent applications to protect our systems, algorithms, applicators, methods, and designs of our technologies and products as they evolve. Medical technologies such as ours may be utilized in many different applications and incorporate several patentable features, and our strategy will be to always strive to protect our products and technologies with multiple patents directed to the variety of features and applications, in order to establish a strong and useful patent portfolio against competitors, such that an expiration of a single patent should not lessen our overall comprehensive coverage and competitive advantage. We believe our NPS platform and CellFX System are protected by several issued patents, as well as pending applications.

Employees and Human Capital

As of December 31, 2023, we had 56 employees, of which substantially all were located at our headquarters in Hayward, California. Of these employees, half were engaged in research and development activities and half were engaged in operations, marketing, business development, and general and administrative activities.

Talent Acquisition and Development. We are committed to providing a respectful work environment to our diverse workforce. We provide equal employment opportunities to all persons regardless of race, age, color, gender, sexual orientation, national origin, physical or mental disability, religion, or any other characteristic protected by federal, state, or local law.

We believe our employees are essential to our success and our ability to attract, develop, and retain key talent is a vital part of that. Our philosophy is to both develop talent from within and to strategically recruit key external talent. Our overall talent acquisition and retention strategy is designed to attract and retain diverse and qualified candidates to enable the success of the Company and achievement of our performance goals. The skills, experience and industry knowledge of key employees significantly benefit our operations and performance.

Compensation and Benefits Program. Our compensation program is designed to attract, motivate, and retain talented individuals who possess the skills necessary to support our business and contribute to our strategic goals, creating long-term value for our stockholders. We provide employees with competitive compensation packages that include base salary, annual incentive bonuses, 401(k), and equity awards tied to the value of our stock price. Our comprehensive benefits package also includes medical, dental, vision, life and disability plans, and an employee assistance program.

Wellness and Safety. The health and safety of our employees is of utmost importance to us. We currently operate under a hybrid model of onsite and remote work with our technical teams being mostly onsite on a full-time basis. We have policies and guidelines which are designed to protect the safety of our employees.

Competition

The applications we intend to target are subject to intense competition from rapidly evolving companies and new scientific discoveries. We compete against well-established incumbent technologies offering products in cardiology, oncology, and dermatology, as well as in minimally invasive procedures. For example, Abbott Laboratories, AtriCure, Inc., Boston Scientific Corporation, Johnson & Johnson (Biosense Webster), Medtronic plc, and several other companies all sell ablation-based surgical and catheter-based medical devices for the treatment of heart arrhythmias, including AF, and additionally, many of these companies are also actively developing PFA products for the treatment of AF. All of these companies currently have greater financial, technical, research, and/or other resources than we do and have larger and more established manufacturing capabilities and marketing, sales, and support functions. Our future success will depend on our ability to establish and maintain a competitive position in current and future technologies. Our technology is unique and differentiated in that NPS technology can influence many cellular functions depending on the energy applied. When it is used to stimulate primarily regulated cell death, such as through nsPFA ablation, we believe it will be less traumatic to treated tissue and result in less scarring or collateral damage to surrounding tissues, which we feel will give us a competitive advantage over these more established companies despite formidable competition.

Government Regulation

The CellFX System is a medical device subject to extensive and ongoing regulation by the FDA under the Federal Food, Drug, and Cosmetic Act and its implementing regulations, as well as other federal and state regulatory bodies in the United States. These laws and regulations govern, among other things, product design and development, preclinical and clinical testing, manufacturing, packaging, labeling, storage, recordkeeping and reporting, clearance or approval, marketing, distribution, promotion, import and export, and post-marketing surveillance.

The FDA regulates the medical device market to ensure the safety and efficacy of our products. For medical devices that require pre-market review, the FDA allows for three clearance/approval pathways for a medical device to be commercialized: approval via a Pre-market Approval Application ("PMA"), clearance of a 510(k) submission, or submission of a de novo application. The FDA has established three different classes of medical devices, based on the level of risk associated with using a device and consequent degree of regulatory controls needed to govern its safety and efficacy, as well as the appropriate clearance/approval pathway needed to obtain authorization to legally market a medical device in the United States.

Class I and Class II devices are considered low and moderate risk devices. Most Class I devices are exempt from premarket notification. Most Class II devices require 510(k) clearance from the FDA in order to be marketed in the U.S. A 510(k) Premarket Notification is a premarket submission made to the FDA to demonstrate that the device to be marketed is substantially equivalent to a legally marketed Class II device, *i.e.,* a predicate device. Companies making a 510(k) submission must compare their 510(k)-candidate device to a predicate device and establish substantial equivalence to the satisfaction of FDA. A device previously cleared under 510(k) or a device approved through a de novo application can be used as a predicate device for later developed substantially equivalent medical devices. However, establishing substantial equivalence in a 510(k) submission requires the candidate device to have the same intended use and the same technological characteristics as a predicate device. The FDA has a 90-calendar day review goal from the date of receipt of the 510(k) to either authorize or decline commercial distribution of the device, but clearance generally takes longer than 90 days. During the review process, the FDA may also request additional information which extends the review process. If the FDA decides that the product is not substantially equivalent to a predicate device, a clearance will not be granted, and the device cannot be commercialized. If a 510(k) submission is rejected by FDA, the applicant may be required to seek premarket authorization through the de novo pathway or the premarket approval pathway, which are more costly and will generally take longer for FDA approval.

Medical devices regarded as the highest risk by the FDA are typically designated Class III and generally require the submission of a PMA application for approval. Class III devices generally include life-sustaining, life-supporting, or implantable devices or devices without a known predicate technology already approved by the FDA. A PMA application must be accompanied by substantial data that supports the reasonable safety and efficacy of the device, which includes the provision of preclinical, clinical, technical, manufacturing, and labeling information. After the FDA determines the application is sufficiently complete to commence a substantive review, it has 180 days to review the submission, but it can typically take longer (up to several years) as this regulatory body can request additional data, including clinical data or clarifications. The FDA may also impose additional regulatory scrutiny for a PMA, including the institution of an outside advisory committee (panel review) to assess the application or provide recommendations as to whether to approve the device. Although the FDA is not required to follow the recommendation of an advisory panel, it generally does. As part of the review, the FDA will also inspect the manufacturing operations of the Company requesting approval to verify compliance with Quality System regulations.

If a new medical device does not qualify for the 510(k) premarket notification process because no predicate device to which it is substantially equivalent can be identified, the device is automatically classified into Class III. The Food and Drug Administration Modernization Act of 1997 established a new route to market for low to moderate risk medical devices that are automatically placed into Class III due to the absence of a predicate device, called the "Request for Evaluation of Automatic Class III Designation," or the de novo classification process. This process allows a manufacturer whose novel device is automatically classified into Class III to request down-classification of its medical device into Class I or Class II on the basis that the device presents low or moderate risk, rather than requiring the submission and approval of a PMA. If the manufacturer seeks reclassification into Class II, the manufacturer must include a draft proposal for special controls that are necessary to provide a reasonable assurance of the safety and efficacy of the medical device. The FDA may reject the reclassification petition if it identifies a legally marketed predicate device that would be appropriate for a 510(k) or determines that the device is not low to moderate risk and requires PMA or that general controls would be inadequate to control the risks and special controls cannot be developed.

After a device receives 510(k) clearance or PMA approval, any modification that could significantly affect its safety or effectiveness, or that would constitute a major change in its intended use, will require a new 510(k) clearance or PMA Supplemental approval. The FDA requires each manufacturer to make this determination initially, but the FDA can review any such decision and can disagree with a manufacturer's determination. If the FDA disagrees with the determination not to seek a new 510(k) clearance or PMA Supplement, the FDA may retroactively require a new 510(k) clearance or PMA Supplements to be submitted. The FDA could also require a manufacturer to cease marketing and distribution and/or recall the modified device until clearance or approval is obtained. Also, in these circumstances, the manufacturer may be subject to significant regulatory fines, penalties, and possible warning letters.

Pervasive and Continuing Regulation

Even after a device is placed on the market with FDA clearance or approval, numerous regulatory requirements continue to apply. These include:

- the FDA's Quality System Regulation ("QSR") which requires manufacturers, including third-party manufacturers, to follow stringent design, testing, control, documentation, and other quality assurance procedures during all aspects of the manufacturing process;
- labeling regulations and FDA and FTC prohibitions against the promotion of products for uncleared, unapproved, or off-label uses;

- medical device reporting regulations, which require that manufacturers report to the FDA if their device may have caused or contributed to a death or serious injury or malfunctioned in a way that would likely cause or contribute to a death or serious injury if the malfunction were to recur; and
- post-market surveillance regulations, which apply when necessary to protect the public health or to provide additional safety and efficacy data for the device.

The FDA has broad post-market and regulatory enforcement powers, and we must comply with the post-market surveillance regulations, including medical device reporting regulations. We are required to report to the FDA information if a device has, or may have, caused or contributed to a death or serious injury or has malfunctioned in a way that would likely cause or contribute to death or serious injury, if the malfunction of the device or one of our similar devices were to recur. If we fail to report events required to be reported to the FDA within the required timeframes, or at all, the FDA could take enforcement action and impose sanctions against us. Any such adverse event involving our products also could result in future voluntary corrective actions, such as recalls or customer notifications, or agency action, such as inspection or enforcement action. Any corrective action, whether voluntary or involuntary, as well as defending ourselves in a lawsuit, would require our time and capital, distract management from operating our business, and may harm our reputation and have a material adverse effect on our business, financial condition, and results of operations.

