INVIVO THERAPEUTICS HOLDINGS CORP.
Form 424B5
March 14, 2016

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Registration No. 333-188573

The information in this preliminary prospectus supplement is not complete and may be changed. A registration statement relating to these securities has been declared effective by the Securities and Exchange Commission. This preliminary prospectus supplement and the accompanying prospectus are not an offer to sell these securities, and we are not soliciting offers to buy these securities in any jurisdiction where the offer or sale is not permitted.

SUBJECT TO COMPLETION, DATED MARCH 14, 2016

Prospectus Supplement
(To Prospectus dated May 22, 2013)

Shares of Common Stock

Warrants to Purchase Shares of Common Stock

We are offering shares of our common stock and warrants to purchase up to shares of our common stock at an exercise price of $ per whole share of common stock pursuant to this prospectus supplement and the accompanying prospectus. The shares of common stock and warrants will be sold in units, with each unit consisting of one share of common stock and of a warrant to purchase one share of common stock. Each unit will be sold at a price of $ per unit. The shares of common stock and warrants will be mandatorily separable immediately upon issuance.

Our common stock is traded on The NASDAQ Global Market under the symbol "NVIV." The last reported sale price of our common stock on March 11, 2016 was $9.08 per share.

The warrants are not and will not be listed for trading on The NASDAQ Global Market, or any other securities exchange or nationally recognized trading system. There is no market through which the warrants may be sold, and purchasers may not be able to resell the warrants purchased under this prospectus supplement. This may affect the pricing of the warrants in the secondary market, the transparency and availability of trading prices, and the liquidity of the warrants.

Our business and an investment in our common stock include significant risks. See "Risk Factors" on page S-7 of this prospectus supplement and on page 2 of the accompanying prospectus, as well as in our periodic reports filed with the Securities and Exchange Commission and incorporated by reference in this prospectus supplement and the accompanying prospectus.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or determined if this prospectus supplement and the accompanying prospectus are truthful or complete. Any representation

to the contrary is a criminal offense.

	Per Unit	Total
Public offering price	$	$
Underwriting discount and commissions (1)	$	$
Proceeds, before expenses, to us	$	$

(1) For additional information about the expenses for which we have agreed to reimburse the underwriters in connection with this offering, see "Underwriting" beginning on page S-19 of this prospectus supplement.

We have granted the underwriters an option for a period of 30 days from the date of this prospectus supplement to purchase up to an additional shares of common stock and/or additional warrants to purchase up to shares of common stock at a price of $ per warrant to cover overallotments at the public offering price, less underwriting discounts and commissions.

The underwriters expect to deliver the shares against payment on or about March , 2016.

RAYMOND JAMES

The date of this prospectus supplement is March , 2016.

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About This Prospectus Supplement

This document is in two parts. The first part is this prospectus supplement, which describes the terms of this offering of securities and also adds to and updates information contained in the accompanying prospectus and the documents incorporated by reference into this prospectus supplement and the accompanying prospectus. The second part, the accompanying prospectus dated May 22, 2013, including the documents incorporated by reference therein, provides more general information. Generally, when we refer to this prospectus, we are referring to both parts of this document combined. To the extent there is a conflict between the information contained in this prospectus supplement, on the one hand, and the information contained in the accompanying prospectus or in any document incorporated by reference that was filed with the Securities and Exchange Commission, or SEC, before the date of this prospectus supplement, on the other hand, 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 the accompanying prospectus the statement in the document having the later date modifies or supersedes the earlier statement.

You should rely only on the information contained in or incorporated by reference in this prospectus supplement and the accompanying prospectus. We have not, and the underwriters have not, authorized anyone to provide you with different information. If anyone provides you with different or inconsistent information, you should not rely on it. We are not, and the underwriters are not, making 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, the accompanying prospectus, and the documents incorporated by reference in this prospectus supplement and the accompanying prospectus, is accurate only as of the date of those respective documents. Our business, financial condition, results of operations and prospects may have changed since those dates. You should read this prospectus supplement, the accompanying prospectus, and the documents incorporated by reference in this prospectus supplement and the accompanying prospectus, in their entirety before making an investment decision. You should also read and consider the information in the documents to which we have referred you in the sections of this prospectus supplement entitled "Where You Can Find More Information" and "Incorporation of Certain Documents by Reference."

