

INVIVO THERAPEUTICS HOLDINGS CORP.

Form 424B3

April 30, 2012

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Filed Pursuant to Rule 424(b)(3)
Registration No. 333-171998

PROSPECTUS

26,047,200 Shares of Common Stock

INVIVO THERAPEUTICS HOLDINGS CORP.

This prospectus relates to the following offerings by certain of our stockholders and warrant holders, which we refer to as Selling Securityholders :

the resale of up to 12,848,600 shares of common stock purchased in a private placement;

the resale of up to 12,848,600 shares of common stock that are issuable on exercise of the investor warrants that were acquired in a private placement; and

the resale of up to 350,000 shares of common stock that are issuable on exercise of the new bridge warrants that were issued to warrant holders in connection with our merger in 2010.

Holders of the investor warrants and new bridge warrants may currently purchase one share of common stock for each warrant exercised. The exercise price and number of shares of common stock issuable upon exercise of the warrants is subject to further adjustment in certain circumstances.

We will not receive any proceeds from the sale of these securities, although we will receive the exercise price for any warrants that are exercised. We are registering securities for resale by the Selling Securityholders, but that does not necessarily mean that they will sell any of the securities. The Selling Securityholders, or their pledgees, donees, transferees or other successors-in-interest, may offer the shares from time to time through public or private transactions, at prevailing market prices, at prices related to prevailing market prices or at privately negotiated prices.

The investor warrants and the new bridge warrants are exercisable at \$1.40 per share and \$1.00 per share, respectively, at any time on or before the fifth anniversary of the date of issuance.

Our common stock is currently available for trading in the over-the-counter market and is quoted on the OTC Bulletin Board under the symbol NVIV.OB . The last sale price of our common stock on March 13, 2012 was \$2.49.

Investing in our common stock involves a high degree of risk. We urge you to carefully read the section entitled Risk Factors beginning on page 3 of this prospectus and all other information included or incorporated by reference in this prospectus in its entirety before you decide whether to buy our common stock.

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

The date of this prospectus is April 23, 2012.

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ABOUT THIS PROSPECTUS

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

We and the Selling Securityholders have not authorized any dealer, salesman or other person to give any information or to make any representation other than those contained or incorporated by reference in this prospectus, any accompanying prospectus supplements or any free writing prospectus delivered by or on behalf of us. You must not rely upon any information or representation not contained or incorporated by reference in this prospectus, any accompanying prospectus supplements or any free writing prospectus delivered by or on behalf of us. This prospectus does not constitute an offer to sell or the solicitation of an offer to buy any securities other than the registered securities to which it relates. The Selling Securityholders are offering to sell, and seeking offers to buy, shares of our common stock, but only under circumstances and in jurisdictions where it is lawful to do so. The information contained in this prospectus is accurate only as of the date on the front of this prospectus and any information we have incorporated by reference in this prospectus is accurate only as of the date of the document incorporated by reference, regardless of the time of delivery of this prospectus or any sale of our common stock. Our business, financial condition, results of operations, and prospects may have changed since those dates.

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PROSPECTUS SUMMARY

This summary highlights information contained elsewhere in this prospectus or incorporated by reference therein. This summary may not contain all of the information that you should consider before deciding whether or not you should invest in our common stock. You should read the entire prospectus carefully, including the section entitled "Risk Factors" beginning on page 3 of this prospectus and all other information included or incorporated herein by reference in its entirety before you decide whether to invest in our common stock.

InVivo Therapeutics Holdings Corp.

Business Overview

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, 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 (CMCC) and Massachusetts Institute of Technology (MIT).

We intend to create new treatments for spinal cord injury. 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 (FDA) 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.

A biocompatible hydrogel for local controlled release of methylprednisolone to treat acute 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.

Our biopolymer-based devices are surgically implanted or injected into the lesion created during traumatic injury, or the primary injury. We expect the biopolymer scaffolding devices will protect the damaged spinal cord by mitigating the progression of secondary injury resulting from the body's inflammatory and immune response to injury, and will promote neuroplasticity, a process where functional recovery (the recovery of motor movement or sensation) may occur through the rerouting of signaling pathways to the spared healthy tissue. Achieving these results is essential to the recovery process, as secondary injury can significantly worsen the immediate damage sustained during trauma. The additional damage dramatically reduces patient quality of life post-injury.

Our first product, the biocompatible polymer scaffolding device to treat acute spinal cord injuries is expected to be regulated by the FDA as a Class III medical device. A Class III medical device will require FDA approval of a Pre-Market Approval Application (PMA) before we can start selling the product in the U.S. We will be required to demonstrate safety and efficacy in human clinical studies before we can submit a PMA to the FDA. Before clinical studies can commence, we must submit an Investigational Device Exemption application (IDE) to the FDA and the FDA must approve the IDE. Once the IDE has been filed with the FDA, the FDA has a thirty-day period to approve the IDE, or disapprove the IDE, in which case the applicant is provided the opportunity to provide additional information to the FDA to respond to the filing deficiencies. We have conducted a Pre-IDE meeting with the FDA at which we reviewed the pre-clinical data and the clinical trial protocol. At the meeting, the FDA provided us observations and guidance concerning the pre-clinical data required for the IDE submission, the description of the manufacturing methods used to make the device and the proposed clinical study protocol.

