

INVIVO THERAPEUTICS HOLDINGS CORP.

Form 424B5

January 29, 2015

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Filed Pursuant to Rule 424(b)(5)
Registration No. 333-188573

PROSPECTUS SUPPLEMENT
(To Prospectus dated May 22, 2013)

8,000,000 Shares of Common Stock

Pursuant to this prospectus supplement and the accompanying prospectus, we are offering 8,000,000 shares of our common stock at a price of \$1.50 per share to certain institutional investors. Our common stock is quoted on the OTCQB under the symbol "NVIV." The last reported sale price of our common stock on January 28, 2015 was \$2.19 per share.

Investing in our securities involves a high degree of risk. See "Risk Factors" beginning on page S-7 of this prospectus supplement and on page 2 of the accompanying prospectus and the documents incorporated by reference herein for a discussion of information that should be considered in connection with an investment in our securities.

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

We have retained H.C. Wainwright & Co., LLC to act as our placement agent in connection with the shares of common stock offered by this prospectus supplement. The placement agent has agreed to use its "reasonable best efforts" to arrange for the sale of the common stock offered by this prospectus supplement. We have agreed to pay the placement agent the placement agent fees set forth in the table below, which assumes that we sell all of the common stock we are offering.

| | Per Share | Total |
|----------------------------------|------------------|--------------|
| Offering price | \$1.5000 | \$12,000,000 |
| Placement agent fees (1) | \$0.1050 | \$840,000 |
| Proceeds, before expenses, to us | \$1.3950 | \$11,160,000 |

- (1) We have also agreed to reimburse the placement agent for certain of its expenses in connection with this offering, as further described in the "Plan of Distribution."

H.C. Wainwright & Co.

The date of this prospectus supplement is January 28, 2015.

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About This Prospectus Supplement

This prospectus supplement and the accompanying prospectus relate to a registration statement (No. 333-188573) that we filed with the Securities and Exchange Commission (the "SEC") using a "shelf" registration process. Under this shelf registration process, we may, from time to time, sell up to \$100 million in the aggregate of common stock, warrants to purchase common stock or units, units comprised of common stock and warrants, or any combination of the foregoing securities.

This prospectus supplement and the accompanying prospectus provide specific information about the offering by us of our common stock under the shelf registration statement. This document is in two parts. The first part is this prospectus supplement, which describes the terms of this offering of common stock 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 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 placement agent has 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 placement agent is 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 pioneering biomaterials and biotechnology company with a focus on the treatment of spinal cord injuries. Our proprietary technologies incorporate intellectual property that is licensed under our exclusive, world-wide license from Children's Medical Center Corporation and the Massachusetts Institute of Technology, as well as intellectual property that has been developed internally in collaboration with our advisors and partners. At September 30, 2014, we were considered a "development stage enterprise" and will continue to be so until we commence commercial operations. A development stage enterprise is one in which planned principal operations have not commenced or, if its operations have commenced, there has been no significant revenue from operations. Development stage companies report cumulative costs from the date of inception of the enterprise.

Our development stage started on November 28, 2005 and continued through September 30, 2014. As of September 30, 2014, we have experienced total net losses since inception of approximately \$91,870,000. As a development stage enterprise, we expect to incur substantial operating losses in the future and are therefore dependent upon external financing, such as from equity and debt offerings, to finance our operations. Before we can derive revenue or cash inflows from the commercialization of any of our products, we will need to conduct clinical studies and obtain regulatory approval to commercialize our products.

Overall, we expect our research and development (R&D) expenses to be substantial and to increase for the foreseeable future as we continue the development and clinical investigation of our current and future products. However, expenditures on R&D programs are subject to many uncertainties, including whether we develop our products with a partner or independently, or whether we develop or acquire products and product candidates. At this time, due to the uncertainties and inherent risks involved in our development stage business, we cannot estimate in a meaningful way the duration of, or the costs to complete, our R&D programs or whether, when or to what extent we will generate revenues or cash inflows from the commercialization and sale of any of our products. While we are currently focused on advancing the development of our Neuro-Spinal Scaffold, our future R&D expenses will depend on the determinations we make as to the scientific and clinical prospects of each potential product, as well as our ongoing assessment of the regulatory requirements and each product's commercial potential. In addition, we may make acquisitions of businesses, technologies or intellectual property rights that we believe would be necessary, useful or complementary to our current business. Any investment made in a potential acquisition could affect our results of operations and reduce our limited capital resources, and any issuance of equity securities in connection with a potential acquisition could be substantially dilutive to our stockholders.

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Recent Developments

Pilot Study Update

Our investigational degradable polymer Neuro-Spinal Scaffold is currently being studied in an early feasibility, five subject pilot study under our approved Investigational Device Exemption (IDE) application for the treatment of complete traumatic acute spinal cord injury. The U.S. Food and Drug Administration (the "FDA") approved the study which is intended to capture 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.

The pilot study was initially approved for up to six clinical sites across the United States, and as of October 2014, the number of allowable clinical sites was expanded to up to 20. The FDA also approved various changes to the protocol for the study related to the broadening of the study's eligibility criteria. In October 2014, we also announced that the first subject was enrolled in our pilot study at the Barrow Neurological Institute in Phoenix, Arizona. Under the conditions of the FDA's approval of our IDE application, our pilot study was initially staggered such that each patient that meets the eligibility criteria would be followed for three months prior to enrolling the next patient in the study. In December 2014, barring significant safety issues, the FDA approved an expedited enrollment plan. In January 2015, about three months after the first subject was enrolled, we opened enrollment and our second subject was enrolled subsequently thereafter. We intend to submit one month of safety data for that subject to the FDA together with the previous subject's data, and we will then be able to have concurrent enrollment for the remaining three subjects. There will be no additional mandatory holds between enrollment of the final three subjects.

We anticipate full enrollment of five patients in the pilot study in 2015. If our pilot study is successful, we then expect to conduct a pivotal study to show safety and probable benefit in order to obtain FDA approval to commence commercialization under a Humanitarian Device Exemption (HDE). We currently expect the pivotal study will begin in 2016, with estimated completion in 2017. However, even if we are able to obtain FDA approval of our Neuro-Spinal Scaffold, because the Neuro-Spinal Scaffold is new, unproven technology, we will have to demonstrate the clinical utility of the product and gain acceptance from physicians and obtain third party reimbursement for our product and there can be no assurance that we will be able to do so. For major markets outside the United States, we would be required to seek regulatory approvals in those markets after the clinical studies or trials are conducted in the United States.

Preliminary Results for the Year Ended December 31, 2014

Although our financial statements as of and for the year ended December 31, 2014 are not yet available, the following information reflects our estimates of our results based on currently available information.