Unless otherwise mentioned or unless the context requires otherwise, all references in this prospectus supplement to "InVivo Therapeutics," "InVivo," "the Company," "our company," "we," "us," "our" or similar references mean collectively InVivo Therapeutics Holdings Corp. and its subsidiaries.

This prospectus supplement, the accompanying prospectus and the information incorporated herein and therein by reference include trademarks, service marks and trade names owned by us or other companies. All trademarks, service marks and trade names included or incorporated by reference into this prospectus supplement or the accompanying prospectus are the property of their respective owners.

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Prospectus Supplement Summary

This summary highlights certain information about us, this offering and selected information contained elsewhere in or incorporated by reference into this prospectus supplement or the accompanying prospectus. This summary is not complete and does not contain all of the information that you should consider before deciding whether to invest in our securities. For a more complete understanding of our company and this offering, we encourage you to read and consider carefully the more detailed information in this prospectus supplement and the accompanying prospectus, including the information under the heading "Risk Factors" in this prospectus supplement on page S-7 and in the accompanying prospectus on page 2, and the information incorporated by reference in this prospectus supplement and the accompanying prospectus.

InVivo Therapeutics Holdings Corp.

Business Overview

We are a research and clinical-stage biomaterials and biotechnology company with a focus on treatment of spinal cord injuries (SCI). Our mission is to redefine the life of the SCI patient, and we are developing treatment options intended to provide meaningful improvement in patient outcomes following SCI. Our approach to treating acute SCIs is based on our investigational *Neuro-Spinal Scaffold* implant, an investigational bioresorbable polymer scaffold that is designed for implantation at the site of injury within a spinal cord contusion and is intended to treat acute spinal cord injury. We believe the *Neuro-Spinal Scaffold* implant is the only SCI therapy in development focused solely on treating acute SCI directly at the epicenter of the injury. The *Neuro-Spinal Scaffold* implant incorporates intellectual property licensed under an exclusive, world-wide license from Boston Children's Hospital ("BCH") and the Massachusetts Institute of Technology ("MIT"). We are continually evaluating other technologies and therapeutics that may be complementary to our development of the *Neuro-Spinal Scaffold* implant or offer the potential to bring us closer to our goal of redefining the life of the SCI patient.

Our Clinical and Pre-Clinical Programs

We currently have a clinical development program for acute SCI and a pre-clinical development program for chronic SCI.

Neuro-Spinal Scaffold implant for acute SCI

Our leading product under development is our *Neuro-Spinal Scaffold* implant, an investigational bioresorbable polymer scaffold that is designed for implantation at the site of injury within a spinal cord contusion. The *Neuro-Spinal Scaffold* implant is intended to provide support to the surrounding tissue after injury, minimizing expansion areas of necrosis, and supporting endogenous healing/repair processes following injury. This form of appositional healing harbors the promise of sparing white matter, increasing neural sprouting, and diminishing post-traumatic cyst formation.

The *Neuro-Spinal Scaffold* implant is composed of two biocompatible and bioresorbable polymers that are cast to form a highly porous investigational product:

- Poly lactic-co-glycolic acid (PLGA), a polymer that is widely used in resorbable sutures and provides the biocompatible support for *Neuro-Spinal Scaffold* implant; and

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Poly-L-Lysine (PLL), a positively charged polymer commonly used to coat surfaces in order to promote cellular attachment.