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We submitted an IDE application for our biopolymer scaffolding device to the FDA on July 7, 2011. The FDA has provided us with comments to the IDE filing and we are in the process of responding to the FDA comments. We

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anticipate that the IDE will be approved by the FDA during 2012, but we can give no assurance that the IDE will be approved. We plan to first conduct a pilot study in ten acute spinal cord patients followed by a larger pivotal study. The completion of the human clinical studies and the FDA approval of the PMA could take between three to five years to achieve, depending on a number of factors including the FDA review and clearance process for the IDE, the clinical trial designs and amount of time it will take to enroll and treat patients, and the FDA review and approval process for the PMA. The FDA regulatory approval process is lengthy, and the outcome is highly uncertain. The risk exists that the first product may never be approved, or that the approval is significantly delayed such that we are unable to raise additional capital to continue to fund the Company.

If the product is approved by the FDA, we will need to expand manufacturing capacity, and establish sales, marketing and distribution channels to sell the product. We intend to retain manufacturing rights and plan to market and sell the product through a direct sales force in the United States. For major markets outside the United States, we plan to seek regulatory approvals after the clinical trials are conducted in the United States.

Additional applications of our platform technologies include the potential treatment for spinal cord injury following tumor removal, peripheral nerve damage, and postsurgical treatment of any transected nerve. Our first product, the biocompatible scaffolding device for the treatment of acute spinal cord injury, is regulated as a Class III medical device by the FDA. The product has been evaluated in a number of animal studies, including a third primate study which began in 2011. The data collected from this study is intended to support results from previous pre-clinical studies. The study includes 24 additional primates utilizing the same trial design as the second African green monkey study. Initial results are consistent with data from prior monkey and rodent studies. The biocompatible hydrogel for the local release of methylprednisolone to treat acute spinal cord and peripheral nerve injuries and the biocompatible polymer scaffolding device seeded with autologous human neural stem cells to treat acute and chronic spinal cord injuries are likely to be regulated as combination drug/devices and as such will require significantly longer regulatory approval times than the biopolymer scaffolding device.

We are a development stage company, and as such face significant uncertainty regarding our future capital needs and timelines for our intended products.

Corporate Information

InVivo Therapeutics Corporation (InVivo Corporation) was incorporated on November 28, 2005 under the laws of the State of Delaware. On October 26, 2010, InVivo Corporation completed a reverse merger transaction (the Merger) with InVivo Therapeutics Holdings Corp. (formerly Design Source, Inc.), a publicly traded company incorporated under the laws of the State of Nevada. As a result of the Merger, InVivo Corporation became a wholly owned subsidiary of InVivo Therapeutics Holdings Corp., which continues to operate the business of InVivo Corporation.

Our principal executive offices are located at One Broadway, 14th Floor, Cambridge, Massachusetts 02142. Our telephone number is (617) 475-1520. 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.

Relevant Transactions

Simultaneously with the Merger, concurrently with the conversion of all other equity securities of InVivo Corporation into our equity securities, all of the issued and outstanding bridge warrants to purchase shares of InVivo Corporation's common stock, converted, respectively, into new bridge warrants (the New Bridge Warrants) to purchase shares of our common stock. The number of shares of common stock issuable under, and the price per share upon exercise of, the New Bridge Warrants were calculated based on the terms of the warrants of InVivo Corporation, as adjusted by the conversion ratio in the Merger. As a result of the Merger, among other things, New Bridge Warrants for the purchase of 600,000 shares of common stock were issued to holders of outstanding InVivo warrants. The New Bridge Warrants are exercisable at a price of \$1.00 per share.

In connection with the Merger, on October 26, November 10 and December 3, 2010, we completed a private offering of 13,000,000 units of our securities (Units), at a price of \$1.00 per Unit. Each Unit consisted of one share of common stock and a warrant to purchase one share of common stock. The warrants (the Investor Warrants) are exercisable for a period of five years at a purchase price of \$1.40 per share of Common Stock.

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RISK FACTORS

Investing in our common stock involves a high degree of risk. You should carefully consider the specific risks described in our filings with the SEC pursuant to Sections 13(a), 13(c), 14, or 15(d) of the Securities Exchange Act of 1934, as amended (the Exchange Act), that are incorporated herein by reference before making an investment decision. See the section of this prospectus entitled Where You Can Find More Information. Any of the risks we describe in the information incorporated herein by reference could cause our business, financial condition, or operating results to suffer. The market price of our common stock could decline if one or more of these risks and uncertainties develop into actual events. You could lose all or part of your investment. Please also refer to the section of this prospectus entitled Cautionary Note Regarding Forward-Looking Statements.

CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus and the documents we have filed with the SEC that are incorporated by reference into this 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 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:

the progress, timing and results of pre-clinical and clinical trials and research and development efforts involving our product candidates;

the submission of applications for and receipt of regulatory clearances and approvals;

our ability to commercialize our product candidates;

our business strategy and our expectations with respect to the implementation of our business strategy;

our expectations with respect to the potential therapeutic and commercial value of our product candidates;

the benefits we expect to derive from relationships with our collaborators;

our expectations with respect to our intellectual property position; and

our estimates regarding our capital requirements and our need for additional financing.

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 represent 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 3 of this 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 and the documents we have filed with the SEC that are incorporated by reference into this 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. We 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 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 and the documents incorporated by reference in this 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. Thus, you should not assume that our silence over time means that actual events are bearing out as expressed or implied in such forward-looking statements.

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USE OF PROCEEDS

We will not receive any proceeds from the sale of shares by the Selling Securityholders. The Selling Securityholders will pay any underwriting discounts and commissions and expenses incurred by the Selling Securityholders for brokerage, accounting, tax or legal services or any other expenses incurred by the Selling Securityholders in disposing of the shares. We will bear all other costs, fees and expenses incurred in effecting the registration of the shares covered by this prospectus, including, without limitation, all registration and filing fees and fees and expenses of our counsel and our accountants.