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For the year ended December 31, 2014, we expect to report the following results:

(in millions, except for per share amounts)

| | Estimated | Actual |
|---|-------------------|-------------------|
| | 12/31/2014 | 12/31/2013 |
| Balance Sheet Data | | |
| Cash | \$13.9 | \$14.0 |
| Warrant Liability | \$7.0-7.5 | |
| Stockholders' Equity | \$5.2-5.6 | \$12.9 |
| Statement of Operations | | |
| Research & Development | \$9.2-9.6 | \$10.5 |
| General & Administrative | \$8.6-9 | \$8.5 |
| Total Operating Expenses | \$18.0-18.5 | \$19.0 |
| Derivative Loss (including Modification of Warrants) | \$(0.2)-(0.5) | \$(19.6) |
| Net Loss | \$(18.5)-(18.9) | \$(38.6) |
| Net Loss per Share, Basic and Diluted | \$(0.21)-(0.22) | \$(0.52) |
| Weighted Average Number of Common Shares Outstanding, Basic and Diluted | 88.3 | 74.0 |

Research and development expenses are expected to decline by \$0.9-\$1.3 million from 2013 levels. The decline is predominately due to the reduction in force that occurred in the second quarter of 2014. General and administrative costs are expected to experience a modest increase from 2013. The increase is due to higher stock compensation and business development expenses offset by lower headcount costs related to the reduction in force that occurred in the second quarter of 2014. The derivative liability change from 2013 is primarily driven by the warrant call completed in 2013.

The foregoing constitute forward-looking statements and should be read in light of the section of this prospectus supplement entitled "Special Note Regarding Forward-Looking Information." These preliminary results are unaudited and represent our estimates only, and our actual results could differ materially from those set forth above as a result of various factors, including those listed under "Risk Factors" in this prospectus supplement and in the accompanying prospectus. In addition, these factors include, without limitation, the risk that additional information may arise during our close process or as a result of subsequent events that would require us to make adjustments to the financial information, as well as the risk that adjustments to our financial statements may be identified through the course of our independent registered public accounting firm completing its review of our financial statements.

Other Matters

On January 9, 2015, we received a subpoena from the Boston Regional Office of the Securities and Exchange Commission, informing us that the Securities and Exchange Commission is conducting an investigation of the company. The subpoena requests corporate documents from us, including corporate, financial, and employee information, communications or correspondence, related to Francis Reynolds, our former Chairman, Chief Executive Officer and Chief Financial Officer, Sean Moran, our former acting Chief Financial Officer, and certain other corporate events. We intend to cooperate with the Securities and Exchange Commission in its investigation.

On August 21, 2014, we received a subpoena from the Enforcement Section of the Massachusetts Securities Division of the Office of the Secretary of the Commonwealth, informing us that it is conducting a private investigation of certain activities of the company and Francis Reynolds, our former Chairman, Chief Executive Officer and Chief Financial Officer, that occurred prior to September 2013. We intend to cooperate with the Massachusetts Securities Division in its investigation.

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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 at One Kendall Square, Suite B14402, Cambridge, Massachusetts 02139, and our telephone number is (617) 863-5500. Our website is 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 | 8,000,000 shares of common stock |
| Offering price | \$1.50 per share |
| Common stock outstanding before this offering | 93,547,062 shares of common stock outstanding, as of September 30, 2014 |
| Common stock to be outstanding after this offering | 101,547,062 shares of common stock |
| Use of proceeds | We intend to use the net proceeds from the common stock offered hereby for general corporate purposes. See "Use of Proceeds" on page S-9. |
| Risk factors | Investing in our securities involves significant risks. See "Risk Factors" on page S-7. |
| OTCQB symbol | NVIV |

The number of shares of our common stock to be outstanding immediately after this offering is based on 93,547,062 shares outstanding, as of September 30, 2014, and does not include, as of that date:

10,208,849 shares of our common stock issuable upon the exercise of outstanding warrants at a weighted average exercise price of \$1.43 per share;

8,901,655 shares of our common stock issuable upon the exercise of outstanding stock options at a weighted average exercise price of \$1.76 per share; and

4,294,800 shares of our common stock reserved for future issuances under our incentive compensation plans and 401(k) plan.

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Risk Factors

An investment in our securities involves a high degree of risk. Before deciding whether to invest in our securities, you should consider carefully the risks described below and discussed under the section captioned "Risk Factors" beginning on page 2 of the accompanying prospectus, together with other information in this prospectus supplement, the accompanying prospectus, and the documents incorporated by reference in this prospectus supplement and the accompanying prospectus. If any of these risks actually occurs, our business, financial condition or results of operations could be seriously harmed. This could cause the trading price of our common stock to decline, resulting in a loss of all or part of your investment.

Risks Related to This Offering

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" in this prospectus supplement for more information. 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 and substantial 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 \$1.26 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.

Our stockholders may experience significant dilution as a result of future equity offerings or issuances and exercise of outstanding options and warrants.

In order to raise additional capital or pursue strategic transactions, we may in the future offer, issue or sell additional shares of our common stock or other securities convertible into or exchangeable for our common stock. We cannot assure you that we will be able to sell shares or other securities in any other transaction at a price per share that is equal to or greater than the price per share paid by investors in this offering, and investors purchasing shares or other securities in the future could have rights superior to existing stockholders. The price per share at which we sell or issue additional shares of our common stock or other securities convertible into or exchangeable for our common stock in future transactions may be higher or lower than the price per share in this offering.

In addition, we have a significant number of securities convertible into, or allowing the purchase of, our common stock, including, as of September 30, 2014, 10,208,849 shares of common stock issuable upon exercise of outstanding warrants, 8,901,655 shares of our common stock issuable upon the exercise of outstanding stock options, and 4,294,800 shares of our common stock reserved for future issuances under our incentive compensation plans and 401(k) plan.

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.

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The market price of our common stock may be volatile, and the value of your investment could decline significantly.

The trading price for our common stock has been, and we expect it to continue to be, volatile. The price at which our common stock trades depends upon a number of factors, including actual or anticipated variations in our operating results, announcements of developments by us or our competitors, the completion and/or results of our clinical trials, regulatory actions regarding our products, announcements by us of significant acquisitions, strategic partnerships or joint ventures, and general market and economic conditions. Some of these factors are beyond our control. Broad market fluctuations may lower the market price of our common stock and affect the volume of trading in our stock, regardless of our financial condition, results of operations, business or prospects. It is impossible to assure you that the market price of our shares of common stock will not fall in the future.

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 (the "Securities Act"), and Section 21E of the Securities Exchange Act of 1934, as amended (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 ability to raise substantial additional capital to finance our planned operations;
- 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," "will," "should," "could," "would," "expects," "plans," "anticipates," "believes," "estimates," "projects," "predicts," "potential" 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

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documents by these cautionary statements. 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.