Because of the complexity of spinal cord injuries, it is likely that multi- modal therapies will be required in order to maximize positive outcomes in SCI patients. In the future, we may attempt to further enhance the performance of our *Neuro-Spinal Scaffold* by multiple combination strategies involving electrostimulation devices, additional biomaterials, drugs approved by the U.S. Food & Drug Administration ("FDA"), or growth factors. We expect the *Neuro-Spinal Scaffold* will be regulated by the FDA as a Class III medical device.

Bioengineered Neural Trails injection program for chronic SCI

In December 2015, we announced our preclinical Bioengineered Neural Trails injection program for the treatment of chronic spinal cord injury. Bioengineered Neural Trails are injectable combinations of biomaterials and neural stem cells (NSCs) delivered using minimally-invasive surgical instrumentation and techniques to create trails across the chronic injury site. To support this program, we recently entered into an exclusive license agreement with the University of California, San Diego and an assignment agreement with James Guest, M.D., Ph.D., for issued patents covering technology related to the Bioengineered Neural Trails program, and we also have filed a provisional application in support of the Bioengineered Neural Trails injection program. We expect that our Bioengineered Neural Trails injection investigational product will be regulated by the FDA as a combination product, and we are targeting a pre-Investigational New Drug meeting with the FDA by the end of 2016.

Management

Members of our current senior management team bring significant experience to our company and are well-suited to realize our company's potential.

Mark D. Perrin: Mr. Perrin, our Chief Executive Officer, joined our company in January 2014, and has previously served as President and Chief Executive Officer of ConjuChem Biotechnologies and Executive Vice President and Chief Commercial Officer for Orphan Medical, until it was acquired by Jazz Pharmaceutical.

Dr. Thomas Ulich: Dr. Ulich, our Chief Scientific Officer, joined our company in February 2014, and previously headed preclinical research at Amgen Corporation and research and development at Alnylam Pharmaceuticals.

Dr. Lorianne Masuoka: Dr. Masuoka, our Chief Medical Officer, joined our company in March 2015, and previously managed clinical research, drug safety, biostatistics and data management, and clinical operations at Cubist Pharmaceuticals, Inc. and served as Senior Vice President and Chief Medical Officer at Nektar Therapeutics.

Tamara Joseph, JD: Ms. Joseph was named our Senior Vice President, General Counsel and Chief Compliance Officer in March 2014. She previously served as General Counsel of Cubist Pharmaceuticals Inc. and Transkaryotic Therapies, Inc.

Steven McAllister joined our company as interim Chief Financial Officer in December 2013, and was named our permanent Chief Financial Officer in June 2014, and has previously served as Vice President of Finance and Administration for the Spine and Bone Healing Technologies division of Biomet, Inc.

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Christopher McNulty, our Senior Vice President, Business Development and Investor Relations, joined our company in November 2013, and previously served as Senior Director of Business at Repligen Corporation and Associate Director of Business Development and Alliance Management at Genzyme Corporation.

Recent Developments

The INSPIRE Study

In late 2015, we completed our early feasibility pilot study of our *Neuro-Spinal Scaffold* under our approved Investigational Device Exemption application (IDE) for the treatment of complete, traumatic acute spinal cord injury. The study was intended to capture the safety and feasibility of the *Neuro-Spinal Scaffold* for the treatment of complete functional spinal cord injury, as well as to gather preliminary evidence of the clinical effectiveness of the *Neuro-Spinal Scaffold*.

In January 2016, the FDA approved converting the pilot study into a pivotal probable benefit study formally known as The INSPIRE Study: InVivo Study of Probable Benefit of the *Neuro-Spinal Scaffold* for Safety and Neurologic Recovery in Subjects with Complete Thoracic AIS A Spinal Cord Injury. The purpose of the study is to evaluate whether the *Neuro-Spinal Scaffold* implant is safe and demonstrates probable benefit for the treatment of complete T2-T12/L1 spinal cord injury. The primary endpoint of The INSPIRE Study is defined as the proportion of patients achieving an improvement of at least one ASIA Impairment Scale (AIS) grade by 6 months. Additional endpoints of The INSPIRE Study include a reduction in pain and improvements in sensory and motor scores, bladder and bowel function, Spinal Cord Independence Measure and quality of life. We intend to submit the data from The INSPIRE Study for marketing approval using the Humanitarian Device Exemption, or HDE, regulatory pathway, which requires us to show the device does not pose an unreasonable or significant risk of illness or injury, and that the probable benefit of health outweighs the risk of injury or illness from its use.