We may receive gross proceeds of up to \$18,700,000, before deducting expenses estimated at \$20,000, from the exercise of the Investor Warrants and New Bridge Warrants. We will retain discretion over the use of the net proceeds we may receive from such exercises, but we currently intend to use such proceeds, if any, for general corporate and for working capital purposes.

SELLING SECURITYHOLDERS

Below is information with respect to the beneficial ownership of our securities by the Selling Securityholders as of July 18, 2011. Except as described below, the Selling Securityholders do not have, or have had, any position, office or other material relationship with us or any of our affiliates beyond their investment in, or receipt of, our securities. Beneficial ownership has been determined in accordance with the rules of the SEC, and includes voting or investment power with respect to the securities. Our registration of these securities does not necessarily mean that the Selling Securityholders will sell any or all of the securities covered by this prospectus.

We are registering 26,047,200 shares of common stock underlying the Units, the Investor Warrants and the New Bridge Warrants, issued to the Selling Securityholders, in each case, for resale from time to time by the Selling Securityholders identified in this prospectus.

The information set forth in the following table regarding the beneficial ownership after the offering of securities assumes that the Selling Securityholder will purchase the maximum number of shares of common stock provided for by the Investor Warrants and New Bridge Warrants and will sell all of the shares of common stock owned by that Selling Securityholder covered by this prospectus. There is no assurance that any of the warrants will be exercised.

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| Name | Securities Beneficially Owned Prior to the Offering | | Securities Offered Hereby Common Stock | | Securities Beneficially Owned After this Offering | |
|---|---|----------|--|------------------------|---|----------|
| | Common | Warrants | Common | underlying Warrants | Common Stock | Warrants |
| | Stock(1) | | Stock | | | |
| John E. Dell | 651,400 | 801,400 | 651,400 | 801,400 | | |
| Lester Petracca | 650,000 | 650,000 | 650,000 | 650,000 | | |
| Jerome Z. Ginsburg | 600,000 | 600,000 | 600,000 | 600,000 | | |
| Richard Neustadter | 500,000 | 500,000 | 500,000 | 500,000 | | |
| Gibralt Capital Corp.(2) | 500,000 | 500,000 | 500,000 | 500,000 | | |
| Dr. Jan Arnett | 400,000 | 400,000 | 400,000 | 400,000 | | |
| Craig Whited | 350,000 | 350,000 | 350,000 | 350,000 | | |
| Mark Tompkins | 300,000 | 300,000 | 300,000 | 300,000 | | |
| John Derby | 250,000 | 250,000 | 250,000 | 250,000 | | |
| Edward M. Dunn | 250,000 | 250,000 | 250,000 | 250,000 | | |
| Craig A.T. Jones | 250,000 | 250,000 | 250,000 | 250,000 | | |
| Michael E. Pauly & Patricia R. Pauly JTWROS | 250,000 | 250,000 | 250,000 | 250,000 | | |
| Ralph Pastore | 250,000 | 250,000 | 250,000 | 250,000 | | |
| RRC Bio Fund LP(3) | 250,000 | 250,000 | 250,000 | 250,000 | | |
| Daniel Salvas | 250,000 | 250,000 | 250,000 | 250,000 | | |
| Michael Willis and Sharon Willis JTWROS | 200,000 | 200,000 | 200,000 | 200,000 | | |
| White Rock Capital Partners, LP(4) | 200,000 | 200,000 | 200,000 | 200,000 | | |
| Paul J. Kilgallon | 200,000 | 200,000 | 200,000 | 200,000 | | |
| Ligi Realty Limited Partnership(5) | 200,000 | 200,000 | 200,000 | 200,000 | | |
| Wealth Concepts LLC(6) | 200,000 | 200,000 | 200,000 | 200,000 | | |
| Kevin Carnahan | 200,000 | 200,000 | 200,000 | 200,000 | | |
| James Byron Moore III | 145,000 | 145,000 | 145,000 | 145,000 | | |
| Bonanno Family Partnership LLP(7) | 125,000 | 125,000 | 125,000 | 125,000 | | |
| Jon O Connor | 125,000 | 125,000 | 125,000 | 125,000 | | |
| Harry L. Shufflebarger Revocable Trust(8) | 125,000 | 125,000 | 125,000 | 125,000 | | |
| ACP X, LP(9) | 100,000 | 100,000 | 100,000 | 100,000 | | |