Use of Proceeds

We estimate that the net proceeds from this offering will be approximately \$11 million, after deducting estimated placement agent fees and estimated offering expenses payable by us.

We currently intend to use the estimated net proceeds from this offering for working capital purposes, including for the research, development and pre-clinical studies for our product candidates, the completion of the pilot clinical study of our Neuro-Spinal Scaffold, and a potential pivotal study.

We have not yet determined the amount of net proceeds to be used specifically for any of the foregoing purposes. Accordingly, 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.

Dilution

If you purchase shares in this offering, your ownership interest will be diluted to the extent of the difference between the offering price per share and the net tangible book value per share of our common stock after this offering. Our net tangible book value as of September 30, 2014 was \$13.5 million, or \$0.14 per share of common stock. We calculate net tangible book value per share by dividing the net tangible book value, which is tangible assets less total liabilities, by the number of outstanding shares of our common stock.

After giving effect to the sale by us of 8,000,000 shares of our common stock in this offering at the offering price of \$1.50 per share, and after deducting \$840,000 of placement agent fees and \$155,000 of other estimated offering expenses payable by us, our net tangible book value as of September 30, 2014 would have been approximately \$24.5 million, or \$0.24 per share of common stock. This amount represents an immediate increase in net tangible book value of \$0.10 per share to existing stockholders and an immediate dilution of \$1.26 per share to the investors in this offering.

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

| | |
|--|---------|
| Offering price per share | \$ 1.50 |
| Net tangible book value per share as of September 30, 2014 | \$ 0.14 |
| Increase in net tangible book value per share after this offering | \$ 0.10 |
| Pro forma net tangible book value per share after giving effect to this offering | \$ 0.24 |
| Dilution per share to the new investors in this offering | \$ 1.26 |

The above table is based on 93,547,062 shares outstanding, as of September 30, 2014, and does not include, as of that date:

10,208,849 shares of our common stock issuable upon the exercise of outstanding warrants at a weighted average exercise price of \$1.43 per share;

8,901,655 shares of our common stock issuable upon the exercise of outstanding stock options at a weighted average exercise price of \$1.76 per share; and

4,294,800 shares of our common stock reserved for future issuances under our incentive compensation plans and 401(k) plan.

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Because there is no minimum offering amount required as a condition to the closing of this offering, the dilution per share to new investors may be more than that indicated above in the event that the actual

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number of shares sold, if any, is less than the maximum number of shares of our common stock we are offering.

Description of Securities

In this offering, we are offering up to 8,000,000 shares of common stock. The material terms and provisions of our common stock are described under the caption "Description of Common Stock" starting on page 4 of the accompanying prospectus.

Plan of Distribution

Pursuant to an engagement letter agreement dated as of December 10, 2014, we have engaged H.C. Wainwright & Co., LLC ("H.C. Wainwright") as our placement agent for this offering. H.C. Wainwright is not purchasing or selling any shares, nor are they required to arrange for the purchase and sale of any specific number or dollar amount of shares, other than to use their "reasonable best efforts" to arrange for the sale of shares by us. Therefore, we may not sell the entire amount of shares being offered. H.C. Wainwright may engage one or more sub-placement agents or selected dealers to assist with the offering.

Upon the closing of this offering, we will pay the placement agent a cash transaction fee equal to seven percent (7%) of the gross proceeds to us from the sale of the shares in the offering. We will reimburse H.C. Wainwright for its expenses incurred in connection with this offering in an amount equal to one percent (1%) of the aggregate gross proceeds raised in the offering, not to exceed \$50,000.

We have entered into a securities purchase agreement on January 28, 2015 directly with the investors who agree to purchase the shares of common stock in this offering. The engagement letter and the securities purchase agreement provides that the obligations of H.C. Wainwright and the investors are subject to certain conditions precedent, including, among other things, the absence of any material adverse change in our business and the receipt of certain opinions, letters and certificates from us or our counsel, as applicable.

We currently anticipate that the closing of this offering will take place on or about January 29, 2015. On the closing date, the following will occur:

we will receive funds in the amount of the aggregate purchase price;

H.C. Wainwright, as the placement agent, will receive the placement agent fees in accordance with the terms of the engagement letter; and

we will deliver the shares of our common stock to the investors.

The following table shows the per share and total placement agent fees we will pay in connection with the sale of common stock pursuant to this prospectus supplement, assuming the purchase of all of the shares of common stock in this offering:

| | |
|-----------|-----------|
| Per share | \$0.1050 |
| Total | \$840,000 |

Following the completion of this offering, we have granted the placement agent a right of first refusal, subject to certain exemptions, to act as (i) lead manager, lead placement agent or lead agent with respect to the financing or refinancing of any indebtedness, or (ii) sole underwriter or sole placement agent in connection with any public offering or a private placement of equity or debt securities by us. This right of first refusal extends for three months from the date this offering is consummated.

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We have agreed to indemnify the placement agent against certain liabilities under the Securities Act of 1933, as amended. The placement agent may be deemed to be an underwriter within the meaning of Section 2(a)(11) of the Securities Act and any commissions received by it and any profit realized on the sale of the securities by it while acting as principal might be deemed to be underwriting discounts or commissions under the Securities Act. The placement agent will be required to comply with the requirements of the Securities Act and the Exchange Act, including, without limitation, Rule 10b-5 and Regulation M under the Exchange Act. These rules and regulations may limit the timing of purchases and sales of our securities by the placement agent. Under these rules and regulations, the placement agent may not (i) engage in any stabilization activity in connection with our securities; and (ii) bid for or purchase any of our securities or attempt to induce any person to purchase any of our securities, other than as permitted under the Exchange Act, until they have completed their participation in the distribution.

The transfer agent for our common stock is Continental Stock Transfer & Trust Company.

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Legal Matters

Greenberg Traurig, LLP, Boston, Massachusetts, will pass on the validity of the shares of common stock offered by this prospectus supplement and the accompanying prospectus. Ellenoff Grossman & Schole LLP, New York, New York, is counsel for the placement agent in connection with this offering.

Experts

The consolidated balance sheets of InVivo Therapeutics Holdings Corp. as of December 31, 2013 and 2012, and the related consolidated statements of operations, changes in stockholders' deficit and cash flows for the years then ended and for the period from November 28, 2005 (inception) to December 31, 2013 have been audited by Wolf & Company, P.C., an independent registered public accounting firm, as indicated in their report with respect thereto, and are incorporated by reference herein in reliance upon the authority of said firm as experts in accounting and auditing.