The INSPIRE Study is currently approved to enroll up to 12 patients, but we expect that the FDA will approve 20 patients, inclusive of the five pilot patients, following the review of the complete 6-month data package for the first five patients. On February 23, 2016, we enrolled a sixth patient into The INSPIRE Study. There are currently 18 clinical sites participating in The INSPIRE Study, inclusive of an additional site announced in March 2016 at Thomas Jefferson University Hospital.

On February 29, 2016, we announced the Objective Performance Criterion, or the OPC, for the The INSPIRE Study. An OPC is a measure of study success that is used in clinical studies designed to demonstrate probable benefit in support of an HDE approval. We announced an OPC for The INSPIRE Study as 25% or more of the patients in the study demonstrating an improvement of at least one ASIA Impairment Scale (AIS) grade at six months post-implantation. Although our OPC is the fundamental component to demonstrate probable benefit, it is important to note that the OPC is not the only variable that the FDA evaluates when reviewing an HDE application. Approval is not guaranteed if the OPC is met, and even if the OPC is not met, the FDA may approve a therapy if probable benefit is supported by a comprehensive review of all clinical endpoints and preclinical results, as demonstrated by the sponsor's body of evidence.

In late February 2016, the FDA accepted our proposed HDE modular shell submission and review process for the *Neuro-Spinal Scaffold*. Our HDE modular shell is comprised of three

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modules, a preclinical studies module, a manufacturing module, and a clinical data module. As part of its review process, the FDA reviews modules, which are individual sections of the HDE submission, on a rolling basis. Following the submission of each module, the FDA reviews and provides feedback, typically within 90 days, allowing the applicant to receive feedback and potentially resolve any deficiencies during the review process. Upon receipt of the final module, which constitutes the complete HDE submission, the FDA will make a filing decision which may trigger the review clock for an approval decision.

In March 2016, we announced that the fifth patient in The INSPIRE Study had improved from a complete AIS A spinal cord injury to an incomplete AIS B spinal cord injury between the three-month and the six-month post-injury assessment. As a result, three of the first five patients from The INSPIRE Study have experienced various degrees of neurological recovery by the six-month point.

Equity

To date, we have raised approximately $3.4 million through our previously announced "at the market" common equity program (our "ATM Program"), pursuant to which we were authorized to issue shares of common stock with an aggregate sale price of up to $50 million under a Sales Agreement entered into with Cowen and Company, LLC ("Cowen") acting as sales agent. In March 2016, we entered into a termination agreement with Cowen, pursuant to which our ATM Program was terminated.

Corporate Information

We were incorporated on April 2, 2003, under the name of Design Source, Inc. On October 26, 2010, we acquired the business of InVivo Therapeutics Corporation, which was founded in 2005, and are continuing the existing business operations of InVivo Therapeutics Corporation as our wholly-owned subsidiary.

Our principal executive offices are located in leased premises at One Kendall Square, Building 1400 East, 4th Floor, Cambridge, Massachusetts 02139. Our telephone number is (617) 863-5500. We maintain a website at www.invivotherapeutics.com. Information contained on, or accessible through, our website is not a part of, and is not incorporated by reference into, this prospectus supplement or the accompanying prospectus.