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| Name | Securities Beneficially Owned Prior to the Offering | | Securities Offered Hereby | | Securities Beneficially Owned After this Offering | |
|--|---|----------|---------------------------|---------------------|---|----------|
| | Common Stock(1) | Warrants | Common Stock | underlying Warrants | Common Stock | Warrants |
| | | | | | | |
| Harvey Arbesman and Marian C. Arbesman JTWROS | 100,000 | 100,000 | 100,000 | 100,000 | | |
| Fairfield Investment Group LLC(10) | 100,000 | 100,000 | 100,000 | 100,000 | | |
| Kaaren L. Finnieston | 100,000 | 100,000 | 100,000 | 100,000 | | |
| Andrew Fisher | 100,000 | 100,000 | 100,000 | 100,000 | | |
| Sean Fitzpatrick | 100,000 | 100,000 | 100,000 | 100,000 | | |
| Dean G. Holland and Annette B. Holland JTWROS | 100,000 | 100,000 | 100,000 | 100,000 | | |
| John D. Long | 100,000 | 100,000 | 100,000 | 100,000 | | |
| Michael J. Pierce | 100,000 | 100,000 | 100,000 | 100,000 | | |
| QIP Holdings LLC(11) | 100,000 | 100,000 | 100,000 | 100,000 | | |
| Nadine Smith | 100,000 | 100,000 | 100,000 | 100,000 | | |
| FMTC as Custodian FBO Thomas C. Stephens Roth IRA | 100,000 | 100,000 | 100,000 | 100,000 | | |
| Garretson B. Trudeau | 100,000 | 100,000 | 100,000 | 100,000 | | |
| Jeffrey D. Vaught | 100,000 | 100,000 | 100,000 | 100,000 | | |
| Andrew Brenner | 100,000 | 100,000 | 100,000 | 100,000 | | |
| Banque de Luxembourg Client Account | 100,000 | 100,000 | 100,000 | 100,000 | | |
| George Karfunkel | 100,000 | 100,000 | 100,000 | 100,000 | | |
| Edward S. Rosenthal | 100,000 | 100,000 | 100,000 | 100,000 | | |
| Todd Stuart | 85,794 | 170,794 | 85,794 | 170,794 | | |
| Robert B. Baker | 75,000 | 75,000 | 75,000 | 75,000 | | |
| Erich J. Weidenbener | 75,000 | 75,000 | 75,000 | 75,000 | | |
| Richard Scheffel | 70,000 | 70,000 | 70,000 | 70,000 | | |
| Philip A. Serbin | 70,000 | 70,000 | 70,000 | 70,000 | | |
| Anthony Ameduri | 60,000 | 60,000 | 60,000 | 60,000 | | |
| HRMG Inc. Profit Sharing 401K Plan DTD 7104 FBO James Moore(12) | 55,000 | 55,000 | 55,000 | 55,000 | | |
| Humboldt Radiology Medical Group PSP 401 (K) FBO Donald C. Wheeler(13) | 52,750 | 52,750 | 52,750 | 52,750 | | |
| Andrew Meade | 50,267 | 100,267 | 50,267 | 100,267 | | |
| Lon E. Bell | 50,000 | 50,000 | 50,000 | 50,000 | | |
| FMTC as Custodian FBO Gerald C. Chichester | 50,000 | 50,000 | 50,000 | 50,000 | | |
| Lee Harrison Corbin | 50,000 | 50,000 | 50,000 | 50,000 | | |
| FMTC as Custodian FBO Wendy Flath Roth IRA | 50,000 | 50,000 | 50,000 | 50,000 | | |
| Aubrey W. Gladstone | 50,000 | 50,000 | 50,000 | 50,000 | | |
| Mark Harger | 50,000 | 50,000 | 50,000 | 50,000 | | |
| Daniel W. Hummell & Allaire D. Hummell JTWROS | 50,000 | 50,000 | 50,000 | 50,000 | | |
| Robert Klein | 50,000 | 50,000 | 50,000 | 50,000 | | |

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| Name | Securities Beneficially Owned Prior to the Offering | | Securities Offered Hereby Common Stock | | Securities Beneficially Owned After this Offering | |
|---|---|----------|--|---------------------|---|----------|
| | Common Stock(1) | Warrants | Common Stock | underlying Warrants | Common Stock | Warrants |
| Patrick Lorenz, MD | 50,000 | 50,000 | 50,000 | 50,000 | | |
| Christopher Meyer & Mary Rivet JTWROS | 50,000 | 50,000 | 50,000 | 50,000 | | |
| John Meyer | 50,000 | 50,000 | 50,000 | 50,000 | | |
| Robert L. Montgomery | 50,000 | 50,000 | 50,000 | 50,000 | | |
| Mel Okeon Inc. Profit Sharing Trust(14) | 50,000 | 50,000 | 50,000 | 50,000 | | |
| FMTC as Custodian FBO Edward N. Robinson Roth IRA | 50,000 | 50,000 | 50,000 | 50,000 | | |
| Peter Sabo | 50,000 | 50,000 | 50,000 | 50,000 | | |
| Albert L. Salvatico | 50,000 | 50,000 | 50,000 | 50,000 | | |
| SavoyCapron LLC(15) | 50,000 | 50,000 | 50,000 | 50,000 | | |
| Janea Jones-Schenk and Paul Schenk JTWROS | 50,000 | 50,000 | 50,000 | 50,000 | | |
| FMTC as Custodian FBO Elisabeth A. Stephens IRA | 50,000 | 50,000 | 50,000 | 50,000 | | |
| FMTC as Custodian FBO Michael Stephens Roth IRA | 50,000 | 50,000 | 50,000 | 50,000 | | |
| FMTC as Custodian FBO Thomas B. Stephens IRA | 50,000 | 50,000 | 50,000 | 50,000 | | |
| Richard Weeks | 50,000 | 50,000 | 50,000 | 50,000 | | |
| Edward A. Weidenbener and Mary Lou Weidenbener JTWROS | 50,000 | 50,000 | 50,000 | 50,000 | | |
| Jason Willis | 50,000 | 50,000 | 50,000 | 50,000 | | |
| Paul Tompkins | 50,000 | 50,000 | 50,000 | 50,000 | | |
| Graham Carlton | 50,000 | 50,000 | 50,000 | 50,000 | | |
| Edward Moldaver | 50,000 | 50,000 | 50,000 | 50,000 | | |
| Mitchell L. Lampert | 40,373 | 80,373 | 40,373 | 80,373 | | |
| T. Shawn Hehir | 40,000 | 40,000 | 40,000 | 40,000 | | |
| David Hochman | 37,500 | 37,500 | 37,500 | 37,500 | | |
| CoJack Investment Opportunities, LLC(16) | 30,000 | 30,000 | 30,000 | 30,000 | | |
| Harold S. Gault and Evelyn Gault JTWROS | 30,000 | 30,000 | 30,000 | 30,000 | | |
| John Saraceno | 30,000 | 30,000 | 30,000 | 30,000 | | |
| Mark Saraceno | 30,000 | 30,000 | 30,000 | 30,000 | | |
| Eric M. Scholtz | 30,000 | 30,000 | 30,000 | 30,000 | | |
| Highstone Trust(17) | 30,000 | 30,000 | 30,000 | 30,000 | | |
| Milen Petkov Tzvetanov | 25,363 | 50,363 | 25,363 | 50,363 | | |
| Harold Ackerstein | 25,000 | 25,000 | 25,000 | 25,000 | | |
| Lawrence B. Barraza | 25,000 | 25,000 | 25,000 | 25,000 | | |
| Alan Bilzi | 25,000 | 25,000 | 25,000 | 25,000 | | |
| Bradley Resources Company(18) | 25,000 | 25,000 | 25,000 | 25,000 | | |
| William Clifford | 25,000 | 25,000 | 25,000 | 25,000 | | |
| Timothy Elmes | 25,000 | 25,000 | 25,000 | 25,000 | | |
| Richard Ernest | 25,000 | 25,000 | 25,000 | 25,000 | | |
| Reiner Fenske | 25,000 | 25,000 | 25,000 | 25,000 | | |