Where You Can Find More Information

This prospectus supplement and the accompanying prospectus are part of the registration statement on Form S-3 we filed with the SEC under the Securities Act and do not contain all the information set forth in the registration statement. Whenever a reference is made in this prospectus supplement or the accompanying prospectus to any of our contracts, agreements or other documents, the reference may not be complete and you should refer to the exhibits that are a part of the registration statement or the exhibits to the reports or other documents incorporated by reference in this prospectus supplement and the accompanying prospectus for a copy of such contract, agreement or other document. Because we are subject to the information and reporting requirements of the Exchange Act, 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 <http://www.sec.gov>. You may also read and copy any document we file at the SEC's Public Reference Room at 100 F Street, N.E., Washington, D.C. 20549. Please call the SEC at 1-800-SEC-0330 for further information on the operation of the Public Reference Room. Copies of certain information filed by us with the SEC are also available on our website at www.invivotherapeutics.com. The information available on or through our website is not part of this prospectus supplement or the accompanying prospectus and should not be relied upon.

Incorporation of Certain Information by Reference

The SEC allows us to "incorporate by reference" information from other documents that we file with it, which means that we can disclose important information to you by referring you to those documents. The information incorporated by reference is considered to be part of this prospectus supplement and the accompanying prospectus. Information contained in this prospectus supplement and the accompanying prospectus and information that we file with the SEC in the future and incorporate by reference in this prospectus supplement and the accompanying prospectus will automatically update and supersede this information. We incorporate by reference the documents listed below and any future filings (other than Current Reports on Form 8-K furnished under Item 2.02 or Item 7.01 and exhibits filed on such form that are related to such items) we make with the SEC under Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act after the date of the prospectus supplement and before the sale of all the securities covered by this prospectus supplement:

Our Annual Report on Form 10-K for the fiscal year ended December 31, 2013, filed on March 17, 2014, as amended on April 29, 2014;

Our Quarterly Report on Form 10-Q for the quarter ended March 31, 2014, filed on May 12, 2014;

Our Quarterly Report on Form 10-Q for the quarter ended June 30, 2014, filed on August 6, 2014;

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Our Quarterly Report on Form 10-Q for the quarter ended September 30, 2014, filed on November 5, 2014;

Our Current Reports on Form 8-K filed on April 30, May 6 (Items 1.01 and 9.01), May 19, May 30, June 23, July 31, August 5, September 29, November 12 and December 9, 2014; and

The description of our common stock contained in our Registration Statement on Form 8-A filed on June 30, 2006, including any amendments or reports filed for the purpose of updating such description.

The documents incorporated by reference in this prospectus are available from us upon request. We will provide a copy of any and all of the information that is incorporated by reference in this prospectus to any person, without charge, upon written or oral request. Exhibits to our SEC filings will not be sent, however, unless those exhibits have specifically been incorporated by reference in this prospectus.

You may request a copy of these filings, at no cost, by writing or calling us at the following address or telephone number:

InVivo Therapeutics Holdings Corp.
One Kendall Square, Suite B14402
Cambridge, Massachusetts 02139
Attn: Investor Relations
(617) 863-5500

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PROSPECTUS

INVIVO THERAPEUTICS HOLDINGS CORP.

\$100,000,000

Common Stock Warrants Units

This prospectus relates to common stock, warrants and units that we may sell from time to time in one or more offerings up to a total dollar amount of \$100,000,000 on terms to be determined at the time of sale. We will provide specific terms of these securities in supplements to this prospectus. You should read this prospectus and any supplement carefully before you invest. This prospectus may not be used to offer and sell securities unless accompanied by a prospectus supplement for those securities.

Our common stock is quoted on the OTC Bulletin Board under the symbol "NVIV." On May 10, 2013, the last sales price of our common stock as reported on the OTC Bulletin Board was \$3.00 per share.

These securities may be sold directly by us, through dealers or agents designated from time to time, to or through underwriters or through a combination of these methods. See "Plan of Distribution" in this prospectus. We may also describe the plan of distribution for any particular offering of these securities in any applicable prospectus supplement. If any agents, underwriters or dealers are involved in the sale of any securities in respect of which this prospectus is being delivered, we will disclose their names and the nature of our arrangements with them in a prospectus supplement. The net proceeds we expect to receive from any such sale will also be included in a prospectus supplement.

Investing in our securities involves a high degree of risk. Beginning on page 2, we discuss several "Risk Factors " that you should consider before investing in our securities.

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

The date of this prospectus is May 22, 2013.

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ABOUT THIS PROSPECTUS

This prospectus is part of a registration statement that we filed with the Securities and Exchange Commission, or the SEC, using a "shelf" registration process. Under this shelf registration process, we may sell any combination of the securities described in this prospectus in one or more offerings up to a total dollar amount of \$100,000,000. This prospectus provides you with a general description of the securities we may offer. Each time we sell securities, we will provide a prospectus supplement that will contain specific information about the securities being offered and the terms of that offering. The prospectus supplement may also add to, update or change information contained in this prospectus. You should read both this prospectus and any prospectus supplement together with the additional information described under the heading "Where You Can Find More Information" carefully before making an investment decision.

You should rely only on the information contained or incorporated by reference in this prospectus or any applicable prospectus supplement. We have not authorized any other person to provide you with different information. If anyone provides you with different or inconsistent information, you should not rely on it. We are not making an offer to sell these securities in any jurisdiction where the offer or sale is not permitted.

You should not assume that the information appearing in this prospectus or any applicable prospectus supplement is accurate as of any date other than the date on the front cover of this prospectus or the applicable prospectus supplement, or that the information contained in any document incorporated by reference is accurate as of any date other than the date of the document incorporated by reference, regardless of the time of delivery of this prospectus or any prospectus supplement or any sale of a security. Our business, financial condition, results of operations and prospects may have changed since such dates.

Unless the context otherwise requires, the terms "InVivo," "the Company," "our company," "we," "us," "our" and similar names refer collectively to InVivo Therapeutics Holdings Corp. and its subsidiaries.

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ABOUT INVIVO THERAPEUTICS HOLDINGS CORP.

We develop and commercialize new technologies for the treatment of spinal cord injuries. Our proprietary technology was co-invented by Robert S. Langer, ScD, Professor at Massachusetts Institute of Technology ("MIT") and Joseph P. Vacanti, MD, affiliated with Massachusetts General Hospital. The intellectual property rights that are the basis for our products are licensed under an exclusive, world-wide license from Children's Medical Center Corporation and MIT.

We intend to create new treatments for spinal cord injuries. Current treatments consist of a collection of approaches that only focus on symptoms of spinal cord injury. To date, we are not aware of any product on the market that addresses the underlying pathology of spinal cord injury.

Currently, there are no successful spinal cord injury treatment options for spinal cord injury patients. We take a different approach to spinal cord injury and focus on protection of the spinal cord and prevention of secondary injury rather than regeneration. Our platform technologies focus on minimizing tissue damage sustained following acute injury and promoting neural plasticity of the spared healthy tissue, which may result in full or partial functional recovery. The technologies encompass multiple strategies involving biomaterials, U.S. Food & Drug Administration approved drugs, growth factors, and human neural stem cells. We believe our approach could become a standard treatment for both acute and chronic spinal cord injuries.