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The Offering

Common stock offered by us	shares (excluding shares of common stock issuable upon exercise of the warrants being offered in this offering). This prospectus supplement also relates to the offer and sale of the shares of common stock underlying the warrants being offered by us.
Warrants offered by us	Warrants to purchase up to shares of our common stock at an exercise price of $ per whole share. The warrants will be exercisable upon issuance and will expire on the five-year anniversary of issuance. See "Description of our Securities Warrants."
Offering price	$
Common stock outstanding immediately after this offering	shares or shares of our common stock assuming the warrants offered in this offering were to be immediately issued and exercised in full.
Over-allotment option	The underwriters have an option to purchase up to an additional shares of our common stock and/or additional warrants to purchase up to shares of common stock from us to cover over-allotments at the public offering price, less underwriting discounts and commissions. The underwriters can exercise their option at any time within 30 days from the date of this prospectus supplement.
Use of proceeds	We intend to use the net proceeds from the common stock offered hereby to fund ongoing clinical trials and for general corporate purposes. See "Use of Proceeds."
Risk factors	Investing in our common stock involves significant risks. See "Risk Factors" on page S-7 of this prospectus supplement and on page 2 of the accompanying prospectus.
Listing of Common Stock	Our common stock trades on The NASDAQ Global Market under the symbol "NVIV," and the shares to be issued in connection with this offering will also be listed on The NASDAQ Global Market under the same symbol. The warrants are not and will not be listed on The NASDAQ Global Market or other securities exchange or nationally recognized trading system.

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The number of shares of our common stock to be outstanding immediately after this offering as shown above is based on 27,555,948 shares outstanding as of December 31, 2015, and excludes as of that date:

- 1,156,779 shares of our common stock issuable upon exercise of warrants, having a weighted average exercise price of $5.71 per share;
- 3,253,310 shares of our common stock issuable upon exercise of outstanding stock options, having a weighted average exercise price of $7.47 per share;
- 3,524,946 shares of our common stock reserved for future issuances under our incentive compensation plans and 401(k) plan;
- 180,552 shares of common stock reserved for future sale under our employee stock purchase plan; and
- shares of common stock issuable upon exercise of warrants to be issued in this offering.

Except as otherwise indicated, all information in the prospectus supplement assumes no exercise by the underwriters of their overallotment option.

The shares of common stock issuable upon the exercise of our outstanding warrants and the exercise price of the warrants are subject to anti-dilution adjustments in certain circumstances. See "Dilution" on page S-13 of this prospectus supplement for more information about these possible anti-dilution adjustments.

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Risk Factors

An investment in our common stock involves a high degree of risk. Before deciding whether to invest in our common stock, you should consider carefully the risks described below and those described in our Annual Report on Form 10-K for the year ended December 31, 2015 and the other documents incorporated herein by reference before deciding to invest in our securities. You should carefully consider the risks described in therein and the other information in this prospectus supplement and accompanying prospectus before you decide to invest in our common stock. Such risks and uncertainties are not the only ones we face. Additional risks and uncertainties not presently known to us or that we currently deem immaterial may also affect us. If any of those risks were to occur, our financial condition, operating results and prospects, and the market price of our common stock would likely decline and you could lose all or part of your investment.

Risks Related to Investment in Our Securities and this Offering

The price of our common stock may become volatile, which could lead to losses by investors and costly securities litigation.

The trading price of our common stock is likely to be highly volatile and could fluctuate in response to factors such as:

- the status, completion and/or results of our clinical trials;
- actual or anticipated variations in our operating results;
- announcements of developments by us or our competitors;
- regulatory actions regarding our products;
- announcements by us or our competitors of significant acquisitions, strategic partnerships, joint ventures or capital commitments;
- adoption of new accounting standards affecting our industry;
- additions or departures of key personnel;
- sales of our common stock or other securities in the open market; and
- other events or factors, many of which are beyond our control.

The stock market is subject to significant price and volume fluctuations. In the past, following periods of volatility in the market price of a company's securities, securities class action litigation has often been initiated against such company. Litigation initiated against us, whether or not successful, could result in substantial costs and diversion of our management's attention and resources, which could harm our business and financial condition.

Investors may experience dilution of their ownership interests because of the future issuance of additional shares of our common stock.

As of December 31, 2015, there were outstanding warrants to purchase 1,156,779 shares of our common stock, and outstanding options to purchase 3,253,310 shares of our common stock.