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| Name | Securities Beneficially Owned Prior to the Offering | | Securities Offered Hereby Common Stock | | Securities Beneficially Owned After this Offering | |
|--|---|----------|--|---------------------|---|----------|
| | Common | Warrants | Common | underlying Warrants | Common | Warrants |
| | Stock(1) | | Stock | | Stock | |
| Raymond Dale Hautakamaki and Ann Hautamaki JTWROS | 25,000 | 25,000 | 25,000 | 25,000 | | |
| Andrew H. Kaufman | 25,000 | 25,000 | 25,000 | 25,000 | | |
| Douglas P. Kaufman | 25,000 | 25,000 | 25,000 | 25,000 | | |
| Carol Kubiak and Dr. A. Mitarotondo JTWROS | 25,000 | 25,000 | 25,000 | 25,000 | | |
| Barry Render Family Trust(19) | 25,000 | 25,000 | 25,000 | 25,000 | | |
| Vincent G. Scott | 25,000 | 25,000 | 25,000 | 25,000 | | |
| Steven M. Weisman | 25,000 | 25,000 | 25,000 | 25,000 | | |
| Richard White | 25,000 | 25,000 | 25,000 | 25,000 | | |
| Michael Cohen | 25,000 | 25,000 | 25,000 | 25,000 | | |
| Peter C. Gould | 25,000 | 25,000 | 25,000 | 25,000 | | |
| Maurice & Stacy Gozlan TIE | 25,000 | 25,000 | 25,000 | 25,000 | | |
| Donald R. Johnson | 25,000 | 25,000 | 25,000 | 25,000 | | |
| Susan Chase Lottich | 25,000 | 25,000 | 25,000 | 25,000 | | |
| Steven Poletti | 25,000 | 25,000 | 25,000 | 25,000 | | |
| Mark Sainato | 25,000 | 25,000 | 25,000 | 25,000 | | |
| Northlea Partners Ltd.(20) | 25,000 | 25,000 | 25,000 | 25,000 | | |
| Stephen De Kanter | 25,000 | 25,000 | 25,000 | 25,000 | | |
| James W. Dwyer | 25,000 | 25,000 | 25,000 | 25,000 | | |
| Peter M. Knapp Jr. | 25,000 | 25,000 | 25,000 | 25,000 | | |
| Reed S. Oslan | 25,000 | 25,000 | 25,000 | 25,000 | | |
| Henry Rothman | 25,000 | 25,000 | 25,000 | 25,000 | | |
| Robyn Schreiber Irrevocable Trust, Warren Schreiber TTEE | 25,000 | 25,000 | 25,000 | 25,000 | | |
| Joe N. & Jamie Behrendt Revocable | | | | | | |
| Trust 10/20/96(21) | 20,000 | 20,000 | 20,000 | 20,000 | | |
| Rene Beuggert | 20,000 | 20,000 | 20,000 | 20,000 | | |
| Eaglebrook School Special Investment Account(22) | 20,000 | 20,000 | 20,000 | 20,000 | | |
| Field & Field Limited Partnership(23) | 20,000 | 20,000 | 20,000 | 20,000 | | |
| World Equity Group FBO Harold Gault IRA(24) | 20,000 | 20,000 | 20,000 | 20,000 | | |
| Vicki Goggin | 20,000 | 20,000 | 20,000 | 20,000 | | |
| Karen Otto & Gregory Russell JTWROS | 20,000 | 20,000 | 20,000 | 20,000 | | |
| Mark A. Wagner & Karen L. Wagner JTWROS | 20,000 | 20,000 | 20,000 | 20,000 | | |
| Oaktree Financial Group, Inc. Defined Benefit Plan, Michael Balasco TTEE | 20,000 | 20,000 | 20,000 | 20,000 | | |
| Marvin Boehm Family Trust(25) | 20,000 | 20,000 | 20,000 | 20,000 | | |
| Marshall N. Dickler | 20,000 | 20,000 | 20,000 | 20,000 | | |
| David G. Rosen and Julie L. Rosen JTWROS | 20,000 | 20,000 | 20,000 | 20,000 | | |
| Sean Janzer | 20,000 | 20,000 | 20,000 | 20,000 | | |