We may be subject to unannounced inspections by the FDA and the Food and Drug Branch of the California Department of Public Health to determine our compliance with the QSR and other regulations, and these inspections may include the manufacturing facilities of our suppliers.

Failure to comply with applicable regulatory requirements can result in enforcement action by the FDA, which may include any of the following sanctions:

- warning letters, fines, injunctions, consent decrees, and civil penalties;
- repair, replacement, refunds, recall, or seizure of our products;
- operating restrictions, partial suspension, or total shutdown of production;
- refusing our requests for 510(k) clearance or premarket approval of new products, new intended uses, or modifications to existing products;
- withdrawing 510(k) clearance or premarket approval that has already been granted; and
- criminal prosecution.

Regulatory System for Medical Devices in Europe

The European Union (the "EU") consists of 27-member states and has a coordinated system for the authorization of medical devices. Marketing medical devices in the EU is subject to compliance with the Medical Devices Directive 93/92/EEC (MDD) and the European Union Medical Device Regulation (2017/745 or EU MDR) following its entry into application on May 26, 2020. A medical device may be placed on the market within the EU only if it conforms to certain "essential requirements" and bears the CE Mark. The most fundamental and essential requirement is that a medical device must be designed and manufactured in such a way that it will not compromise the clinical condition or safety of patients, or the safety and health of users and others. In addition, the device must achieve the essential performance(s) intended by the manufacturer and be designed, manufactured, and packaged in a suitable manner.

Manufacturers must demonstrate that their devices conform to the relevant essential requirements through a conformity assessment procedure. The nature of the assessment depends upon the classification of the device.

The classification rules are mainly based on three criteria: (i) the length of time the device is in contact with the body, (ii) the degree of invasiveness, and (iii) the extent to which the device affects the anatomy. Conformity assessment procedures for all but the lowest risk classification of device involve a notified body. Notified bodies are often private entities and are authorized or licensed to perform such assessments by government authorities. Manufacturers usually have some flexibility to select a notified body for the conformity assessment procedures for a particular class of device and to reflect their circumstances, *e.g.*, the likelihood that the manufacturer will make frequent modifications to its products. Conformity assessment procedures require an assessment of available clinical evidence, literature data for the product, and post-market experience in respect of similar products already marketed. Notified bodies also may review the manufacturer's quality systems. If satisfied that the product conforms to the relevant essential requirements, the notified body issues a certificate of conformity, which the manufacturer uses as a basis for its own declaration of conformity and application of the CE Mark. Application of the CE Mark allows the general commercializing of a product in the EU. The product can also be subjected to local registration requirements depending on the country.

The EU MDR, which repealed and replaced the MDD, entered into force on May 25, 2017 with a transition period extending until May 26, 2021. The EU MDR clearly envisages, among other things, stricter controls of medical devices, including strengthening of the conformity assessment procedures, increased expectations with respect to clinical data for devices, and pre-market regulatory review of high-risk devices. The EU MDR also envisages greater control over notified bodies and their standards, increased transparency, more robust device vigilance requirements, and clarification of the rules for clinical investigations. Under transitional provisions, medical devices with notified body certificates issued under the MDD prior to May 26, 2020, and which have not been significantly changed, may continue to be placed on the market for the remaining validity of the certificate, until December 2028 at the latest. After the expiry of any applicable transitional period, only devices that have been CE marked under the EU MDR may be placed on the market in the EU.

Environmental

We are subject to federal, state, and local laws, rules, regulations, and policies governing the use, generation, manufacture, storage, air emission, effluent discharge, handling, and disposal of certain hazardous and potentially hazardous substances used in connection with our operations. Although we believe that we have complied with these laws and regulations in all material respects and, to date, have not been required to take any action to correct any noncompliance, there can be no assurance that we will not be required to incur significant costs to comply with environmental regulations in the future.

Insurance

We maintain product and clinical trial liability insurance coverage which includes a maximum of per claim and annual aggregate policy limits, subject to self-insured retentions. The policy covers, subject to policy conditions and exclusions, claims of bodily injury and property damage from any product manufactured by us or from trial-related adverse events.

There is no assurance that our level of coverage is adequate. We may not be able to sustain or maintain our current level of coverage and cannot assure you that adequate insurance coverage will continue to be available on commercially reasonable terms, or at all. A successful product liability claim may exceed our existing coverages and may make future coverages significantly more expensive, if available at all.

In May 2023, the Company secured director and officer liability insurance from third-party insurance carriers through a brokered transaction.

Corporate Information

Pulse Biosciences, Inc., formerly Electroblate, Inc., was incorporated in the State of Nevada on May 19, 2014, and was reincorporated in the State of Delaware on June 18, 2018. Our corporate offices are located at 3957 Point Eden Way, Hayward, California 94545, and our telephone number is (510) 906-4600. We maintain a website at www.pulsebiosciences.com where general information about us is available. Our website, and the information contained therein, or that can be accessed through, our website, is not a part of this prospectus, and the inclusion of our website address is an inactive textual reference only.

The Securities That May Be Offered

We may offer or sell common stock, preferred stock, debt securities, depositary shares, warrants, subscription rights, purchase contracts, and units in one or more offerings and in any combination. The aggregate offering price of the securities we sell pursuant to this prospectus will not exceed $50,000,000. Each time securities are offered with this prospectus, we will provide a prospectus supplement that will describe the specific amounts, prices and terms of the securities being offered and the net proceeds we expect to receive from that sale.

The securities may be sold from time to time pursuant to underwritten public offerings, negotiated transactions, block trades, "at the market" offerings into an existing trading market, subscription rights offering, or a combination of these methods, to or through underwriters, dealers or agents or directly to purchasers or as otherwise set forth in the section of this prospectus captioned "*Plan of Distribution*" or in any applicable prospectus supplement. Each prospectus supplement will set forth the names of any underwriters, dealers, agents or other entities involved in the sale of securities described in that prospectus supplement and any applicable fee, commission or discount arrangements with them.

Common Stock

We may offer shares of our common stock, par value $0.001 per share, either alone or underlying other registered securities convertible into our common stock. Holders of our common stock are entitled to receive dividends declared by our board of directors out of assets or funds legally available for the payment of dividends, subject to rights, if any, of preferred stockholders. The holders of common stock have no preemptive rights.

Preferred Stock

Our board of directors has the authority, subject to limitations prescribed by Delaware law and our restated certificate of incorporation, to issue up to 50,000,000 shares of preferred stock in one or more series, to establish from time to time the number of shares to be included in each series, and to fix the designation, powers, preferences and rights of the shares of each series and any of its qualifications, limitations or restrictions, in each case without further vote or action by our stockholders. Each series of preferred stock offered by us will be more fully described in the particular prospectus supplement that will accompany this prospectus, including redemption provisions, rights in the event of our liquidation, dissolution or winding up, voting rights and rights to convert into common stock.

Debt Securities

We may offer one or more series of senior or subordinated debt. The senior debt securities and the subordinated debt securities are together referred to in this prospectus as the "debt securities." The debt securities may be issued in one or more series with the same or various maturities at par, at premium or at a discount. Unless otherwise specified in a prospectus supplement, the debt securities will be our direct, unsecured

obligations. The subordinated debt securities generally will be entitled to payment only after payment of our senior debt. Senior debt generally includes all debt for money borrowed by us, except debt that is stated in the instrument governing the terms of that debt not to be senior to, or to have the same rank in right of payment as, or to be expressly junior to, the subordinated debt securities. We may issue debt securities that are convertible into shares of our common stock.

The debt securities will be issued under an indenture between us and a trustee to be identified in an accompanying prospectus supplement. We have summarized the general features of the debt securities to be governed by the form of indenture in this prospectus and the form of indenture has been filed as an exhibit to the registration statement of which this prospectus forms a part. We encourage you to read the indenture.

Depositary Shares

We may issue fractional shares of preferred stock that will be represented by depositary shares and depositary receipts. Each series of depositary shares or depositary receipts offered by us will be more fully described in the particular prospectus supplement that will accompany this prospectus, including redemption provisions, rights in the event of our liquidation, dissolution or winding up, voting rights and rights to convert into common stock.

Warrants

We may offer warrants for the purchase of common stock, preferred stock or debt securities. We may offer warrants independently or together with other securities.

Subscription Rights

We may offer subscription rights to purchase our common stock, preferred stock, warrants or debt securities, or units consisting of some or all of these securities. These subscription rights may be offered independently or together with any other security offered hereby and may or may not be transferable by the stockholder receiving the subscription rights in such offering.

Purchase Contracts

We may offer purchase contracts, including contracts obligating holders or us to purchase from the other a specific or variable number of securities at a future date or dates.

Units

We may offer units comprised of one or more of the other classes of securities described in this prospectus in any combination. Each unit will be issued so that the holder of the unit is also the holder of each security included in the unit.