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We expect to issue additional equity awards to compensate employees, consultants and directors, and may issue additional shares to raise capital, to acquire other companies or technologies, to pay for services, or for other corporate purposes. Any such issuances will have the effect of diluting the interest of current stockholders. The future issuance of any such additional shares of common stock may create downward pressure on the trading price of the common stock. There can be no assurance that we will not be required to issue additional shares, warrants or other convertible securities in the future in conjunction with any capital raising efforts, including at a price (or at exercise prices) below the price at which shares of our common stock are currently trading on The NASDAQ Global Market.

We have never declared any cash dividends and do not expect to declare any in the near future.

We have never paid cash dividends on our common stock. It is currently anticipated that we will retain earnings, if any, for use in the development of our business and we do not anticipate paying any cash dividends in the foreseeable future.

Our management will have broad discretion as to the use of the net proceeds from this offering, and may not use the proceeds effectively.

Our management will have broad discretion in the application of the net proceeds from this offering and could spend the proceeds in ways that you do not agree with or that do not improve our results of operations or enhance the value of our common stock, see "Use of Proceeds" below. Our failure to apply these funds effectively could have a material adverse effect on our business and cause the price of our common stock to decline.

You will experience immediate dilution in the book value per share of the common stock you purchase.

Because the price per share of our common stock being offered is substantially higher than the net tangible book value per share of our common stock, you will suffer substantial dilution in the net tangible book value of the common stock you purchase in this offering. If you purchase shares of common stock in this offering, you will suffer immediate and substantial dilution of $ per share in the net tangible book value of the common stock. See "Dilution" in this prospectus supplement for a more detailed discussion of the dilution which you will incur if you purchase common stock in this offering.

You may not be able to resell your warrants.

There is no established trading market for the warrants being offered in this offering, and we do not expect such a market to develop. In addition, we do not intend to apply for listing of the warrants on any securities exchange or other nationally recognized trading system, and you may not be able to resell your warrants. If your warrants cannot be resold, you will have to depend upon any appreciation in the value of our common stock over the exercise price of the warrants in order to realize a return on your investment in the warrants.

Investors will have no rights as a common stockholder with respect to their warrants until they exercise their warrants and acquire our common stock.

Until you acquire shares of our common stock upon exercise of your warrants, you will have no rights with respect to the shares of our common stock underlying such warrants. Upon

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exercise of your warrants, you will be entitled to exercise the rights of a common stockholder only as to matters for which the record date occurs after the exercise date.

Certain of our outstanding warrants may adjust as a result of this offering, which would result in dilution to our stockholders.

Our outstanding warrants issued on or about May 9, 2014 (the "2014 Warrants") to purchase a total of 395,716 shares of common stock as of December 31, 2015 at a current exercise price of $5.75 per share contain so-called full-ratchet anti-dilution provisions. These anti-dilution provisions may be triggered by the issuance of the securities being offered hereby or upon any future issuance by us of shares of our common stock or common stock equivalents at a price per share below the then-exercise price of the warrants, subject to some exceptions. The determination of whether common stock was sold at a price below the exercise price of the 2014 Warrants is made pursuant to a formula set forth in the 2014 Warrants which, among other things, assigns value to warrants issued in a unit transaction. As a result of this offering, the exercise price of the 2014 Warrants will be adjusted downwards from $5.75 to approximately $ per share and the 2014 Warrants will be exercisable for approximately shares of common stock, which will result in further dilution to our stockholders.