We intend to leverage our primary platform technology to develop and commercialize several products as follows:

A biocompatible polymer scaffolding device to treat acute spinal cord injuries.

Biocompatible hydrogels for use as: dural sealants, dural replacements, nerve conduits and for local controlled release of methylprednisolone to treat spinal cord injuries and peripheral nerve injuries.

A biocompatible polymer scaffolding device seeded with autologous human neural stem cells to treat acute and chronic spinal cord injuries.

InVivo Therapeutics Corporation was incorporated on November 28, 2005 under the laws of the State of Delaware and on October 26, 2010 completed a reverse merger transaction with and became a wholly-owned subsidiary of InVivo Therapeutics Holdings Corporation, a company incorporated under the laws of the State of Nevada.

Our principal executive offices are located at One Kendall Square, Suite B14402, Cambridge, Massachusetts 02139, and our telephone number is (617) 863-5500. Our worldwide web address is www.invivotherapeutics.com. The information on our web site is not incorporated by reference into this prospectus and should not be considered to be part of this prospectus.

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RISK FACTORS

Investing in our securities involves significant risks. Please see the risk factors under the heading "Risk Factors" in our most recent Annual Report on Form 10-K, as revised or supplemented by our Quarterly Reports on Form 10-Q filed with the SEC since the filing of our most recent Annual Report on Form 10-K, each of which are on file with the SEC and are incorporated by reference in this prospectus. Before making an investment decision, you should carefully consider these risks as well as other information we include or incorporate by reference in this prospectus and any prospectus supplement. The risks and uncertainties we have described are not the only ones facing our company. Additional risks and uncertainties not presently known to us or that we currently deem immaterial may also affect our business operations.

WHERE YOU CAN FIND MORE INFORMATION

We file annual, quarterly and current reports, proxy statements and other information with the SEC. You may read and copy any document we file at the SEC's public reference room at 100 F Street, N.E., Washington, DC 20549. You should call 1-800-SEC-0330 for more information on the operation of the public reference room. Our SEC filings are also available to you on the SEC's Internet site at www.sec.gov.

This prospectus is part of a registration statement that we filed with the SEC. This prospectus does not contain all of the information included in the registration statement, including certain exhibits and schedules. You can obtain a copy of the registration statement and exhibits from the SEC at the address listed above or from the SEC's Internet site.

Our Internet address is www.invivotherapeutics.com. The information on our Internet website is not incorporated by reference in this prospectus or any prospectus supplement.

SPECIAL NOTE REGARDING FORWARD-LOOKING INFORMATION

This prospectus and each prospectus supplement includes and incorporates forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended (the "Securities Act"), and Section 21E of the Securities Exchange Act of 1934, as amended (the "Exchange Act"). All statements, other than statements of historical facts, included or incorporated in this prospectus or any prospectus supplement regarding our strategy, future operations, financial position, future revenues and earnings, projected margins and expenses, prospects, potential acquisitions or strategic alliances, plans and objectives of management are forward-looking statements. The words "anticipates," "believes," "estimates," "expects," "intends," "may," "plans," "projects," "will," "would" and similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain these identifying words. We cannot guarantee that we actually will achieve the plans, intentions or expectations disclosed in our forward-looking statements and you should not place undue reliance on our forward-looking statements. There are a number of important factors that could cause our actual results to differ materially from those indicated by these forward-looking statements. These important factors include the factors that we identify in the documents we incorporate by reference in this prospectus, as well as other information we include or incorporate by reference in this prospectus and any prospectus supplement. Please see the factors described under the heading "Risk Factors" of this prospectus. You should read these factors and other cautionary statements made in this prospectus and any accompanying prospectus supplement, and in the documents we incorporate by reference as being applicable to all related forward-looking statements wherever they appear in the prospectus and any accompanying prospectus supplement, and in the documents incorporated by reference. We do not assume any obligation to update any forward-looking statements made by us.

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INCORPORATION OF CERTAIN INFORMATION BY REFERENCE

The SEC allows us to "incorporate" into this prospectus information and reports that we file with the SEC. This means that we can disclose important information to you by referring to other documents that contain that information. Any information that we incorporate by reference is considered part of this prospectus. The documents and reports that we list below are incorporated by reference into this prospectus, other than any portion of any such documents that are not deemed "filed" under the Exchange Act in accordance with the Exchange Act and applicable SEC rules.

In addition, all documents and reports which we file pursuant to Section 13(a), 13(c), 14 or 15(d) of the Exchange Act after the date of this prospectus and prior to the termination of the offering made hereby are incorporated by reference in this prospectus as of the respective filing dates of these documents and reports.

We have filed the following documents with the SEC. These documents are incorporated herein by reference as of their respective dates of filing:

- (1) Our Annual Report on Form 10-K for the fiscal year ended December 31, 2012, filed on March 12, 2013;
- (2) Our Quarterly Report on Form 10-Q for the quarter ended March 31, 2013, filed on May 9, 2013;
- (3) Our Current Report on Form 8-K filed on April 17, 2013;
- (4) All of our filings pursuant to the Exchange Act after the date of filing the initial registration statement and prior to the effectiveness of the registration statement; and
- (5) The description of our common stock contained in our Registration Statement on Form 8-A filed on June 30, 2006, including any amendments or reports filed for the purpose of updating such description.

You may request a copy of these documents, which will be provided to you at no cost, by writing or telephoning us at:

InVivo Therapeutics Holdings Corp.
One Kendall Square, Suite B14402
Cambridge, Massachusetts 02139
Attn: Investor Relations
(617) 863-5500

Statements contained in documents that we file with the SEC and that are incorporated by reference in this prospectus will automatically update and supersede information contained in this prospectus, including information in previously filed documents or reports that have been incorporated by reference in this prospectus, to the extent the new information differs from or is inconsistent with the old information. Any statement so modified or superseded will not be deemed to be a part of this prospectus or any prospectus supplement, except as so modified or superseded. Because information that we later file with the SEC will update and supersede previously incorporated information, you should look at all of the SEC filings that we incorporate by reference to determine if any of the statements in this prospectus or any prospectus supplement or in any documents previously incorporated by reference have been modified or superseded.

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USE OF PROCEEDS

We currently intend to use the estimated net proceeds from the sale of these securities for general corporate purposes, which may include the following:

the research, development and pre-clinical and clinical trials for our product candidates;

the acquisition of other companies, businesses, products or technologies;

the repayment and refinancing of debt;

capital expenditures;

working capital; and

any other purpose that we may specify in any prospectus supplement.