RISK FACTORS

You should carefully consider the risk factors affecting the Company's business which are discussed in the section entitled "Risk Factors" in the Company's Annual Report on Form 10-K for the year ended December 31, 2023 (the "Annual Report"), that we have filed or will file with the SEC, and in other documents which are incorporated by reference into this prospectus, including all future filings we make with the SEC pursuant to Sections 13(a), 13(c), 14, or 15(d) of the Exchange Act, as well as the risk factors and other information contained in or incorporated by reference into any accompanying prospectus supplement before investing in any of our securities. The risks referenced above are not the only risks facing our Company. Additional risk and uncertainties not currently known to us or that we currently deem to be immaterial also may materially adversely affect our business, financial condition and/or operating results.

For more information about our SEC filings, please see "*Where You Can Find More Information*" and "*Incorporation of Certain Information by Reference*."

USE OF PROCEEDS

Unless otherwise specified in a prospectus supplement accompanying this prospectus, the net proceeds from the sale by us of the securities to which this prospectus relates will be used for general corporate purposes. Net proceeds may be temporarily invested prior to use. When we offer and sell the securities to which this prospectus relates, the prospectus supplement related to such offering will set forth our intended use of the proceeds, if any, received from the sale of such securities.

DESCRIPTION OF CAPITAL STOCK

The following description of our common stock is a summary and is qualified in its entirety by reference to our restated certificate of incorporation, as amended ("Certificate of Incorporation") and amended and restated bylaws ("Bylaws"), copies of which have been filed with the SEC and are incorporated by reference as exhibits to the registration statement of which this prospectus forms a part, and by applicable law.

General

As of the date of this prospectus, our authorized capital stock consists of 500,000,000 shares of common stock, par value $0.001 per share and 50,000,000 shares of preferred stock, par value $0.001 per share. As of December 31, 2023, we had 55,144,374 shares of our common stock issued and outstanding.

Common Stock

Voting Rights. Each holder of common stock is entitled to one vote for each share held of record on all matters to be voted upon by stockholders. The common stock does not have cumulative voting rights.

Dividends. Subject to the preferences that may be applicable to any preferred stock outstanding at the time, the holders of outstanding shares of our common stock are entitled to receive such dividends as may be declared from time to time by the board of directors out of funds legally available therefor.

Liquidation, Dissolution and Winding Up. Subject to the rights, powers and preferences of any outstanding preferred stock, in the event of liquidation, dissolution or winding up of the company to holders of outstanding shares of our common stock are entitled to share ratably in all assets remaining after payment of liabilities and the liquidation preference of any then outstanding shares of preferred stock.

Other Rights. Holders of common stock have no preemptive or conversion rights. There are no redemption or sinking fund provisions applicable to the common stock.

Preferred Stock

Our board of directors is authorized, subject to limitations prescribed by Delaware law, to issue up to 50,000,000 shares of preferred stock in one or more series without stockholder approval. Our board of directors may designate the powers, designations, preferences, and relative participation, optional or other rights, if any, and the qualifications, limitations or restrictions of the shares of each series of preferred stock, including dividend rights, conversion rights, voting rights, redemption rights, liquidation preference, sinking fund terms and the number of shares constituting any series or the designation or any series. The rights, preferences, rights and restrictions of the preferred stock of each series will be fixed by the certificate of designation relating to that series. There are no restrictions presently on the repurchase or redemption of any shares of our preferred stock.

A series of our preferred stock could, depending on the terms of such series, impede the completion of a merger, tender offer or other takeover attempt. Our board of directors will make any determination to issue preferred shares based upon its judgment as to the best interests of our stockholders. Our directors, in so acting, could issue preferred stock having terms that could discourage an acquisition attempt through which an acquirer may be able to change the composition of our board of directors, including a tender offer or other transaction that some, or a majority, of our stockholders might believe to be in their best interests or in which stockholders might receive a premium for their stock over the then-current market price of the stock.

The issuance of shares of preferred stock will affect, and may adversely affect, the rights of holders of common stock. It is not possible to state the actual effect of the issuance of any shares of preferred stock on the rights of holders of common stock until our board of directors determines the specific rights attached to that preferred stock. The effects of issuing additional preferred stock could include one or more of the following:

- restricting dividends on the common stock;

- diluting the voting power of the common stock;
- impairing the liquidation rights of the common stock;
- delaying or preventing changes in control or management of our company.

Certain Provisions of Our Certificate of Incorporation and Bylaws and Delaware Law

Some provisions of Delaware law and our certificate of incorporation and bylaws contain provisions that could make the following transactions more difficult:

- acquisition of us by means of a tender offer;
- acquisition of us by means of a proxy contest or otherwise; or
- removal of our incumbent officers and directors.

Those provisions, summarized below, are expected to discourage coercive takeover practices and inadequate takeover bids and to promote stability in our management. These provisions are also designed to encourage persons seeking to acquire control of us to first negotiate with our board of directors.

Certificate of Incorporation and Bylaws

Our certificate of incorporation and our bylaws provide for the following:

Stockholder Meetings. Our bylaws provide that in general a special meeting of stockholders may be called only by our board of directors, the chairman of our board of directors, any of our officers, or any stockholder holding at least fifteen percent (15%) of the voting power of the capital stock issued and outstanding and entitled to vote.

Requirements for Advance Notification of Stockholder Nominations and Proposals. Our bylaws establish advance notice procedures with respect to stockholder proposals and the nomination of candidates for election as directors, other than nominations made by or at the direction of our board of directors or a committee of the board of directors.

Limits on Ability of Stockholders to Act by Written Consent. We have provided in our bylaws that our stockholders may not act by written consent. This limit on the ability of our stockholders to act by written consent may lengthen the amount of time required to take stockholder actions. As a result, a holder controlling a majority of our capital stock would not be able to amend our bylaws or remove directors without holding a meeting of our stockholders called in accordance with our bylaws.

Amendment of Certificate of Incorporation and Bylaws. The amendment of the above provisions of our certificate of incorporation and bylaws requires approval by holders of at least two-thirds of our outstanding capital stock entitled to vote generally in the election of directors.

Delaware Anti-Takeover Statute

We are subject to the provisions of Section 203 of the Delaware General Corporation Law regulating corporate takeovers. In general, Section 203 prohibits a publicly-held Delaware corporation from engaging, under certain circumstances, 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, (i) shares owned by persons who are directors and also officers, and (ii) 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.

Generally, 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 15% or more of a corporation's outstanding voting stock or is an affiliate or associate of a corporation and was the owner of 15% or more of the corporation's outstanding voting stock within three years prior to the determination of interested stockholder status.

Choice of Forum

Our bylaws provide that unless we consent in writing to the selection of an alternative forum, the Court of Chancery of the State of Delaware shall, to the fullest extent permitted by law, be the sole and exclusive forum for (a) any derivative action or proceeding brought on our behalf, (b) any action asserting a claim of breach of fiduciary duty owed by any our directors, officers or other employees to us or our stockholders, (c) any action asserting a claim arising pursuant to any provision of the Delaware General Corporation Law, our certificate of incorporation or our bylaws, or (d) any action asserting a claim governed by the internal affairs doctrine, in each case subject to the Court of Chancery having personal jurisdiction over the indispensable parties named as defendants therein; provided that, if and only if the Court of Chancery dismisses any such action for lack of subject matter jurisdiction, such action may be brought in another state or federal court sitting in Delaware. Our bylaws further provide that the federal district courts of the United States of America will be the exclusive forum for resolving any complaint asserting a cause of action arising under the Securities Act.

Transfer Agent and Registrar

The transfer agent and registrar for our common stock is Broadridge Corporate Issuer Solutions, Inc.

Listing

Our common stock is listed on the Nasdaq Capital Market under the symbol "PLSE."

DESCRIPTION OF DEBT SECURITIES

The following description, together with the additional information we include in any applicable prospectus supplement, summarizes certain general terms and provisions of the debt securities that we may offer under this prospectus. When we offer to sell a particular series of debt securities, we will describe the specific terms of the series in a supplement to this prospectus. We will indicate in the supplement to what extent the general terms and provisions described in this prospectus apply to a particular series of debt securities.

We may issue debt securities either separately, or together with, or upon the conversion or exercise of or in exchange for, other securities described in this prospectus. Debt securities may be our senior or subordinated obligations and, unless otherwise specified in a supplement to this prospectus, the debt securities will be our direct, unsecured obligations and may be issued in one or more series. We may issue debt securities that are convertible into shares of our common stock.

The debt securities will be issued under an indenture between us and a trustee to be specified in an accompanying prospectus supplement. We have summarized select portions of the indenture below. The summary is not complete. The form of the indenture has been filed as an exhibit to the registration statement of which this prospectus forms a part and you should read the indenture for provisions that may be important to you. Capitalized terms used in the summary and not defined herein have the meanings specified in the indenture.

General

The terms of each series of debt securities will be established by or pursuant to a resolution of our board of directors and set forth or determined in the manner provided in a resolution of our board of directors, in an officer's certificate, or by a supplemental indenture. The particular terms of each series of debt securities will be described in a prospectus supplement relating to such series (including any pricing supplement or term sheet). In addition, any changes to the description below also will be set forth in the applicable prospectus supplement.