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Special Note Regarding Forward-Looking Information

This prospectus supplement, the accompanying prospectus and the documents we have filed with the SEC that are incorporated by reference into this prospectus supplement and the accompanying prospectus contain "forward-looking statements" within the meaning of Section 27A of the Securities Act of 1933, as amended, or the Securities Act, and Section 21E of the Securities Exchange Act of 1934, as amended, or the Exchange Act. These statements relate to future events or to our future operating or financial performance and involve known and unknown risks, uncertainties and other factors which may cause our actual results, performance or achievements to be materially different from any future results, performances or achievements expressed or implied by the forward-looking statements. Forward-looking statements may include, but are not limited to, statements about:

our limited operating history and history of net losses;

our ability to raise substantial additional capital to finance our planned operations and to continue as a going concern;

our ability to successfully commercialize our current and future product candidates, including our *Neuro-Spinal Scaffold*;

our ability to successfully complete clinical trials and obtain and maintain regulatory approval of our product candidates;

our ability to protect and maintain our intellectual property and licensing arrangements;

market acceptance of our technology and products;

our ability to promote, manufacture and sell our products, either directly or through collaborative and other arrangements with third parties;

our ability to attract and retain key personnel; and

our use of proceeds from this offering.

In some cases, you can identify forward-looking statements by terms such as "may," "might," "will," "should," "intends," "expects," "plans," "goals," "projects," "anticipates," "believes," "estimates," "predicts," "potential" or "continue" and similar expressions intended to identify forward-looking statements. These statements reflect our current views with respect to future events and are based on assumptions and subject to risks and uncertainties. Given these uncertainties, you should not place undue reliance on these forward-looking statements. We discuss many of these risks in greater detail under the heading "Risk Factors" on page S-7 of this prospectus supplement and on page 2 of the accompanying prospectus and in our SEC filings. Also, these forward-looking statements represent our estimates and assumptions only as of the date of the document containing the applicable statement.

You should read this prospectus supplement, the accompanying prospectus and the documents we have filed with the SEC that are incorporated by reference into this prospectus supplement and the accompanying prospectus completely and with the understanding that our actual future results may be materially different from what we expect. We qualify all of the forward-looking statements in the foregoing documents by these cautionary statements.

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You should rely only on the information contained in or incorporated by reference in this prospectus supplement and the accompanying prospectus. We have not, and the underwriters have not, authorized anyone to provide you with different information. If anyone provides you with different or inconsistent information, you should not rely on it. We are not, and the underwriters are not, making 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, the accompanying prospectus, and the documents incorporated by reference in this prospectus supplement and the accompanying prospectus, is accurate only as of the date of those respective documents. Our business, financial condition, results of operations and prospects may have changed since those dates. Unless required by law, we undertake no obligation to update or revise any forward-looking statements to reflect new information or future events or developments.

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Use of Proceeds

We estimate that the net proceeds from the sale of the shares of common stock and warrants to purchase shares of common stock that we are offering will be approximately $, or approximately $ if the underwriters exercise in full their option to purchase up to additional shares of common stock and/or additional warrants to purchase shares of common stock, after deducting the underwriting discount and estimated offering expenses payable by us.

We currently intend to use the estimated net proceeds from this offering to fund ongoing clinical trials and for general corporate purposes. We believe these proceeds, together with our existing cash, will be sufficient to fund operations through anticipated filing of our HDE application relating to our *Neuro-Spinal Scaffold*.

Our management will have significant discretion and flexibility in applying the net proceeds from the sale of these securities. Pending any use, as described above, we intend to invest the net proceeds in high-quality, short-term, interest-bearing securities.

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Dilution

Our net tangible book value as of December 31, 2015 was $16.9 million, or $0.61 per share. Net tangible book value per share is determined by dividing our total tangible assets, less total liabilities, by the number of shares of our common stock outstanding as of December 31, 2015. Dilution with respect to net tangible book value per share represents the difference between the amount per share paid by purchasers of shares of common stock (excluding shares of common stock issuable upon exercise of the warrants being offered) in this offering and the net tangible book value per share of our common stock immediately after this offering.