We have not yet determined the amount of net proceeds to be used specifically for any of the foregoing purposes. Accordingly, 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. Our plans to use the estimated net proceeds from the sale of these securities may change, and if they do, we will update this information in a prospectus supplement.

THE SECURITIES WE MAY OFFER

The descriptions of the securities contained in this prospectus, together with the applicable prospectus supplements, summarize the material terms and provisions of the various types of securities that we may offer. We will describe in the applicable prospectus supplement relating to any securities the particular terms of the securities offered by that prospectus supplement. If we so indicate in the applicable prospectus supplement, the terms of the securities may differ from the terms we have summarized below. We will also include in the prospectus supplement information, where applicable, about material United States federal income tax considerations relating to the securities, and the securities exchange, if any, on which the securities will be listed.

We may sell from time to time, in one or more offerings:

common stock;

warrants to purchase common stock or units;

units comprised of common stock and warrants; or

any combination of the foregoing securities.

In this prospectus, we refer to the common stock, warrants and units collectively as "securities." The total dollar amount of all securities that we may issue will not exceed \$100,000,000.

This prospectus may not be used to consummate a sale of securities unless it is accompanied by a prospectus supplement.

DESCRIPTION OF COMMON STOCK

The following is a description of the material terms and provisions of our common stock. It may not contain all the information that is important to you. You can access complete information by referring to our articles of incorporation and bylaws.

Under our articles of incorporation, we have authority to issue 200,000,000 shares of common stock, par value \$0.00001 per share. As of March 31, 2013, there were 66,193,229 shares of common stock issued and outstanding. All shares of common stock will, when issued, be duly authorized, fully

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paid and nonassessable. Accordingly, the full price for the outstanding shares of common stock will have been paid at issuance and any holder of our common stock will not be later required to pay us any additional money for such common stock.

In addition, as of March 31, 2013:

there were outstanding warrants to purchase an aggregate of up to 15,400,787 shares of our common stock at a weighted average exercise price of \$1.36 per share;

there were an aggregate of 9,495,626 shares of our common stock subject to outstanding stock options at a weighted average exercise price of \$1.40 per share; and

1,512,042 shares of our common stock were reserved for future issuances under our incentive compensation plans and 401(k) plan.

The holders of common stock are entitled to one vote per share on all matters submitted to a vote of the stockholders, including the election of directors. Generally, all matters to be voted on by stockholders must be approved by a majority (or, in the case of election of directors, by a plurality) of the votes entitled to be cast by all shares of common stock that are present in person or represented by proxy. Except as otherwise provided by law, amendments to the articles of incorporation generally must be approved by a majority of the votes entitled to be cast by all outstanding shares of common stock. Our articles of incorporation do not provide for cumulative voting in the election of directors. The holders of common stock will be entitled to such cash dividends as may be declared from time to time by the Board from funds available. The holders of common stock have no preferential or preemptive right and no subscription, redemption or conversion privileges with respect to the issuance of additional shares of our common stock. Upon liquidation, dissolution or winding up of the Company, the holders of common stock will be entitled to receive pro rata all assets available for distribution to such holders after payment of our liabilities.

Registrar and Transfer Agent

The registrar and transfer agent for our common stock is Continental Stock Transfer & Trust Company.

Trading Market

Our common stock is quoted on the OTC Bulletin Board under the symbol "NVIV."

DESCRIPTION OF WARRANTS

We may issue warrants for the purchase of common stock or units. Warrants may be issued independently or together with common stock or units, and the warrants may be attached to or separate from such securities. We may issue warrants directly or under a warrant agreement to be entered into between us and a warrant agent. We will name any warrant agent in the applicable prospectus supplement. Any warrant agent will act solely as our agent in connection with the warrants of a particular series and will not assume any obligation or relationship of agency or trust for or with any holders or beneficial owners of warrants.

The following is a description of the general terms and provisions of any warrants we may issue and may not contain all the information that is important to you. You can access complete information by referring to the applicable prospectus supplement. In the applicable prospectus supplement, we will describe the terms of the warrants and any applicable warrant agreement, including, where applicable, the following:

the title of the warrants;

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the offering price and aggregate number of warrants offered;

the designation and terms of the securities with which the warrants are issued and the number of warrants issued with each such security;

the date on and after which the warrants and the related securities will be separately transferable;

any information with respect to book-entry procedures;

in the case of warrants to purchase common stock or units, the number of shares of common stock or units, as the case may be, purchasable upon the exercise of one warrant and the price at which these securities may be purchased upon such exercise;

the effect of any merger, consolidation, sale or other disposition of our business on the warrant agreement and the warrants;

the terms of any rights to redeem or call the warrants;

any provisions for changes to or adjustments in the exercise price or number of securities issuable upon exercise of the warrants;

the dates on which the right to exercise the warrants will commence and expire;

the manner in which the warrant agreement and warrants may be modified;

a discussion of any material U.S. federal income tax considerations of holding or exercising the warrants;

the terms of the securities issuable upon exercise of the warrants; and

any other specific terms, preferences, rights or limitations of or restrictions on the warrants.

DESCRIPTION OF UNITS

The following description, together with the additional information we include in any applicable prospectus supplement, summarizes the material terms and provisions of the units that we may offer under this prospectus. Units may be offered independently or together with common stock and warrants offered by any prospectus supplement, and may be attached to or separate from those securities.

While the terms we have summarized below will generally apply to any future units that we may offer under this prospectus, we will describe the particular terms of any series of units that we may offer in more detail in the applicable prospectus supplement. The terms of any units offered under a prospectus supplement may differ from the terms described below.

We will incorporate by reference into the registration statement of which this prospectus is a part the form of unit agreement, including a form of unit certificate, if any, that describes the terms of the series of units we are offering before the issuance of the related series of units. The

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following summaries of material provisions of the units and the unit agreements are subject to, and qualified in their entirety by reference to, all the provisions of the unit agreement applicable to a particular series of units. We urge you to read the applicable prospectus supplements related to the units that we sell under this prospectus, as well as the complete unit agreements that contain the terms of the units.

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General

We may issue units consisting of common stock and warrants. 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, including the following:

the designation and 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 provisions of the governing unit agreement that differ from those described below; and

any provisions for the issuance, payment, settlement, transfer, or exchange of the units or of the securities comprising the units.

The provisions described in this section, as well as those described under "Description of Common Stock," and "Description of Warrants," will apply to each unit and to the common stock and warrants included in each unit, respectively.

Issuance in Series

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

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, without the consent of the related unit agent or the holder of any other unit, may enforce by appropriate legal action its rights as holder under any security included in the unit.

Title

We, the unit agent, and any of their agents may treat the registered holder of any unit certificate as an absolute owner of the units evidenced by that certificate for any purposes and as the person entitled to exercise the rights attaching to the units so requested, despite any notice to the contrary.