We can issue an unlimited amount of debt securities under the indenture that may be in one or more series with the same or various maturities, at par, at a premium, or at a discount. We will set forth in a prospectus supplement (including any pricing supplement or term sheet) relating to any series of debt securities being offered the aggregate principal amount and the following terms of the debt securities, if applicable:

- the title and ranking of the debt securities (including the terms of any subordination provisions);
- the price or prices (expressed as a percentage of the principal amount) at which we will sell the debt securities;
- any limit upon the aggregate principal amount of the debt securities;
- the date or dates on which the principal of the securities of the series is payable;
- the rate or rates (which may be fixed or variable) per annum or the method used to determine the rate or rates (including any commodity, commodity index, stock exchange index or financial index) at which the debt securities will bear interest, the date or dates from which interest will accrue, the date or dates on which interest will commence and be payable and any regular record date for the interest payable on any interest payment date;
- the place or places where principal of, and interest, if any, on the debt securities will be payable (and the method of such payment), where the securities of such series may be surrendered for registration of transfer or exchange, and where notices and demands to us in respect of the debt securities may be delivered;
- the period or periods within which, the price or prices at which and the terms and conditions upon which we may redeem the debt securities;

- any obligation we have to redeem or purchase the debt securities pursuant to any sinking fund or analogous provisions or at the option of a holder of debt securities and the period or periods within which, the price or prices at which and the terms and conditions upon which securities of the series shall be redeemed or purchased, in whole or in part, pursuant to such obligation;
- the dates on which and the price or prices at which we will repurchase debt securities at the option of the holders of debt securities and other detailed terms and provisions of these repurchase obligations;
- the denominations in which the debt securities will be issued, if other than denominations of $1,000 and any integral multiple thereof;
- whether the debt securities will be issued in the form of certificated debt securities or global debt securities;
- the portion of principal amount of the debt securities payable upon declaration of acceleration of the maturity date, if other than the principal amount;
- the currency of denomination of the debt securities, which may be United States dollars or any foreign currency, and if such currency of denomination is a composite currency, the agency or organization, if any, responsible for overseeing such composite currency;
- the designation of the currency, currencies or currency units in which payment of principal of, and premium and interest on the debt securities will be made;
- if payments of principal of, or premium or interest on the debt securities will be made in one or more currencies or currency units other than those in which the debt securities are denominated, the manner in which the exchange rate with respect to these payments will be determined;
- the manner in which the amounts of payment of principal of, and premium, if any, or interest on the debt securities will be determined, if these amounts may be determined by reference to an index based on a currency or currencies or by reference to a commodity, commodity index, stock exchange index or financial index;
- any provisions relating to any security provided for the debt securities;
- any addition to, deletion of or change in the Events of Default described in this prospectus or in the indenture with respect to the debt securities and any change in the acceleration provisions described in this prospectus or in the indenture with respect to the debt securities;
- any addition to, deletion of or change in the covenants described in this prospectus or in the indenture with respect to the debt securities;
- any depositaries, interest rate calculation agents, exchange rate calculation agents or other agents with respect to the debt securities;
- any other terms of the debt securities, which may supplement, modify or delete any provision of the indenture as it applies to that series, including any terms that may be required under applicable law or regulations or advisable in connection with the marketing of the securities; and
- whether any of our direct or indirect subsidiaries will guarantee the debt securities of that series, including the terms of subordination, if any, of such guarantees.

We may issue debt securities that provide for an amount less than their stated principal amount to be due and payable upon declaration of acceleration of their maturity pursuant to the terms of the indenture. We will provide you with information on the federal income tax considerations and other special considerations applicable to any of these debt securities in the applicable prospectus supplement.

If we denominate the purchase price of any of the debt securities in a foreign currency or currencies or a foreign currency unit or units, or if the principal of and any premium and interest on any series of debt securities

is payable in a foreign currency or currencies or a foreign currency unit or units, we will provide you with information on the restrictions, elections, general tax considerations, specific terms and other information with respect to that issue of debt securities and such foreign currency or currencies or foreign currency unit or units in the applicable prospectus supplement.

Transfer and Exchange

Each debt security will be represented by either one or more global securities registered in the name of a clearing agency registered under the Exchange Act, which we refer to as the depositary, or a nominee of the depositary (we will refer to any debt security represented by a global debt security as a "book-entry debt security"), or a certificate issued in definitive registered form (we will refer to any debt security represented by a certificated security as a "certificated debt security") as set forth in the applicable prospectus supplement. Except as set forth under the heading "Global Debt Securities and Book-Entry System" below, book-entry debt securities will not be issuable in certificated form.

Certificated Debt Securities

You may transfer or exchange certificated debt securities at any office we maintain for this purpose in accordance with the terms of the indenture. No service charge will be made for any transfer or exchange of certificated debt securities, but we may require payment of a sum sufficient to cover any tax or other governmental charge payable in connection with a transfer or exchange.

You may effect the transfer of certificated debt securities and the right to receive the principal of, and premium and interest on certificated debt securities only by surrendering the certificate representing those certificated debt securities and either reissuance by us or the trustee of the certificate to the new holder or the issuance by us or the trustee of a new certificate to the new holder.

Global Debt Securities and Book-Entry System

Each global debt security representing book-entry debt securities will be deposited with, or on behalf of, the depositary, and registered in the name of the depositary or a nominee of the depositary.

Covenants

We will set forth in the applicable prospectus supplement any restrictive covenants applicable to any issue of debt securities.

Consolidation, Merger and Sale of Assets

We may not consolidate with or merge with or into, or convey, transfer or lease all or substantially all of our properties and assets to any person, which we refer to as a successor person, unless:

- we are the surviving corporation or the successor person (if other than us) is a corporation organized and validly existing under the laws of any U.S. domestic jurisdiction and expressly assumes our obligations on the debt securities and under the indenture; and
- immediately after giving effect to the transaction, no Default or Event of Default, shall have occurred and be continuing.

Notwithstanding the above, any of our subsidiaries may consolidate with, merge into or transfer all or part of its assets or properties to us.

Events of Default

"Event of Default" means with respect to any series of debt securities, any of the following:

- default in the payment of any interest upon any debt security of that series when it becomes due and payable, and continuance of such default for a period of 30 days (unless the entire amount of the payment is deposited by us with the trustee or with a paying agent prior to the expiration of the 30-day period);
- default in the payment of principal of any security of that series at its maturity;
- default in the performance or breach of any other covenant or warranty by us in the indenture (other than a covenant or warranty that has been included in the indenture solely for the benefit of a series of debt securities other than that series), which default continues uncured for a period of 60 days after we receive written notice from the trustee, or we and the trustee receive written notice from the holders of not less than 25% in principal amount of the outstanding debt securities of that series as provided in the indenture;
- certain voluntary or involuntary events of bankruptcy, insolvency or reorganization of us; and
- any other Event of Default provided with respect to debt securities of that series that is described in the applicable prospectus supplement.

No Event of Default with respect to a particular series of debt securities (except as to certain events of bankruptcy, insolvency or reorganization) necessarily constitutes an Event of Default with respect to any other series of debt securities. The occurrence of certain Events of Default or an acceleration under the indenture may constitute an event of default under certain indebtedness of ours or our subsidiaries outstanding from time to time.

We will provide the trustee written notice of any Default or Event of Default within 30 days of becoming aware of the occurrence of such Default or Event of Default, which notice will describe in reasonable detail the status of such Default or Event of Default and what action we are taking or propose to take in respect thereof.

If an Event of Default with respect to debt securities of any series at the time outstanding occurs and is continuing, then the trustee or the holders of not less than 25% in principal amount of the outstanding debt securities of that series may, by a notice in writing to us (and to the trustee if given by the holders), declare to be due and payable immediately the principal of (or, if the debt securities of that series are discount securities, that portion of the principal amount as may be specified in the terms of that series) and accrued and unpaid interest, if any, on all debt securities of that series. In the case of an Event of Default resulting from certain events of bankruptcy, insolvency or reorganization, the principal (or such specified amount) of and accrued and unpaid interest, if any, on all outstanding debt securities will become and be immediately due and payable without any declaration or other act on the part of the trustee or any holder of outstanding debt securities. At any time after a declaration of acceleration with respect to debt securities of any series has been made, but before a judgment or decree for payment of the money due has been obtained by the trustee, the holders of a majority in principal amount of the outstanding debt securities of that series may rescind and annul the acceleration if all Events of Default, other than the non-payment of accelerated principal and interest, if any, with respect to debt securities of that series, have been cured or waived as provided in the indenture. We refer you to the prospectus supplement relating to any series of debt securities that are discount securities for the particular provisions relating to acceleration of a portion of the principal amount of such discount securities upon the occurrence of an Event of Default.

The indenture provides that the trustee may refuse to perform any duty or exercise any of its rights or powers under the indenture unless the trustee receives indemnity satisfactory to it against any cost, liability or expense which might be incurred by it in performing such duty or exercising such right or power. Subject to certain rights of the trustee, the holders of a majority in principal amount of the outstanding debt securities of any

series will have the right to direct the time, method and place of conducting any proceeding for any remedy available to the trustee or exercising any trust or power conferred on the trustee with respect to the debt securities of that series.

No holder of any debt security of any series will have any right to institute any proceeding, judicial or otherwise, with respect to the indenture or for the appointment of a receiver or trustee, or for any remedy under the indenture, unless:

- that holder has previously given to the trustee written notice of a continuing Event of Default with respect to debt securities of that series; and
- the holders of not less than 25% in principal amount of the outstanding debt securities of that series have made written request, and offered indemnity or security satisfactory to the trustee, to the trustee to institute the proceeding as trustee, and the trustee has not received from the holders of not less than a majority in principal amount of the outstanding debt securities of that series a direction inconsistent with that request and has failed to institute the proceeding within 60 days.