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| Name | Securities Beneficially Owned Prior to the Offering | | Securities Offered Hereby Common Stock underlying Warrants | | Securities Beneficially Owned After this Offering | |
|---|--|------------|--|------------|---|----------|
| | Common Stock(1) | Warrants | Common Stock | Warrants | Common Stock | Warrants |
| | Barclay M. Armitage | 15,000 | 15,000 | 15,000 | 15,000 | |
| Bruce Cooper | 15,000 | 15,000 | 15,000 | 15,000 | | |
| Souheil Haddad | 15,000 | 15,000 | 15,000 | 15,000 | | |
| WLR Family Partnership, LP(26) | 15,000 | 15,000 | 15,000 | 15,000 | | |
| Richard Bue and Rachel Bue JTWROS | 15,000 | 15,000 | 15,000 | 15,000 | | |
| Philip B. Rosen | 15,000 | 15,000 | 15,000 | 15,000 | | |
| Allen Sessoms | 15,000 | 15,000 | 15,000 | 15,000 | | |
| David Kovacs | 15,000 | 15,000 | 15,000 | 15,000 | | |
| Terence Oi | 12,500 | 12,500 | 12,500 | 12,500 | | |
| Robert Burkhardt | 10,000 | 10,000 | 10,000 | 10,000 | | |
| Kevin Doherty | 10,000 | 10,000 | 10,000 | 10,000 | | |
| Ron Eller & Beth Eller JTWROS | 10,000 | 10,000 | 10,000 | 10,000 | | |
| Beth L. Gottshall | 10,000 | 10,000 | 10,000 | 10,000 | | |
| George Nolen(27) | 10,000 | 10,000 | 10,000 | 10,000 | | |
| Christi M. Pedra(28) | 10,000 | 10,000 | 10,000 | 10,000 | | |
| Timothy Pliske and Sara Pliske JTWROS | 10,000 | 10,000 | 10,000 | 10,000 | | |
| Dennis Pope | 10,000 | 10,000 | 10,000 | 10,000 | | |
| William N. Strawbridge | 10,000 | 10,000 | 10,000 | 10,000 | | |
| N. Michael Wolsonovich, Jr. | 10,000 | 10,000 | 10,000 | 10,000 | | |
| M. Jay Herod | 10,000 | 10,000 | 10,000 | 10,000 | | |
| Aaron Lehmann | 10,000 | 10,000 | 10,000 | 10,000 | | |
| William Martin Roberts | 10,000 | 10,000 | 10,000 | 10,000 | | |
| Ian Stern | 10,000 | 10,000 | 10,000 | 10,000 | | |
| Bruce Levenbrook | 10,000 | 10,000 | 10,000 | 10,000 | | |
| Gerald F. Quinn & Justine M. Quinn JTWROS | 10,000 | 10,000 | 10,000 | 10,000 | | |
| Michael Zimmerman | 10,000 | 10,000 | 10,000 | 10,000 | | |
| Bryan Feinberg | 9,153 | 9,153 | 9,153 | 9,153 | | |
| Athanasios Koukoulis | 7,500 | 7,500 | 7,500 | 7,500 | | |
| Kathleen S. McHugh | 7,500 | 7,500 | 7,500 | 7,500 | | |
| Richard M Spitalny | 7,000 | 7,000 | 7,000 | 7,000 | | |
| Ilan Alon | 5,000 | 5,000 | 5,000 | 5,000 | | |
| O. Stuart Chase | 5,000 | 5,000 | 5,000 | 5,000 | | |
| David Mexicotte | 5,000 | 5,000 | 5,000 | 5,000 | | |
| Thomas N. Gannon | 1,500 | 1,500 | 1,500 | 1,500 | | |
| Totals | 12,848,600 | 13,198,600 | 12,848,600 | 13,198,600 | | |

- (1) Does not include shares of common stock underlying the warrants.
- (2) In accordance with Rule 13d-3 under the Exchange Act, Samuel Belzberg, Jamie Farrar, Ryan Chan and Ryan Dunfield may be deemed control persons of the shares owned by Gibralt Capital Corp., with final voting power and investment control over such shares.
- (3) In accordance with Rule 13d-3 under the Exchange Act, James A. Silverman may be deemed a control person of the shares owned by RRC Bio Fund LP, with final voting power and investment control over such shares.