**CERTAIN ANTI-TAKEOVER AND INDEMNIFICATION PROVISIONS OF
OUR ARTICLES OF INCORPORATION, BY-LAWS AND NEVADA LAW**

Anti-Takeover Effects of Provisions of Nevada State Law

We may be or in the future we may become subject to Nevada's control share laws. A corporation is subject to Nevada's control share law if it has more than 200 stockholders, at least 100 of whom are stockholders of record and residents of Nevada, and if the corporation does business in Nevada, including through an affiliated corporation. This control share law may have the effect of discouraging corporate takeovers. We currently have less than 100 stockholders of record who are residents of Nevada.

The control share law focuses on the acquisition of a "controlling interest," which means the ownership of outstanding voting shares that would be sufficient, but for the operation of the control

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share law, to enable the acquiring person to exercise the following proportions of the voting power of the corporation in the election of directors: (1) one-fifth or more but less than one-third; (2) one-third or more but less than a majority; or (3) a majority or more. The ability to exercise this voting power may be direct or indirect, as well as individual or in association with others.

The effect of the control share law is that an acquiring person, and those acting in association with that person, will obtain only such voting rights in the control shares as are conferred by a resolution of the stockholders of the corporation, approved at a special or annual meeting of stockholders. The control share law contemplates that voting rights will be considered only once by the other stockholders. Thus, there is no authority to take away voting rights from the control shares of an acquiring person once those rights have been approved. If the stockholders do not grant voting rights to the control shares acquired by an acquiring person, those shares do not become permanent non-voting shares. The acquiring person is free to sell the shares to others. If the buyer or buyers of those shares themselves do not acquire a controlling interest, the shares are not governed by the control share law.

If control shares are accorded full voting rights and the acquiring person has acquired control shares with a majority or more of the voting power, a stockholder of record, other than the acquiring person, who did not vote in favor of approval of voting rights, is entitled to demand fair value for such stockholder's shares.

In addition to the control share law, Nevada has a business combination law, which prohibits certain business combinations between Nevada corporations and "interested stockholders" for three years after the interested stockholder first becomes an interested stockholder, unless the corporation's board of directors approves the combination in advance. For purposes of Nevada law, an interested stockholder is any person who is: (a) the beneficial owner, directly or indirectly, of 10% or more of the voting power of the outstanding voting shares of the corporation, or (b) an affiliate or associate of the corporation and at any time within the previous three years was the beneficial owner, directly or indirectly, of 10% or more of the voting power of the then-outstanding shares of the corporation. The definition of "business combination" contained in the statute is sufficiently broad to cover virtually any kind of transaction that would allow a potential acquirer to use the corporation's assets to finance the acquisition or otherwise to benefit its own interests rather than the interests of the corporation and its other stockholders.

The effect of Nevada's business combination law is to potentially discourage parties interested in taking control of the Company from doing so if it cannot obtain the approval of our board of directors.

Anti-Takeover Effects of Provisions of Our Articles of Incorporation and Bylaws

Our articles of incorporation provide for a classified board of directors. This provision could prevent a party who acquires control of a majority of our outstanding common stock from obtaining control of the board until our second annual stockholders meeting following the date the acquirer obtains the controlling stock interest. The classified board provision could have the effect of discouraging a potential acquirer from making a tender offer or otherwise attempting to obtain control of us and could increase the likelihood that incumbent directors will retain their positions. In addition, under our amended and restated bylaws, directors may be removed only for cause and only by the affirmative vote of the holders of at least 80% of the voting power of our then outstanding shares of capital stock entitled to vote generally in the election of directors, voting together as a single class.

Our amended and restated bylaws also provide that stockholders may only act at meetings of stockholders and not by written consent in lieu of a stockholders' meeting. Our amended and restated bylaws provide that stockholders may not call a special meeting of stockholders. Rather, only the Chairman of our Board, the President or the Board of Directors pursuant to a resolution approved by a majority of the entire Board of Directors are able to call special meetings of stockholders. Our

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amended and restated bylaws also provide that stockholders may only conduct business at special meetings of stockholders that was specified in the notice of the meeting. These provisions may discourage another person or entity from making a tender offer, even if it acquired a majority of our outstanding voting stock, because the person or entity could only take action at a duly called stockholders' meeting relating to the business specified in the notice of meeting and not by written consent.

Indemnification of Directors and Officers

Nevada Revised Statutes ("NRS") Sections 78.7502 and 78.751 provide us with the power to indemnify any of our directors, officers, employees and agents. The person entitled to indemnification must have conducted himself in good faith, and must reasonably believe that his conduct was in, or not opposed to, our best interests. In a criminal action, the director, officer, employee or agent must not have had reasonable cause to believe that his conduct was unlawful.

Under NRS Section 78.751, advances for expenses may be made by agreement if the director or officer affirms in writing to repay the expenses if it is determined that such officer or director is not entitled to be indemnified.

Our bylaws include an indemnification provision under which we have the power to indemnify our directors, officers, former directors and officers, employees and other agents (including heirs and personal representatives) against all costs, charges and expenses actually and reasonably incurred, including an amount paid to settle an action or satisfy a judgment to which a director or officer is made a party by reason of being or having been a director or officer of the Company. Our bylaws further provide for the advancement of all expenses incurred in connection with a proceeding upon receipt of an undertaking by or on behalf of such person to repay such amounts unless it is determined that the party is entitled to be indemnified under our bylaws. No advance will be made by the Company to a party if it is determined that the party acted in bad faith. These indemnification rights are contractual, and as such will continue as to a person who has ceased to be a director, officer, employee or other agent, and will inure to the benefit of the heirs, executors and administrators of such a person. Our bylaws do not eliminate or limit the liability of a director for: (i) an act or omission which involves intentional misconduct, fraud or a knowing violation of law; or (ii) the payment of dividends in violation of NRS 78.300. These provisions may be sufficiently broad to indemnify such persons for liabilities arising under the Securities Act, in which case such provision is against public policy as expressed in the Securities Act and is therefore unenforceable.

We maintain an insurance policy on behalf of our directors and officers, covering certain liabilities which may arise as a result of the actions of the directors and officers.

We have entered into an indemnification agreement with each of our officers and directors pursuant to which they will be indemnified by us, subject to certain limitations, for any liabilities incurred by them in connection with their role as officers and/or directors of the Company.

PLAN OF DISTRIBUTION

We may sell the securities being offered hereby in one or more of the following ways from time to time:

directly to investors;

through agents to the public or to investors;

directly to agents;

to one or more underwriters or dealers for resale to the public or to investors;

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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, or an exchange or otherwise; or

through a combination of any of these methods of sale.