Notwithstanding any other provision in the indenture, the holder of any debt security will have an absolute and unconditional right to receive payment of the principal of, and premium and any interest on that debt security on or after the due dates expressed in that debt security and to institute suit for the enforcement of payment.

The indenture requires us, within 120 days after the end of our fiscal year, to furnish to the trustee a statement as to compliance with the indenture. If a Default or Event of Default occurs and is continuing with respect to the securities of any series and if it is known to a responsible officer of the trustee, the trustee shall send to each securityholder of the securities of that series notice of a Default or Event of Default within 90 days after it occurs or, if later, after a responsible officer of the trustee has knowledge of such Default or Event of Default. The indenture provides that the trustee may withhold notice to the holders of debt securities of any series of any Default or Event of Default (except in payment on any debt securities of that series) with respect to debt securities of that series if the trustee determines in good faith that withholding notice is in the interest of the holders of those debt securities.

Modification and Waiver

We and the trustee may modify, amend or supplement the indenture or the debt securities of any series without the consent of any holder of any debt security:

- to cure any ambiguity, defect or inconsistency;
- to comply with covenants in the indenture described above under the heading “Consolidation, Merger and Sale of Assets”;
- to provide for uncertificated securities in addition to or in place of certificated securities;
- to add guarantees with respect to debt securities of any series or secure debt securities of any series;
- to surrender any of our rights or powers under the indenture;
- to add covenants or events of default for the benefit of the holders of debt securities of any series;
- to comply with the applicable procedures of the applicable depositary;
- to make any change that does not adversely affect the rights of any holder of debt securities;
- to provide for the issuance of and establish the form and terms and conditions of debt securities of any series as permitted by the indenture;
- to effect the appointment of a successor trustee with respect to the debt securities of any series and to add to or change any of the provisions of the indenture to provide for or facilitate administration by more than one trustee;

- to comply with requirements of the SEC in order to effect or maintain the qualification of the indenture under the Trust Indenture Act;
- to add to, change or eliminate any provision of the indenture or the debt securities of any series in accordance with the Trust Indenture Act, or to comply with the provisions of DTC, Euroclear or Clearstream or the Trustee with respect to provisions of the indenture or the debt securities of any series relating to transfers or exchanges of the debt securities of such series or beneficial interests in such securities; or
- to conform any provision of the indenture, insofar as it relates to the debt securities of any series, to the description of the debt securities of such series in the prospectus supplement relating to the offering of the debt securities of such series.

We may modify and amend the indenture with the consent of the holders of at least a majority in principal amount of the outstanding debt securities of each series affected by the modifications or amendments. We may not make any modification or amendment without the consent of the holders of each affected debt security then outstanding if that amendment will:

- reduce the amount of debt securities whose holders must consent to an amendment, supplement or waiver;
- reduce the rate of or extend the time for payment of interest (including default interest) on any debt security;
- reduce the principal of or premium on or change the fixed maturity of any debt security or reduce the amount of, or postpone the date fixed for, the payment of any sinking fund or analogous obligation with respect to any series of debt securities;
- reduce the principal amount of discount securities payable upon acceleration of maturity;
- waive a default in the payment of the principal of, or premium or interest on any debt security (except a rescission of acceleration of the debt securities of any series by the holders of at least a majority in aggregate principal amount of the then outstanding debt securities of that series and a waiver of the payment default that resulted from such acceleration);
- make the principal of or premium or interest on any debt security payable in currency other than that stated in the debt security;
- make any change to certain provisions of the indenture relating to, among other things, the right of holders of debt securities to receive payment of the principal of, or premium and interest on those debt securities and to institute suit for the enforcement of any such payment; or
- waive a redemption payment with respect to any debt security.

Except for certain specified provisions, the holders of at least a majority in principal amount of the outstanding debt securities of any series, may on behalf of the holders of all debt securities of that series, waive our compliance with provisions of the indenture. The holders of a majority in principal amount of the outstanding debt securities of any series, may on behalf of the holders of all the debt securities of such series, waive any past default under the indenture with respect to that series and its consequences, except a default in the payment of the principal of, premium or any interest on any debt security of that series; provided, however, that the holders of a majority in principal amount of the outstanding debt securities of any series may rescind an acceleration and its consequences, including any related payment default that resulted from the acceleration.

Defeasance of Debt Securities and Certain Covenants in Certain Circumstances

Legal Defeasance

The indenture provides that, unless otherwise provided by the terms of the applicable series of debt securities, we may be discharged from any and all obligations in respect of the debt securities of any series

(subject to certain exceptions). We will be so discharged upon the irrevocable deposit with the trustee, in trust, of money and/or U.S. government obligations or, in the case of debt securities denominated in a single currency other than U.S. dollars, government obligations that issued or caused to be issued such currency, that, through the payment of interest and principal in accordance with their terms, will provide money or U.S. government obligations in an amount sufficient in the opinion of a nationally recognized firm of independent public accountants or investment bank to pay and discharge each installment of principal, premium and interest on and any mandatory sinking fund payments in respect of the debt securities of that series on the stated maturity of those payments in accordance with the terms of the indenture and those debt securities.

This discharge may occur only if, among other things, we have delivered to the trustee an opinion of counsel stating that we have received from, or there has been published by, the United States Internal Revenue Service a ruling or, since the date of execution of the indenture, there has been a change in the applicable United States federal income tax law, in either case to the effect that, and based thereon, such opinion shall confirm that, the holders of the debt securities of that series will not recognize income, gain or loss for United States federal income tax purposes as a result of the deposit, defeasance and discharge and will be subject to United States federal income tax on the same amounts and in the same manner and at the same times as would have been the case if the deposit, defeasance and discharge had not occurred.

Defeasance of Certain Covenants

The indenture provides that, unless otherwise provided by the terms of the applicable series of debt securities, upon compliance with certain conditions:

- we may omit to comply with the covenant described under the heading “Consolidation, Merger and Sale of Assets” and certain other covenants set forth in the indenture, as well as any additional covenants which may be set forth in the applicable prospectus supplement; and
- any omission to comply with those covenants will not constitute a Default or an Event of Default with respect to the debt securities of that series.

We refer to this as covenant defeasance. The conditions include:

- depositing with the trustee money and/or U.S. government obligations or, in the case of debt securities denominated in a single currency other than U.S. dollars, government obligations of the government that issued or caused to be issued such currency, that, through the payment of interest and principal in accordance with their terms, will provide money in an amount sufficient in the opinion of a nationally recognized firm of independent public accountants or investment bank to pay and discharge each installment of principal of, premium and interest on and any mandatory sinking fund payments in respect of the debt securities of that series on the stated maturity of those payments in accordance with the terms of the indenture and those debt securities;
- such deposit will not result in a breach or violation of, or constitute a default under the indenture or any other agreement to which we are a party;
- no Default or Event of Default with respect to the applicable series of debt securities shall have occurred or is continuing on the date of such deposit; and
- delivering to the trustee an opinion of counsel to the effect that we have received from, or there has been published by, the United States Internal Revenue Service a ruling or, since the date of execution of the indenture, there has been a change in the applicable United States federal income tax law, in either case to the effect that, and based thereon such opinion shall confirm that, the holders of the debt securities of that series will not recognize income, gain or loss for United States federal income tax purposes as a result of the deposit and related covenant defeasance and will be subject to United States federal income tax on the same amounts and in the same manner and at the same times as would have been the case if the deposit and related covenant defeasance had not occurred.

No Personal Liability of Directors, Officers, Employees or Stockholders

None of our past, present or future directors, officers, employees or stockholders, as such, will have any liability for any of our obligations under the debt securities or the indenture or for any claim based on, or in respect or by reason of, such obligations or their creation. By accepting a debt security, each holder waives and releases all such liability. This waiver and release is part of the consideration for the issue of the debt securities. However, this waiver and release may not be effective to waive liabilities under U.S. federal securities laws, and it is the view of the SEC that such a waiver is against public policy.

Governing Law

The indenture and the debt securities, including any claim or controversy arising out of or relating to the indenture or the securities, will be governed by the laws of the State of New York.

The indenture will provide that we, the trustee and the holders of the debt securities (by their acceptance of the debt securities) irrevocably waive, to the fullest extent permitted by applicable law, any and all right to trial by jury in any legal proceeding arising out of or relating to the indenture, the debt securities or the transactions contemplated thereby.

The indenture will provide that any legal suit, action or proceeding arising out of or based upon the indenture or the transactions contemplated thereby may be instituted in the federal courts of the United States of America located in the City of New York or the courts of the State of New York, in each case located in the City of New York, and we, the trustee and the holder of the debt securities (by their acceptance of the debt securities) irrevocably submit to the non-exclusive jurisdiction of such courts in any such suit, action or proceeding. The indenture will provide that service of any process, summons, notice or document by mail (to the extent allowed under any applicable statute or rule of court) to such party's address set forth in the indenture will be effective service of process for any suit, action or other proceeding brought in any such court. The indenture will provide that we, the trustee and the holders of the debt securities (by their acceptance of the debt securities) irrevocably and unconditionally waive any objection to the laying of venue of any suit, action or other proceeding in the courts specified above and irrevocably and unconditionally waive and agree not to plead or claim any such suit, action or other proceeding has been brought in an inconvenient forum.