After giving effect to the sale of units in this offering (excluding shares of common stock issuable upon exercise of the warrants being offered in this offering) at the public offering price of $ per unit and after deducting the underwriting discount and estimated offering expenses payable by us, our as adjusted net tangible book value as of December 31, 2015 would have been approximately $, or $ per share. This represents an immediate increase in net tangible book value of $ per share to existing stockholders and immediate dilution of $ per share to investors in this offering. The following table illustrates this dilution on a per share basis:

Public offering price per unit		$
Net tangible book value per share as of December 31, 2015	$ 0.61	
Increase in net tangible book value per share attributable to investors in this offering	$	
As adjusted net tangible book value per share as of December 31, 2015 after giving effect to this offering		$
Dilution per share to investors in this offering		$

If the underwriters exercise in full their option to purchase up to additional shares of common stock, the as adjusted net tangible book value after this offering would be $ per share, representing an increase in net tangible book value of $ per share to existing stockholders and immediate dilution of $ per share to investors in this offering.

The number of shares of our common stock to be outstanding immediately after this offering as shown above is based on 27,555,948 shares outstanding as of December 31, 2015, and excludes as of that date:

- 1,156,779 shares of our common stock issuable upon exercise of warrants, having a weighted average exercise price of $5.71 per share;
- 3,253,310 shares of our common stock issuable upon exercise of outstanding stock options, having a weighted average exercise price of $7.47 per share;
- 3,524,946 shares of our common stock reserved for future issuances under our incentive compensation plans and 401(k) plan;
- 180,552 shares of common stock reserved for future sale under our employee stock purchase plan; and
- shares of common stock issuable upon exercise of warrants to be issued in this offering.

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As of December 31, 2015, our 2014 Warrants were exercisable for 395,716 shares of common stock for an exercise price of $5.75 per share. The exercise price and the number of shares issuable upon exercise of the 2014 Warrants are subject to adjustment in the event of sales of our common stock at a price per share less than the exercise price of the 2014 Warrants then in effect (or securities convertible or exercisable into common stock at a conversion or exercise price less than the exercise price then in effect). The determination of whether common stock was sold at a price below the exercise price of the 2014 Warrants is made pursuant to a formula set forth in the 2014 Warrants which, among other things, assigns value to warrants issued in a unit transaction. Upon consummation of this offering, we anticipate that the exercise price of our outstanding 2014 Warrants will be adjusted downwards from $5.75 to $ per share and that the 2014 Warrants will be exercisable for shares of our common stock.

To the extent that outstanding options or warrants outstanding as of December 31, 2015 have been or may be exercised or other shares are issued, investors purchasing our common stock 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.

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Capitalization

The following table sets forth our cash and cash-equivalents and our capitalization as of December 31, 2015 as follows:

On an actual basis; and

On an as-adjusted basis to give effect to our issuance and sale of units in this offering at a public offering price of $ per unit, after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us, assuming no exercise of the underwriters' over-allotment option and excluding the proceeds, if any, from the exercise of warrants issued pursuant to this offering.

You should read the information in the following table in conjunction with our consolidated financial statements and the related notes and the section entitled "Management's Discussion and Analysis of Financial Condition and Results of Operations" contained in our Annual Report on Form 10-K for the year ended December 31, 2015 filed with the SEC and incorporated by reference in this prospectus supplement and the accompanying prospectus.

	As of December 31, 2015	
(In thousands, except share and per share information)	**Actual**	**As adjusted for this offering**
Cash and cash equivalents (1)	$ 20,194	$
Current portion of long-term debt	$ 395	$ 395
Long-term debt, net of current portion	$ 1,275	$ 1,275
Stockholders' equity		
Common stock, $0.00001 par value; 50,000,000 shares authorized, 27,555,948 shares issued and outstanding, actual; shares issued and outstanding as adjusted	$ 1	$
Additional paid-in capital	$ 150,497	$
Accumulated deficit	(133,569)	(133,569)
Total stockholders' equity	$ 16,929	$ 16,929
Total capitalization	$ 18,599	$

(1) Does not include $361 in restricted cash, which represents a security deposit related to the Company's credit card account and a standby letter of credit in favor of a landlord.

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Description of our Securities

We are offering units, consisting of an aggregate of &nb