The securities that we distribute by any of these methods may be sold, in one or more transactions, at:

a fixed price or prices, which may be changed;

market prices prevailing at the time of sale;

prices related to prevailing market prices; or

negotiated prices.

We will set forth in a prospectus supplement the terms of the offering of our securities, including:

the name or names of any agents or underwriters;

the purchase price of our securities being offered and the proceeds we will receive from the sale;

any over-allotment options under which underwriters may purchase additional securities from us;

any agency fees or underwriting discounts and commissions and other items constituting agents' or underwriters' compensation;

any public offering price;

any discounts or concessions allowed or reallocated or paid to dealers; and

any securities exchanges on which such common stock may be listed.

Underwriters

Underwriters, dealers and agents that participate in the distribution of the securities may be underwriters as defined in the Securities Act and any discounts or commissions they receive from us and any profit on their resale of the securities may be treated as underwriting discounts and commissions under the Securities Act. We will identify in the applicable prospectus supplement any underwriters, dealers or agents and will describe their compensation. In no event will the aggregate value of compensation received or to be received by Financial Industry Regulatory Authority members or independent broker-dealers exceed 8% for the sale of the securities registered hereunder. We may have agreements with the underwriters, dealers and agents to indemnify them against specified civil liabilities, including liabilities under the Securities Act. Underwriters, dealers and agents may engage in transactions with or perform services for us or our subsidiaries in the ordinary course of their businesses.

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If we use underwriters for a sale of securities, the underwriters will acquire the securities for their own account. The underwriters may resell the securities in one or more transactions, including negotiated transactions, at a fixed public offering price or at varying prices determined at the time of sale. The obligations of the underwriters to purchase the securities will be subject to the conditions set forth in the applicable underwriting agreement. The underwriters will be obligated to purchase all the securities offered if they purchase any of the securities offered. We may change from time to time any initial public offering price and any discounts or concessions the underwriters allow or reallow or pay to dealers. We may use underwriters with whom we have a material relationship. We will describe in the prospectus supplement naming the underwriters the nature of any such relationship.

If indicated in the applicable prospectus supplement, we will authorize underwriters or other persons acting as our agents to solicit offers by particular institutions to purchase securities from us at

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the public offering price set forth in such prospectus supplement pursuant to delayed delivery contracts providing for payment and delivery on the date or dates stated in such prospectus supplement. Each delayed delivery contract will be for an amount no less than, and the aggregate principal amounts of securities sold under delayed delivery contracts shall be not less nor more than, the respective amounts stated in the applicable prospectus supplement. Institutions with which such contracts, when authorized, may be made include commercial and savings banks, insurance companies, pension funds, investment companies, educational and charitable institutions and others, but will in all cases be subject to our approval. The obligations of any purchaser under any such contract will be subject to the conditions that (a) the purchase of the securities shall not at the time of delivery be prohibited under the laws of any jurisdiction in the United States to which the purchaser is subject, and (b) if the securities are being sold to underwriters, we shall have sold to the underwriters the total principal amount of the securities less the principal amount thereof covered by the contracts. The underwriters and such other agents will not have any responsibility in respect of the validity or performance of such contracts.

Agents

We may designate agents who agree to use their reasonable efforts to solicit purchases for the period of their appointment or to sell securities on a continuing basis.

Direct Sales

We may also sell securities directly to one or more purchasers without using underwriters or agents. We may also make direct sales through subscription rights distributed to our shareholders on a pro rata basis, which may or may not be transferable. In any distribution of subscription rights to shareholders, if all of the underlying securities are not subscribed for, we may then sell the unsubscribed securities directly to third parties or may engage the services of one or more underwriters, dealers or agents, including standby underwriters, to sell the unsubscribed securities to third parties.

Trading Markets and Listing of Securities

Unless otherwise specified in the applicable prospectus supplement, each class or series of securities will be a new issue with no established trading market, other than our common stock, which is quoted on the OTC Bulletin Board. We may elect to list any other class or series of securities on any exchange, but we are not obligated to do so. It is possible that one or more underwriters may make a market in a class or series of securities, but the underwriters will not be obligated to do so and may discontinue any market making at any time without notice. We cannot give any assurance as to the liquidity of the trading market for any of the securities.

Stabilization Activities

In connection with an offering, an underwriter may purchase and sell securities in the open market. These transactions may include short sales, stabilizing transactions and purchases to cover positions created by short sales. Short sales involve the sale by the underwriters of a greater number of securities than they are required to purchase in the offering. "Covered" short sales are sales made in an amount not greater than the underwriters' option to purchase additional securities from us, if any, in the offering. If the underwriters have an over-allotment option to purchase additional securities from us, the underwriters may close out any covered short position by either exercising their over-allotment option or purchasing securities in the open market. In determining the source of securities to close out the covered short position, the underwriters may consider, among other things, the price of securities available for purchase in the open market as compared to the price at which they may purchase securities through the over-allotment option. "Naked" short sales are any sales in excess of such option or where the underwriters do not have an over-allotment option. The underwriters must close out any naked short position by purchasing securities in the open market. A naked short position is more likely

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to be created if the underwriters are concerned that there may be downward pressure on the price of the securities in the open market after pricing that could adversely affect investors who purchase in the offering.

Accordingly, to cover these short sales positions or to otherwise stabilize or maintain the price of the securities, the underwriters may bid for or purchase securities in the open market and may impose penalty bids. If penalty bids are imposed, selling concessions allowed to syndicate members or other broker-dealers participating in the offering are reclaimed if securities previously distributed in the offering are repurchased, whether in connection with stabilization transactions or otherwise. The effect of these transactions may be to stabilize or maintain the market price of the securities at a level above that which might otherwise prevail in the open market. The impositions of a penalty bid may also effect the price of the securities to the extent that it discourages resale of the securities. The magnitude or effect of any stabilization or other transactions is uncertain. These transactions may be effected on the OTC Bulletin Board or otherwise and, if commenced, may be discontinued at any time.

EXPERTS

Our balance sheets as of December 31, 2012 and 2011, and the related statements of operations, changes in stockholders' deficit and cash flows for the years then ended and for the period from November 28, 2005 (inception) to December 31, 2012 have been included herein and in the registration statement in reliance upon the report of Wolf & Company, P.C., independent registered public accountants, appearing elsewhere herein, and upon the authority of said firm as experts in accounting and auditing.

LEGAL MATTERS

Certain legal matters, including the legality of the securities offered, will be passed upon for us by our counsel, Greenberg Traurig, LLP, Boston, Massachusetts. If the securities are distributed in an underwritten offering, certain legal matters will be passed upon for the underwriters by counsel identified in the applicable prospectus supplement.

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INVIVO THERAPEUTICS HOLDINGS CORP.

8,000,000 Shares of Common Stock

Prospectus Supplement

January 28, 2015

H.C. WAINWRIGHT & CO., LLC