DESCRIPTION OF DEPOSITARY SHARES

General

We may, at our option, elect to offer fractional shares of preferred stock, or depositary shares, rather than full shares of preferred stock. If we do, we will issue to the public receipts, called depositary receipts, for depositary shares, each of which will represent a fraction of a share of a particular series of preferred stock, to be described in the applicable prospectus supplement. Unless otherwise provided in the prospectus supplement, each owner of a depositary share will be entitled to all the rights and preferences of the preferred stock represented by the depositary share, in proportion to the applicable fractional interest in a share of preferred stock represented by the depositary share. Those rights include dividend, voting, redemption, conversion, and liquidation rights.

The shares of preferred stock underlying the depositary shares will be deposited with a bank or trust company selected by us to act as depositary under a deposit agreement between us, the depositary and the holders of the depositary receipts. The depositary will be the transfer agent, registrar and dividend disbursing agent for the depositary shares.

The depositary shares will be evidenced by depositary receipts issued pursuant to the depositary agreement. Holders of depositary receipts agree to be bound by the deposit agreement, which will require holders to take certain actions such as filing proof of residence and paying certain charges.

The summary of terms of the depositary shares contained in this prospectus is not complete. You should refer to the form of the deposit agreement, our Certificate of Incorporation and the certificate of designation for the applicable series of preferred stock that are, or will be, filed with the SEC.

Dividends and Other Distributions

The depositary will distribute all cash dividends or other cash distributions, if any, received in respect of the preferred stock underlying the depositary shares to the record holders of depositary shares in proportion to the number of depositary shares owned by those holders on the relevant record date. The relevant record date for depositary shares will be the same date as the record date for the underlying preferred stock.

If there is a distribution other than in cash, the depositary will distribute property (including securities) received by it to the record holders of depositary shares, unless the depositary determines that it is not feasible to make the distribution. If this occurs, with our approval, the depositary may adopt another method for the distribution, including selling the property and distributing the net proceeds from the sale to the holders.

Liquidation Preference

If a series of preferred stock underlying the depositary shares has a liquidation preference, in the event of the voluntary or involuntary liquidation, dissolution or winding up of the Company, holders of depositary shares will be entitled to receive the fraction of the liquidation preference accorded each share of the applicable series of preferred stock, as set forth in the applicable prospectus supplement.

Withdrawal of Stock

Unless the related depositary shares have been previously called for redemption, upon surrender of the depositary receipts at the office of the depositary, the holder of the depositary shares will be entitled to delivery, at the office of the depositary to or upon his or her order, of the number of whole shares of the preferred stock and any money or other property represented by the depositary shares. If the depositary receipts delivered by the holder evidence a number of depositary shares in excess of the number of depositary shares representing the number of whole shares of preferred stock to be withdrawn, the depositary will deliver to the holder, at the same

time, a new depositary receipt evidencing the excess number of depositary shares. In no event will the depositary deliver fractional shares of preferred stock upon surrender of depositary receipts. Holders of preferred stock so withdrawn may not thereafter deposit those shares under the deposit agreement or receive depositary receipts evidencing depositary shares therefor.

Redemption of Depositary Shares

Whenever we redeem shares of preferred stock held by the depositary, the depositary will redeem as of the same redemption date the number of depositary shares representing shares of the preferred stock so redeemed, so long as we have paid in full to the depositary the redemption price of the preferred stock to be redeemed plus an amount equal to any accumulated and unpaid dividends on the preferred stock to the date fixed for redemption. The redemption price per depositary share will be equal to the redemption price and any other amounts per share payable on the preferred stock multiplied by the fraction of a share of preferred stock represented by one depositary share. If less than all the depositary shares are to be redeemed, the depositary shares to be redeemed will be selected by lot or pro rata or by any other equitable method as may be determined by the depositary.

After the date fixed for redemption, depositary shares called for redemption will no longer be deemed to be outstanding and all rights of the holders of depositary shares will cease, except the right to receive the monies payable upon redemption and any money or other property to which the holders of the depositary shares were entitled upon redemption upon surrender to the depositary of the depositary receipts evidencing the depositary shares.

Voting the Preferred Stock

Upon receipt of notice of any meeting at which the holders of the preferred stock are entitled to vote, the depositary will mail the information contained in the notice of meeting to the record holders of the depositary receipts relating to that preferred stock. The record date for the depositary receipts relating to the preferred stock will be the same date as the record date for the preferred stock. Each record holder of the depositary shares on the record date will be entitled to instruct the depositary as to the exercise of the voting rights pertaining to the number of shares of preferred stock represented by that holder's depositary shares. The depositary will endeavor, insofar as practicable, to vote the number of shares of preferred stock represented by the depositary shares in accordance with those instructions, and we will agree to take all action that may be deemed necessary by the depositary in order to enable the depositary to do so. The depositary will not vote any shares of preferred stock except to the extent that it receives specific instructions from the holders of depositary shares representing that number of shares of preferred stock.

Charges of the Depositary

We will pay all transfer and other taxes and governmental charges arising solely from the existence of the depositary arrangements. We will pay charges of the depositary in connection with the initial deposit of the preferred stock and any redemption of the preferred stock. Holders of depositary receipts will pay transfer, income and other taxes and governmental charges and such other charges (including those in connection with the receipt and distribution of dividends, the sale or exercise of rights, the withdrawal of the preferred stock and the transferring, splitting or grouping of depositary receipts) as are expressly provided in the deposit agreement to be for their accounts. If these charges have not been paid by the holders of depositary receipts, the depositary may refuse to transfer depositary shares, withhold dividends and distributions and sell the depositary shares evidenced by the depositary receipt.

Amendment and Termination of the Deposit Agreement

The form of depositary receipt evidencing the depositary shares and any provision of the deposit agreement may be amended by agreement between us and the depositary. However, any amendment that materially and

adversely alters the rights of the holders of depositary shares, other than fee changes, will not be effective unless the amendment has been approved by the holders of a majority of the outstanding depositary shares. The deposit agreement may be terminated by the depositary or us only if:

- all outstanding depositary shares have been redeemed; or
- there has been a final distribution of the preferred stock in connection with our dissolution and such distribution has been made to all the holders of depositary shares.

Resignation and Removal of Depositary

The depositary may resign at any time by delivering to us notice of its election to do so, and we may remove the depositary at any time. Any resignation or removal of the depositary will take effect upon our appointment of a successor depositary and its acceptance of such appointment. The successor depositary must be appointed within 60 days after delivery of the notice of resignation or removal and must be a bank or trust company having its principal office in the United States and having the requisite combined capital and surplus as set forth in the applicable agreement.

Notices

The depositary will forward to holders of depositary receipts all notices, reports and other communications, including proxy solicitation materials received from us, that are delivered to the depositary and that we are required to furnish to the holders of the preferred stock. In addition, the depositary will make available for inspection by holders of depositary receipts at the principal office of the depositary, and at such other places as it may from time to time deem advisable, any reports and communications we deliver to the depositary as the holder of preferred stock.

Limitation of Liability

Neither we nor the depositary will be liable if either is prevented or delayed by law or any circumstance beyond its control in performing its obligations. Our obligations and those of the depositary will be limited to performance in good faith of our and its duties thereunder. We and the depositary will not be obligated to prosecute or defend any legal proceeding in respect of any depositary shares or preferred stock unless satisfactory indemnity is furnished. We and the depositary may rely upon written advice of counsel or accountants, on information provided by persons presenting preferred stock for deposit, holders of depositary receipts or other persons believed to be competent to give such information and on documents believed to be genuine and to have been signed or presented by the proper party or parties.

DESCRIPTION OF WARRANTS

We may issue warrants to purchase debt securities, preferred stock, depositary shares or common stock. We may offer warrants separately or together with one or more additional warrants, debt securities, preferred stock, depositary shares or common stock, or any combination of those securities in the form of units, as described in the applicable prospectus supplement. If we issue warrants as part of a unit, the applicable prospectus supplement will specify whether those warrants may be separated from the other securities in the unit prior to the expiration date of the warrants. The applicable prospectus supplement will describe the following terms of any warrants:

- the specific designation and aggregate number of, and the offering price at which we will issue, the warrants;
- the currency or currency units in which the offering price, if any, and the exercise price are payable;
- the date on which the right to exercise the warrants will begin and the date on which that right will expire or, if you may not continuously exercise the warrants throughout that period, the specific date or dates on which you may exercise the warrants;
- whether the warrants are to be sold separately or with other securities as parts of units;
- whether the warrants will be issued in definitive or global form or in any combination of these forms, although, in any case, the form of a warrant included in a unit will correspond to the form of the unit and of any security included in that unit;
- any applicable material U.S. federal income tax consequences;
- the identity of the warrant agent for the warrants and of any other depositaries, execution or paying agents, transfer agents, registrars or other agents;
- the proposed listing, if any, of the warrants or any securities purchasable upon exercise of the warrants on any securities exchange;
- the designation and terms of any equity securities purchasable upon exercise of the warrants;
- the designation, aggregate principal amount, currency and terms of any debt securities that may be purchased upon exercise of the warrants;
- if applicable, the designation and terms of the debt securities, preferred stock, depositary shares or common stock with which the warrants are issued and the number of warrants issued with each security;
- if applicable, the date from and after which any warrants issued as part of a unit and the related debt securities, preferred stock, depositary shares or common stock will be separately transferable;
- the number of shares of preferred stock, the number of depositary shares or the number of shares of common stock purchasable upon exercise of a warrant and the price at which those shares may be purchased;
- if applicable, the minimum or maximum amount of the warrants that may be exercised at any one time;
- information with respect to book-entry procedures, if any;
- the antidilution provisions, and other provisions for changes to or adjustment in the exercise price, of the warrants, if any;
- any redemption or call provisions; and
- any additional terms of the warrants, including terms, procedures and limitations relating to the exchange or exercise of the warrants.