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- (4) In accordance with Rule 13d-3 under the Exchange Act, Thomas U. Barton and Joseph U. Barton may be deemed control persons of the shares owned by White Rock Capital Partners, LP, with final voting power and investment control over such shares.
- (5) In accordance with Rule 13d-3 under the Exchange Act, Jennifer Ligeti may be deemed a control person of the shares owned by Ligi Realty Limited Partnership, with final voting power and investment control over such shares.
- (6) In accordance with Rule 13d-3 under Exchange Act, Steven Deutsch may be deemed a control person of the shares owned by Wealth Concepts LLC, with final voting power and investment control over such shares.
- (7) In accordance with Rule 13d-3 under the Exchange Act, Raymond Bonanno and Joan Bonanno may be deemed control persons of the shares owned by Bonanno Family Partnership LLP, with final voting power and investment control over such shares.
- (8) In accordance with Rule 13d-3 under the Exchange Act, Harry Shufflebarger and Cynthia Shufflebarger as trustees, may be deemed control persons of the shares owned by Harry L. Shufflebarger Revocable Trust, with final voting power and investment control over such shares.
- (9) In accordance with Rule 13d-3 under the Exchange Act, Laurence G. Allen, as Managing Principal of Allen Partners X, LLC, the General Partner of ACP X, LP, may be deemed a control person of the shares owned by ACP X, LP, with final voting power and investment control over such shares.
- (10) In accordance with Rule 13d-3 under the Exchange Act, Mark Schalles may be deemed a control person of the shares owned by Fairfield Investment Group LLC, with final voting power and investment control over such shares.
- (11) In accordance with Rule 13d-3 under the Exchange Act, Felix A. Gonzalez-Quevedo, as President/Manager, may be deemed a control person of the shares owned by QIP Holdings LLC, with final voting power and investment control over such shares.
- (12) In accordance with Rule 13d-3 under the Exchange Act, James B. Moore, III may be deemed a control person of the shares owned by HRMG Inc. Profit Sharing 401K Plan DTD 7104 FBO James Moore, with final voting power and investment control over such shares.
- (13) In accordance with Rule 13d-3 under the Exchange Act, Donald S. Wheeler may be deemed a control person of the shares owned by Humboldt Radiology Medical Group PSP 401(K) FBO Donald C. Wheeler, with final voting power and investment control over such shares.
- (14) In accordance with Rule 13d-3 under the Exchange Act, Mel Okeon, as trustee, may be deemed a control person of the shares owned by Mel Okeon Inc. Profit Sharing Trust, with final voting power and investment control over such shares.
- (15) In accordance with Rule 13d-3 under the Exchange Act, James Capron, Christopher Bale and Jonathan Green, as members, may be deemed control persons of the shares owned by SavoyCapron LLC, with final voting power and investment control over such shares.
- (16) In accordance with Rule 13d-3 under the Exchange Act, Raymond Dean Hautamaki, as President, may be deemed a control person of the shares owned by CoJack Investment Opportunities, LLC, with final voting power and investment control over such shares.
- (17) In accordance with Rule 13d-3 under the Exchange Act, Ann Beard may be deemed a control person of the shares owned by Highstone Trust, with final voting power and investment control over such shares.
- (18) In accordance with Rule 13d-3 under the Exchange Act, George W. Holbrook, Jr., as Manager, may be deemed a control person of the shares owned by Bradley Resources Company, with final voting power and investment control over such shares.
- (19) In accordance with Rule 13d-3 under the Exchange Act, Barry Render and Donna Render, as trustees, may be deemed control persons of the shares owned by Barry Render Family Trust, with final voting power and investment control over such shares.
- (20) In accordance with Rule 13d-3 under the Exchange Act, John H. Abels may be deemed a control person of the shares owned by Northlea Partners, with final voting power and investment control over such shares.
- (21) In accordance with Rule 13d-3 under the Exchange Act, Joe N. Behrendt, as trustee, may be deemed a control person of the shares owned by Joe N. & Jamie Behrendt Revocable Trust 10/20/96, with final voting power and investment control over such shares.

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- (22) In accordance with Rule 13d-3 under the Exchange Act, O. Stuart Chase may be deemed a control person of the shares owned by Eaglebrook School Special Investment Account, with final voting power and investment control over such shares.
- (23) In accordance with Rule 13d-3 under the Exchange Act, Hyatt M. Field may be deemed a control person of the shares owned by Field & Field Limited Partnership, with final voting power and investment control over such shares.
- (24) In accordance with Rule 13d-3 under the Exchange Act, Harold Gault may be deemed a control person of the shares owned by World Equity Group FBO Harold Gault IRA, with final voting power and investment control over such shares.
- (25) In accordance with Rule 13d-3 under the Exchange Act, Marvin J. Boehm, as trustee may be deemed a control person of the shares owned by Marvin Boehm Family Trust, with final voting power and investment control over such shares.
- (26) In accordance with Rule 13d-3 under the Exchange Act, William McComb, as Managing Partner, may be deemed a control person of the shares owned by WLR Family Partnership, LP, with final voting power and investment control over such shares.
- (27) George Nolen has been a director of the Company since October 2010 and a director of InVivo since December 2009.
- (28) Christi M. Pedra has been a director of the Company since October 2010 and a director of InVivo since November 2008.

PLAN OF DISTRIBUTION

The Selling Securityholders, and any of their pledgees, donees, transferees or other successors-in-interest, may sell the shares from time to time and may also decide not to sell all the shares they are allowed to sell under this prospectus. The Selling Securityholders will act independently of us in making decisions with respect to the timing, manner and size of each sale. The sale of the common stock by any Selling Securityholder, including any donee, pledgee or other transferee who receives common stock from a Selling Securityholder, may be effected from time to time by selling shares directly to purchasers or to or through broker-dealers. In connection with any such sale, any such broker-dealer may act as agent for the Selling Securityholder or may purchase from the Selling Securityholder all or a portion of the common stock as principal, and sales may be made pursuant to any of the methods described below. These sales may be made on any securities exchange on which our common stock is then traded, in the over-the-counter market, in negotiated transactions or otherwise at prices and at terms then prevailing or at prices related to the then current market prices or at prices otherwise negotiated.

The common stock may also be sold in one or more of the following transactions:

block transactions (which may involve crosses) in which a broker-dealer may sell all or a portion of such securities as agent but may position and resell all or a portion of the block as principal to facilitate the transaction;

purchases by a broker-dealer, as principal, and resale by such broker-dealer for its own account;

a special offering, an exchange distribution or a secondary distribution in accordance with the rules promulgated by the Financial Industry Regulatory Authority Inc., or FINRA (formerly known as the National Association of Security Dealers, Inc., or the NASD), or the rules of the applicable stock exchange;

ordinary brokerage transactions and transaction in which a broker-dealer solicits purchasers;

sales at the market to or through a market maker or into an existing trading market, on an exchange or otherwise, for such securities; and

sales in other ways not involving market makers or established trading markets, including direct sales to purchasers.

In effecting sales, broker-dealers engaged by a Selling Securityholder may arrange for other broker-dealers to participate. Broker-dealers may receive commissions or other compensation from the Selling Securityholders in the

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form of commissions, discounts or concessions. Broker-dealers may also receive compensation from purchasers of the common stock for whom they act as agents or to whom they sell as principals or both. Compensation as to a particular broker-dealer will be in amounts to be negotiated. The Selling Securityholders do not expect these commissions and discounts to exceed what is customary in the type of transactions involved. No such broker-dealer will receive compensation in excess of that permitted by the FINRA Conduct Rules.