DESCRIPTION OF SUBSCRIPTION RIGHTS

We may issue subscription rights to purchase our common stock, preferred stock, warrants or debt securities, or units consisting of some or all of these securities. These subscription rights may be offered independently or together with any other security offered hereby and may or may not be transferable by the stockholder receiving the subscription rights in such offering. In connection with any offering of subscription rights, we may enter into a standby arrangement with one or more underwriters or other purchasers pursuant to which the underwriters or other purchasers may be required to purchase any securities remaining unsubscribed for after such offering.

The prospectus supplement relating to any subscription rights we offer, if any, will, to the extent applicable, include specific terms relating to the offering, including some or all of the following:

- the price, if any, for the subscription rights;
- the exercise price payable for our common stock, preferred stock, warrants or debt securities, or units consisting of some or all of these securities, upon the exercise of the subscription rights;
- the number of subscription rights to be issued to each stockholder;
- the number and terms of our common stock, preferred stock, warrants or debt securities, or units consisting of some or all of these securities, which may be purchased per each subscription right;
- the extent to which the subscription rights are transferable;
- any other terms of the subscription rights, including the terms, procedures and limitations relating to the exchange and exercise of the subscription rights;
- the date on which the right to exercise the subscription rights shall commence, and the date on which the subscription rights shall expire;
- the extent to which the subscription rights may include an over-subscription privilege with respect to unsubscribed securities or an over-allotment privilege to the extent the securities are fully subscribed; and
- if applicable, the material terms of any standby underwriting or purchase arrangement which may be entered into by us in connection with the offering of subscription rights.

The descriptions of the subscription rights in this prospectus and in any prospectus supplement are summaries of the material provisions of the applicable subscription right agreements. These descriptions do not restate those subscription right agreements in their entirety and may not contain all the information that you may find useful. We urge you to read the applicable subscription right agreements because the agreements, and not the summaries, define your rights as holders of the subscription rights. For more information, please review the forms of the relevant subscription right agreements, which will be filed with the SEC promptly after the offering of subscription rights and will be available as described in the section of this prospectus captioned "*Where You Can Find More Information*."

DESCRIPTION OF PURCHASE CONTRACTS

The following description summarizes the general features of the purchase contracts that we may offer under this prospectus. Although the features we have summarized below will generally apply to any future purchase contracts we may offer under this prospectus, we will describe the particular terms of any purchase contracts that we may offer in more detail in the applicable prospectus supplement. The specific terms of any purchase contracts may differ from the description provided below as a result of negotiations with third parties in connection with the issuance of those purchase contracts, as well as for other reasons. Because the terms of any purchase contracts we offer under a prospectus supplement may differ from the terms we describe below, you should rely solely on information in the applicable prospectus supplement if that summary is different from the summary in this prospectus.

We will incorporate by reference into the registration statement, of which this prospectus is a part, the form of any purchase contract that we may offer under this prospectus before the sale of the related purchase contract. We urge you to read any applicable prospectus supplement related to specific purchase contracts being offered, as well as the complete instruments that contain the terms of the securities that are subject to those purchase contracts. Certain of those instruments, or forms of those instruments, have been filed as exhibits to the registration statement of which this prospectus is a part, and supplements to those instruments or forms may be incorporated by reference into the registration statement, of which this prospectus is a part, from reports we file with the SEC.

We may issue purchase contracts, including contracts obligating holders to purchase from us, and for us to sell to holders, a specific or variable number of our securities at a future date or dates. Alternatively, the purchase contracts may obligate us to purchase from holders, and obligate holders to sell to us, a specific or varying number of our securities.

If we offer any purchase contracts, certain terms of that series of purchase contracts will be described in the applicable prospectus supplement, including, without limitation, the following:

- the price of the securities or other property subject to the purchase contracts (which may be determined by reference to a specific formula described in the purchase contracts);
- whether the purchase contracts are issued separately, or as a part of units each consisting of a purchase contract and one or more of our other securities, securing the holder's obligations under the purchase contract;
- any requirement for us to make periodic payments to holders or vice versa, and whether the payments are unsecured or pre-funded;
- any provisions relating to any security provided for the purchase contracts;
- whether the purchase contracts obligate the holder or us to purchase or sell, or both purchase and sell, the securities subject to purchase under the purchase contract, and the nature and amount of each of those securities, or the method of determining those amounts;
- whether the purchase contracts are to be prepaid or not;
- whether the purchase contracts are to be settled by delivery, or by reference or linkage to the value, performance or level of the securities subject to purchase under the purchase contract;
- any acceleration, cancellation, termination or other provisions relating to the settlement of the purchase contracts;
- a discussion of certain U.S. federal income tax considerations applicable to the purchase contracts;
- whether the purchase contracts will be issued in fully registered or global form; and
- any other terms of the purchase contracts and any securities subject to such purchase contracts.

DESCRIPTION OF UNITS

We may issue units comprised of one or more of the other securities that may be offered under this prospectus, in any combination. The following, together with the additional information we may include in any applicable prospectus supplement, summarizes the material terms and provisions of the units that we may offer under this prospectus. While the terms summarized below will apply generally to any units we may offer, we will describe the particular terms of any series of units in more detail in the applicable prospectus supplement. If we indicate in the prospectus supplement, the terms of any units offered under that prospectus supplement may differ from the terms described below. Specific unit agreements will contain additional important terms and provisions and will be incorporated by reference as an exhibit to the registration statement that includes this prospectus.

Each unit will be issued so that the holder of the unit is also the holder of each security included in the unit. Thus, the holder of a unit will have the rights and obligations of a holder of each included security. The unit agreement under which a unit is issued may provide that the securities included in the unit may not be held or transferred separately at any time, or at any time before a specified date.

We will describe in the applicable prospectus supplement the terms of the series of units being offered, including:

- the material terms of the units and of the securities comprising the units, including whether and under what circumstances those securities may be held or transferred separately;
- any material provisions relating to the issuance, payment, settlement, transfer or exchange of the units or of the securities comprising the units; and
- any material provisions of the governing unit agreement that differ from those described above.

We may issue units in such amounts and in such numbers of distinct series as we determine.

The provisions described in this section, as well as those described under "*Description of Debt Securities*," "*Description of Capital Stock*" and "*Description of Warrants*" will apply to each unit, as applicable, and to any debt securities, common stock, preferred stock or warrant included in each unit, as applicable.

Unit Agent

The name and address of the unit agent for any units we offer will be set forth in the applicable prospectus supplement.

Enforceability of Rights by Holders of Units

Each unit agent will act solely as our agent under the applicable unit agreement and will not assume any obligation or relationship of agency or trust with any holder of any unit. A single bank or trust company may act as unit agent for more than one series of units. A unit agent will have no duty or responsibility in case of any default by us under the applicable unit agreement or unit, including any duty or responsibility to initiate any proceedings at law or otherwise, or to make any demand upon us. Any holder of a unit may, without the consent of the related unit agent or the holder of any other unit, enforce by appropriate legal action its rights as holder under any security included in the unit.

DIVIDEND POLICY

The payment of dividends on our common stock will be at the discretion of our board of directors and will depend on our results of operations, capital requirements, financial condition, prospects, contractual arrangements, any limitations on payment of dividends present in our future debt agreements, and other factors that our board of directors may deem relevant.

PLAN OF DISTRIBUTION

We may sell the securities in one or more of the following ways (or in any combination) from time to time:

- pursuant to underwritten public offerings;
- in negotiated transactions;
- in block trades;
- in "at the market" offerings, within the meaning of Rule 415(a)(4) of the Securities Act, to or through a market maker or into an existing trading market on an exchange or otherwise;
- subscription rights offerings,
- through underwriters or dealers;
- directly to purchasers;
- through agents; or
- through a combination of any of these methods of sale.

In addition, we may issue the securities as a dividend or distribution or in a subscription rights offering to our existing securityholders. This prospectus may be used in connection with any offering of our securities through any of these methods or other methods described in the applicable prospectus supplement.

We may directly solicit offers to purchase securities, or agents may be designated to solicit such offers. We will, in the prospectus supplement relating to such offering, name any agent that could be viewed as an underwriter under the Securities Act, and describe any commissions that we must pay. Any such agent will be acting on a best efforts basis for the period of its appointment or, if indicated in the applicable prospectus supplement, on a firm commitment basis.

The distribution of the securities may be effected from time to time in one or more transactions:

- at a fixed price, or prices, which may be changed from time to time;
- at market prices prevailing at the time of sale;
- at prices related to such prevailing market prices; or
- at negotiated prices.

If we use underwriters in the sale, the securities will be acquired by the underwriters for their own account and may be resold from time to time in one or more transactions, including:

- negotiated transactions;
- at a fixed public offering price or prices, which may be changed;
- at market prices prevailing at the time of sale;
- at prices related to prevailing market prices; or
- at negotiated prices.

Each prospectus supplement will describe the method of distribution of the securities and any applicable restrictions.

The prospectus supplement with respect to the securities of a particular series will describe the terms of the offering of the securities, including the following:

- the name of the agent or any underwriters;
- the public offering or purchase price and the proceeds we will receive from the sale of the securities;

- any discounts and commissions to be allowed or re-allowed or paid to the agent or underwriters;
- all other items constituting underwriting compensation;
- any discounts and commissions to be allowed or re-allowed or paid to dealers; and
- any exchanges on which the securities will be listed.

We may sell the securities through agents from time to time.

We may sell the securities to other stockholders of the Company through a rights offering. This prospectus may be used in connection with any offering of our securities through any of these methods or other methods described in the applicable prospectus supplement.

If any underwriters or agents are utilized in the sale of the securities in respect of which this prospectus is delivered, we will enter into an underwriting agreement or other agreement with them at the time of sale to them, and we will set forth in the prospectus supplement relating to such offering the names of the underwriters or agents and the terms of the related agreement with them.

If a dealer is utilized in the sale of the securities in respect of which this prospectus is delivered, we will sell such securities to the dealer, as principal. The dealer may then resell such securities to the public at varying prices to be determined by such dealer at the time of resale.

If we offer securities in a subscription rights offering to our existing securityholders, we may enter into a standby underwriting agreement with dealers, acting as standby underwriters. We may pay the standby underwriters a commitment fee for the securities they commit to purchase on a standby basis. If we do not enter into a standby underwriting arrangement, we may retain a dealer-manager to manage a subscription rights offering for us.

Remarketing firms, agents, underwriters, dealers and other persons may be entitled under agreements which they may enter into with us to indemnification by us against certain civil liabilities, including liabilities under the Securities Act, and may be customers of, engage in transactions with or perform services for us in the ordinary course of business.

If so indicated in the applicable prospectus supplement, we will authorize underwriters or other persons acting as our agents to solicit offers by certain institutions to purchase securities from us pursuant to delayed delivery contracts providing for payment and delivery on the date stated in the prospectus supplement. Each contract will be for an amount not less than, and the aggregate amount of securities sold pursuant to such contracts shall not be less nor more than, the respective amounts stated in the prospectus supplement. Institutions with whom the contracts, when authorized, may be made include commercial and savings banks, insurance companies, pension funds, investment companies, educational and charitable institutions and other institutions, but shall in all cases be subject to our approval. Delayed delivery contracts will not be subject to any conditions except that:

- the purchase by an institution of the securities covered under that contract shall not at the time of delivery be prohibited under the laws of the jurisdiction to which that institution is subject; and
- if the securities are also being sold to underwriters acting as principals for their own account, the underwriters shall have purchased such securities not sold for delayed delivery. The underwriters and other persons acting as our agents will not have any responsibility in respect of the validity or performance of delayed delivery contracts.

Certain agents, underwriters and dealers, and their associates and affiliates may be customers of, have borrowing relationships with, engage in other transactions with, and/or perform services, including investment banking services, for us or one or more of our respective affiliates in the ordinary course of business.

In order to facilitate the offering of the securities, any underwriters may engage in transactions that stabilize, maintain or otherwise affect the price of the securities or any other securities the prices of which may be used to determine payments on such securities. Specifically, any underwriters may overallot in connection with the offering, creating a short position for their own accounts. In addition, to cover overallotments or to stabilize the price of the securities or of any such other securities, the underwriters may bid for, and purchase, the securities or any such other securities in the open market. Finally, in any offering of the securities through a syndicate of underwriters, the underwriting syndicate may reclaim selling concessions allowed to an underwriter or a dealer for distributing the securities in the offering if the syndicate repurchases previously distributed securities in transactions to cover syndicate short positions, in stabilization transactions or otherwise. Any of these activities may stabilize or maintain the market price of the securities above independent market levels. Any such underwriters are not required to engage in these activities and may end any of these activities at any time.

Under Rule 15c6-1 of the Exchange Act, trades in the secondary market generally are required to settle in two business days, unless the parties to any such trade expressly agree otherwise or the securities are sold by us to an underwriter in a firm commitment underwritten offering. The applicable prospectus supplement may provide that the original issue date for your securities may be more than two scheduled business days after the trade date for your securities. Accordingly, in such a case, if you wish to trade securities on any date prior to the second business day before the original issue date for your securities, you will be required, by virtue of the fact that your securities initially are expected to settle in more than two scheduled business days after the trade date for your securities, to make alternative settlement arrangements to prevent a failed settlement.

The securities may be new issues of securities and may have no established trading market. The securities may or may not be listed on a national securities exchange. We can make no assurance as to the liquidity of or the existence of trading markets for any of the securities.

In compliance with the guidelines of the Financial Industry Regulatory Authority, or FINRA, the aggregate maximum discount, commission or agency fees or other items constituting underwriting compensation to be received by any FINRA member or independent broker-dealer will not exceed 8% of the proceeds from any offering pursuant to this prospectus and any applicable prospectus supplement.

LEGAL MATTERS

Unless the applicable prospectus supplement indicates otherwise, the validity of the securities being offered by this prospectus will be passed upon by Baker & Hostetler, LLP. Additional legal matters may be passed upon for us or any underwriters, dealers or agents by counsel that we will name in the applicable prospectus supplement.

EXPERTS

The consolidated financial statements of Pulse Biosciences, Inc. as of December 31, 2023 and 2022, and for each of the two years in the period ended December 31, 2023, incorporated by reference in this Prospectus by reference to Pulse Biosciences Inc.'s annual report on Form 10-K for the year ended December 31, 2023, have been audited by Deloitte & Touche LLP, an independent registered public accounting firm, as stated in their report. Such consolidated financial statements are incorporated by reference in reliance upon the report of such firm given their authority as experts in accounting and auditing.

INCORPORATION OF CERTAIN INFORMATION BY REFERENCE

The SEC allows us to "incorporate by reference" information into this prospectus. This means that we can disclose important information about us and our financial condition to you by referring you to other documents filed separately with the SEC. The information incorporated by reference is considered to be a part of this prospectus, except any information that is superseded by information that is included in a document subsequently filed with the SEC.

This prospectus incorporates by reference the documents listed below that we have previously filed with the SEC and any future filings we make with the SEC under Sections 13(a), 13(c), 14 or 15(d) of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), from the date of this prospectus until the termination of an offering of securities, except that we are not incorporating by reference any information furnished (and not filed) with the SEC, including any information furnished pursuant to Items 2.02 or 7.01 of Form 8-K or related exhibits furnished pursuant to Item 9.01 of Form 8-K:

- Our Annual Report on Form 10-K for the fiscal year ended December 31, 2023, as filed on March 28, 2024;
- Our Current Reports on Form 8-K filed on January 2, 2024, February 14, 2024 and March 11, 2024;
- The description of our common stock contained in the Registration Statement on Form 8-A relating thereto, filed on April 15, 2016, including any amendment or report filed for the purpose of updating such description.

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

A copy of any document incorporated by reference in this prospectus may be obtained at no cost by writing or telephoning us at the following address and telephone number:

Pulse Biosciences, Inc.
3957 Point Eden Way
Hayward, CA 94545
Attn: Investor Relations
510-906-4600

We maintain a website at www.pulsebiosciences.com. Information about us, including our reports filed with the SEC, is available through that site. Such reports are accessible at no charge through our website and are made available as soon as reasonably practicable after such material is filed with or furnished to the SEC. Our website and the information contained on that website, or connected to that website, are not incorporated by reference in this prospectus.

You may read and copy any materials we file with the SEC at the SEC's website mentioned under the heading "*Where You Can Find More Information*." The information on the SEC's website is not incorporated by reference in this prospectus.

WHERE YOU CAN FIND MORE INFORMATION

We file annual, quarterly and current reports, proxy statements and other information with the SEC. Our SEC filings are available to the public over the Internet at the SEC's website at www.sec.gov. Copies of certain information filed by us with the SEC are also available on our website at www.pulsebiosciences.com. The information contained in, or accessible through, our website, however, should not be considered a part of this prospectus.

This prospectus is part of a registration statement we filed with the SEC. This prospectus does not contain all of the information included in the registration statement and the amendments, exhibits and schedules thereto, in accordance with SEC rules and regulations. You should review the information and exhibits in the registration statement for further information on us and our consolidated subsidiaries and the securities we are offering. Statements in this prospectus concerning any document we filed as an exhibit to the registration statement or that we otherwise filed with the SEC are not intended to be comprehensive and are qualified by reference to these filings. You should review the complete document to evaluate these statements. You can obtain a copy of the registration statement from the SEC at the address listed above or from the SEC's website.

Up to $60,000,000

Pulse Biosciences, Inc.

Common Stock

PROSPECTUS SUPPLEMENT

July 15, 2024

Canaccord Genuity **Needham & Company**