The distribution of the common stock also may be effected from time to time in one or more underwritten transactions at a fixed price or prices that may be changed, or at market prices prevailing at the time of sale, at prices related to such prevailing market prices or at negotiated prices. Any such underwritten offering may be on a best efforts or a firm commitment basis. In connection with any underwritten offering, underwriters or agents may receive compensation in the form of discounts, concessions or commissions from the Selling Securityholders or from purchasers of the common stock. Underwriters may sell the common stock to or through dealers, and such dealers may receive compensation in the form of discounts, concessions or commissions from the underwriters and/or commissions from the purchasers for whom they may act as agents.

We are not aware of any agreements, understandings or arrangements between any of the Selling Securityholders and any underwriters or broker-dealers regarding the sale of their common stock, nor are we aware of any underwriter or coordinating broker-dealer acting in connection with the proposed sale of common stock by the Selling Securityholders pursuant to this prospectus. Upon our being notified in writing by a Selling Securityholder that any material arrangement has been entered into with a broker-dealer for the sale of common stock through a block trade, special offering, exchange distribution or secondary distribution or a purchase by a broker or dealer, we will file a supplement to this prospectus pursuant to Rule 424(b) under the Securities Act, disclosing:

the names of the Selling Securityholders and of participating broker-dealer(s);

the amount of common stock involved;

the price at which the common stock is to be sold;

the commissions paid or the discounts or concessions allowed to the broker-dealer(s), where applicable;

that the broker-dealer(s) did not conduct any investigation to verify the information set out or incorporated by reference in the prospectus; and

other facts material to the transaction.

The Selling Securityholders and any underwriters, brokers-dealers or agents that participate in the distribution of the common stock may be deemed to be underwriters within the meaning of the Securities Act, and any profit on the sale of the common stock by them and any discounts, commissions or concessions received by any such underwriters, dealers or agents may be deemed to be underwriting discounts and commissions under the Securities Act. Because the Selling Securityholders may be deemed to be underwriters under the Securities Act, the Selling Securityholders will be subject to the prospectus delivery requirements of the Securities Act. The anti-manipulative provisions of Regulation M promulgated under the Exchange Act may apply to sales by the Selling Securityholders in the market.

From time to time, the Selling Securityholders may pledge their common stock pursuant to the margin provisions of a customer agreement with their brokers. Upon default by a Selling Securityholder, the broker may offer and sell such pledged common stock from time to time. Upon a sale of the common stock, the Selling Securityholders intend to comply with the prospectus delivery requirements under the Securities Act by delivering a prospectus to each purchaser in the transaction. We intend to file any amendments or other necessary documents in compliance with the Securities Act that may be required in the event the Selling Securityholders default under any customer agreement with brokers.

In order to comply with the securities laws of certain states, if applicable, the common stock may be sold only through registered or licensed broker-dealers. We have agreed to pay all expenses incident to the offering and sale of the common stock, other than commissions, discounts and fees of underwriters, broker-dealers or agents. We have agreed to indemnify the Selling Securityholders against certain losses, claims, damages, actions, liabilities, costs and expenses, including liabilities under the Securities Act.

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We or the Selling Securityholders may have agreements with the participating broker-dealers to indemnify them against certain civil liabilities, including liabilities under the Securities Act, or to contribute with respect to payments which the participating broker-dealers may be required to make.

In connection with an offering, any participating broker-dealer may purchase and sell common stock 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 participating broker-dealer of a greater number of shares than it owns or is required to purchase in an offering. Stabilizing transactions consist of certain bids or purchases made for the purpose of preventing or retarding a decline in the market price of the common stock while an offering is in progress.

The participating broker-dealers also may impose a penalty bid. This occurs when a particular broker-dealer repays to the others a portion of the underwriting discount or other concession received by it because the broker-dealers have repurchased shares sold by or for the account of that broker-dealer in stabilizing or short-covering transactions.

These activities by the participating broker-dealers may stabilize, maintain or otherwise affect the market price of our common stock. As a result, the price of the common stock may be higher than the price that otherwise might exist in the open market. If these activities are commenced, they may be discontinued by the participating broker-dealers at any time. These transactions may be effected on the OTC Bulletin Board or any other exchange or automated quotation system, if the common stock is listed on that exchange or admitted for trading on that automated quotation system, or in the over-the-counter market or otherwise.

In addition, any shares covered by this prospectus that qualify for sale pursuant to Rule 144 under the Securities Act may be sold under Rule 144 rather than pursuant to this prospectus.

LEGAL MATTERS

Certain legal matters in connection with the offering and the validity of the shares of common stock offered by this prospectus will be passed upon for us by Greenberg Traurig, LLP.

EXPERTS

The consolidated balance sheets of InVivo Therapeutics Holdings Corp. as of December 31, 2011 and 2010, 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, 2011 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

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.

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INCORPORATION 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. Information contained in this prospectus and information that we file with the SEC in the future and incorporate by reference in this prospectus will automatically update and supersede this information. We incorporate by reference the documents listed below and any 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 filing the initial registration statement and prior to the effectiveness of the registration statement, and after the date of the prospectus and before the sale of all the securities covered by this prospectus:

our Annual Report on Form 10-K for the fiscal year ended December 31, 2011, filed on March 15, 2012;

Our Current Reports on Form 8-K filed on January 18, February 17, March 8, March 23, April 6 and April 12, 2012; and

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

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 Broadway, 14th Floor

Cambridge, Massachusetts 02142

Attn: Investor Relations

(617) 475-1520

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INVIVO THERAPEUTICS HOLDINGS CORP.

26,047,200 Shares of Common Stock

PROSPECTUS

April 23, 2012